CAT NEWS

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Cover: Asiatic cheetah Acinonyx jubatus venaticus in captivity, Tehran
Photo: Hormoz Asadi (see page 2)
To Save the Asiatic Cheetah

The plight of the Asiatic cheetah has long been a matter of grave concern for the Cat Specialist Group. Once ranging from Arabia to India, it is known to survive only in Iran, and there only in a small, scattered population around the great desert of Dasht-I-Kavir. Although Iran was a leading country in wildlife conservation in the 1970s, the Islamic government which came into power in 1978 has had other priorities. But, last year, an Iranian biologist, Hormoz Asadi, returned to Iran after a long absence and opened discussions which led to an agreement on cooperation between the Department of Environment, the Cat Specialist Group and Gutenberg University, Mainz, Germany, for promotion of biodiversity, and especially to save the cheetah (see p. 2). The agreement offers a great opportunity to assist Iran in nature conservation, and, as I found during a visit to Tehran in January, officials and other conservationists are eager for collaboration.

With only 50-100 cheetahs estimated to survive by Asadi, the programme represents a great challenge. Asadi will continue research on the cheetah, which he began a year ago. This will involve plotting the distribution and estimating the numbers of the surviving cheetahs, leading to recommendations for conservation measures. Of crucial importance is the rebuilding of gazelle populations, which form the main prey of cheetahs, and we hope for collaboration with the Antelope Specialist Group. Human issues are also important, for livestock owners fear cheetah predation, and see gazelles as competitors for grazing, while they are also hunted for meat. Therefore, we propose to work with an Iranian NGO, the Society for Sustainable Development CENESTA, which is headed by Toghi Farvar, a former staff member at IUCN headquarters. Cheetah specialists who are members of the Cat Specialist Group will also be involved.

Tigers

The spate of poisoning of tigers and leopards in India (p. 3) is a matter of concern, but not a new one. It is understandable that livestock owners, particularly those with only a few animals, as is often the case in India, wish to eradicate a predator which threatens their livelihood. Monetary compensation is an obvious way of helping them and encouraging them not to kill the big cats. But official compensation schemes have not been very effective in the past because of administrative difficulties, which frequently discourage farmers from pursuing claims. Some NGOs have stepped into the breach and are doing their best to ensure quick settlement of valid claims. Unfortunately, poachers supplying the illegal bone trade encourage poisoning, and often supply the material to livestock owners, who, in any case, have easy access to agricultural pesticides supplied to boost food production.

Palamau Tiger Reserve was the scene of a tragedy (p.3). Two family members who were hunting tigers were blown up by a landmine obviously intended for the Field Director. Because they were employed on a daily basis, neither family is entitled to compensation from the government – furthermore the men had not been paid for 10 months because the Forest Department was said to be short of funds. The Wildlife Protection Society of India has stepped in to collect donations for the families. The children of one of the men had already lost their mother to snake bite.

Palamau is only one of several reserves whose forests are infested with armed insurgents, who frequently make proper management impossible. They claim to be supporting poor tribal people and villagers against the authorities, but are often colluding with timber smugglers and tiger poachers.

The growing collaboration between the Russian and American tiger workers with neighbouring China and now North Korea (p. 5-6) is heartening. There seem to be few tigers left in those countries, and prey is scarce, but they should not be written off.

Snow leopards

Snow leopard conservationists seem to be succeeding in encouraging at least some villagers to stop automatic killing of predatory cats (p.12). In northern Pakistan, a snow leopard which had killed some goats was handed over to WWF Pakistan for release elsewhere. It is reminiscent of an incident in Buxa, in India, where the young son of a woman who found a largish cat in their bathroom recognized it as a clouded leopard and called the Forest Department, which took it back to the forest.

Paul Leyhausen

The death of Paul Leyhausen is a sad blow for the Cat Specialist Group. He was the Founder Chairman and, as recorded in the obituary (p. 23), was a major force as a scientist and conservationist. Our condolences go to his wife and collaborator, Barbara.
Asiatic Cheetah in Iran

An agreement for co-operation to investigate the status of the critically endangered Asiatic cheetah Acinonyx jubatus venaticus and to prepare conservation measures has been reached between the Department of Environment of Iran, the IUCN/SSC Cat Specialist Group, and the Institute of Zoology of Gutenberg University, Mainz, Germany. Detailed surveys to map the distribution of cheetahs and associated wildlife, especially gazelles, and to assess the status of wild habitats are about to start, leading to recommendations to the Department of Environment for conservation of the cheetah as part of the country’s biodiversity. An educational and public awareness campaign, based on the cheetah, but encompassing the need for environmental conservation for the benefit of people, will be carried out.

The Asiatic cheetah once ranged from Arabia to the Indian subcontinent, through Iran, central Asia, and Afghanistan. In Iran and the subcontinent, it was numerous. Cheetahs were easy to train, and rulers kept huge numbers for hunting gazelles. The Moghul Emperor of India, Akbar, is said to have had 1,000 at a time. It appears in many Persian and Indian miniature paintings. But by 1900 it was already headed for extinction in many areas. The last physical evidence of cheetahs in India was three shot (with two bullocks) by the Maharajah of Surguja in 1947 in eastern Madhya Pradesh. By 1990, cheetahs appeared to survive only in Iran. Estimated to number over 200 during the 1970s, current estimates by Iranian biologist Hormoz Asadi put the number at 50-100 (Asadi, 1998).

Iran had an active wildlife conservation programme in the 1970s, but, following the Islamic Revolution in 1978, reserves were invaded by livestock, which overgrazed the land, while both cheetahs and their principal prey, gazelles, were ruthlessly hunted, resulting in a rapid decline. As a result, the Asiatic cheetah is now listed as Critically Endangered in the IUCN Red List of Threatened Animals (1996).

Initial surveys in the latter half of 1997 show that urgent action is required to rehabilitate wildlife populations, especially gazelles, and their habitat if the cheetah is to survive (Asadi, 1998).

As a top predator, at the peak of food chains, the cheetah serves as a flagship for conservation efforts beneficial for biodiversity throughout its range. The project is scheduled to last three years. Funds are being sought to provide for equipment, including two four-wheel drive vehicles and running costs, field equipment, (such as binoculars, telescope, night-viewer, camera, laptop computer), travel, communications, accommodation and food, and salaries for the principal investigator and assistants.

Visit to Iran

When I visited Tehran in January, officials showed eagerness for foreign collaboration. I was taken to the Kavir National Park (609,000 ha.) 3-4 hours drive south of Tehran, where we lodged in a 500-year-old caravanserai, prepared for modern visitors, near the foot of the Siah Kuh (Black Mountains). There is a second, smaller, caravanserai for women, at a respectable distance from the main one.

We spent three hours driving during the night with spotlights, but saw only one fox, probably Rüppel’s fox Vulpes rüppeli. There were no hares Lepus capensis, which are known cheetah prey, or other wildlife.

In the morning, the Sia Kuh filled the southern horizon, streaked with snow. The foothills were of many colours, from dull white to reds and greens. The stony plain was covered with knee-high artemisia bushes. We drove to the foot of the mountains, where there was a stream used by wild sheep Ovis orientalis and goats Capra aegagrus, which are taken by cheetahs. I thought that might be because of the few gazelles, but was told they were normal cheetah prey in Iran. The area was filled with tall phragmites, sere with the winter season. Except for a speck on a high slope which was said to be an ibex Capra ibex, there was no life to be seen. However, we came upon some animal tracks. They could have been left by a cheetah, but we decided that they were more probably made by a wolf.

The chief park official, Miran Zade, said he reckoned the park might hold about 14 cheetahs. The thousands of gazelles which used to be found there, and provided cheetahs with their main food, were nearly all gone because of poaching. The cheetahs frequent the rocky lower slopes of the Siah Kuh, where they feed on wild sheep. Miran Zade recounted a surprising record of surplus killing, perhaps the first involving cheetah. One day he spotted two cheetahs lying on a ledge over a stream with steep sides. When they moved away he went to the spot and found 14 wild sheep lying dead below. Some had been partially eaten, but most had only canine teeth marks on the throat where the cheetahs had throttled them. The narrow gorge probably penned in the sheep, which panicked when the cheetahs made their first attack, leading to the frenzied killing.

Some mountain goats were seen, though very distant and high up as they climbed to a ridge. At another place, Miran drew attention to some distant specks which he said were gazelles, either goitred Gazella subgutturosa or dorcas G. dorcas.

A flock of pintail sandgrouse Pterocles alchata, a pair of ravens Corvus corax and an unidentified finch were the only birds seen.

Captive cheetah

In Tehran, the Department has a young female cheetah, taken as a cub in Yazd when her mother was killed by local people in 1995. She has an extensive enclosure (much of it covered with snow when I was there) and appeared to be in excellent health. She is being fed live rabbits, although they provide no substitute for the exercise she would get chasing hares in the wild. However, when offered a rabbit in my presence, she twittered and raced to grab it, after which she raced round and round the enclosure with it in her mouth before settling down to eat.

It was interesting to see a cheetah in the snow. In the wild in Iran, they endure temperatures from well below 0°C in winter to 45°C in mid-summer.

Hormoz Asadi has been observing her behaviour and has prepared a draft report (Asadi, 1997).

Conclusion

The cheetah in Iran has to be viewed in the broad scene of the natural environment and its wildlife. There has been extensive deterioration of habitat through over-grazing by livestock. A million licensed guns, for which hunters are given 300 rounds a year, plus a probable two million more illegally
Poisoning of Tigers and Leopards in India

Increased numbers of tigers and leopards are being poisoned in India by farmers because of loss, or fears of potential loss of livestock, according to the Wildlife Protection Society of India (WPSI).

Absence of, or delays in, payment of compensation for losses is much to blame, the WPSI said.

"As populations of both people and cattle increase around tiger habitats this problem can only escalate. In fact, the hostility of livestock owners may turn out to be an even bigger threat to the tiger than the trade in tiger parts," said Belinda Wright, WPSI's Executive Director.

Tigers and leopards are usually poisoned by widely-available agricultural pesticides put into the carcasses of livestock they have killed.

Last year, a tiger which had taken up residence with three large cubs in a sugarcane field near Dudhwa National Park, close to the Indo-Nepal border, killed a man and later a buffalo and some cows. Forest officials were alerted that the villagers might poison the tigers. On New Year's Eve, the tiger killed a tethered cow in the village, and dragged the carcass into the fields. Officials from Dudhwa were called to inspect the site, but before they took action all four tigers died from poisoning.

A few days earlier two tigers were poisoned when they ate from a kill near Corbett National Park, to the west of Dudhwa, while official reports said that 28 tigers had died of poisoning in the past two years in the southern State of Andhra Pradesh.

Project Tiger Director P.K. Sen was quoted in The Hindu (7 December 1997) as saying that State Chief Wildlife Wardens had reported large-scale killing of tigers outside protected areas. He said that two tigers in the Sundarbans mangrove forests has been strangled by steel wire snares.

WPSI's database records the poisoning deaths of two tigers and six leopards up to 22 April of this year. One tiger was electrocuted. Seven tigers are recorded as poisoned, while paws and claws were seized by the authorities, as well as skins and other parts of 15 leopards. These records of known deaths and seizures are reckoned to be a small proportion of the real total of deaths of tigers and leopards.

While poisoning is often done in retaliation for loss by livestock owners, illegal traders are known to use cattle as bait to attract a tiger, and to poison carcasses when they are killed in order to obtain the bones and other parts.

Tragedy in Palamau Tiger Reserve – Appeal for Help

Two employees of Palamau Tiger Reserve, Bihar, Aziz Quraishi and Sukhdeo Parahiya, lost their lives when a landmine blew up their vehicle while they were on patrol on 16 February.

S.E.H. Kazmi, the Divisional Forest Officer, who had got down from the vehicle shortly before the incident, said that Aziz was one of the best drivers in Palamau and was an expert at collecting information about timber smugglers, which led to many seizures. Sukhdeo Parahiya was an excellent tracker with an extraordinary knowledge of tigers in his beat.

Aziz was about 32 years old and had been working as a daily wage driver since 1991. He left behind five children and a young widow of 28 years.

Sukhdeo Parahiya, who was 36, had six children, who had lost their mother six months earlier when she was bitten by a snake.

Kazmi said the two lost their lives for the cause of protection of forest and wildlife. Because they were not regular government servants, their families are not entitled to government compensation or assistance.

Aziz or Sukhdeo had not been paid wages for the past ten months because the Forest Department was short of funds, according to Belinda Wright, Executive Director of the Wildlife Protection Society of India. She said the mine was specifically detonated to kill Kazmi, who fortunately got out of the vehicle shortly before the explosion. After the explosion he radioed for help, but the enforcement authorities were unwilling to go to his assistance for fear of the Naxalites (Maoist extremists who have been fighting the Indian authorities for 30 years from hide-outs in the forests). Kazmi had to walk 10 km for help, and then returned the next day (again on foot, because of landmines) to collect the scattered remains of the two bodies. Wright said that timber smugglers were protected by the Naxalites.

"Understandably, without protection support, no member of the forest staff dares to go into the field. For now, Palamau and its tigers are unprotected," she added.

APPEAL

The Wildlife Protection Society of India appeals for funds to help the families of Aziz and Sukhdeo.

Contributions can be sent to:
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wpsi.wildlife@gems.vani.net.in
Insect Ravages Forests in India’s Tiger State

An insect attack is ravaging tiger habitat covering 10,000 km² in the central Indian state of Madhya Pradesh, home to an estimated 900 tigers. Nearly 600,000 trees have been cut down amid allegations that many were not affected, but were being taken by timber companies using the epidemic as an excuse.

The insect, known as the sal borer beetle Hopocrembix spinicornis is named after the dominant tree of the area’s forests, sal Shorea robusta. P.C. Kotwal of the Indian Institute of Forest Management said that around 250-300 million rupees ($9.7-11.6 millions) worth of mature sal trees had been affected.

Although trees have been attacked in the major tiger reserve of Kanha, none has been felled there, but other forest sanctuaries have lost trees.

“The area is very good tiger habitat and felling of sal trees en masse is likely to affect predator and prey systems,” said Kotwal, adding: “This is a major natural disaster affecting not only the sal trees but the entire ecosystem of the area, including biodiversity of plant and animal species, many of which are threatened.”

The Supreme Court, responding to allegations that healthy trees were being felled, ordered a halt of all tree cutting.

The central government has constituted a special body to assess the total loss and the factors related to intensification of sal borer attacks on the forests of Madhya Pradesh, which lost 300,000 trees in a similar epidemic in 1928-29.

Only Disturbance-free, Well-managed Habitats Can Save the Tiger

It is well known that tigers Panthera tigris prefer disturbance-free habitats, and this is due to the fact that the large cat needs considerable amount of undisturbed time to hunt and consume its prey, and to raise its progeny. Besides, only suitable undisturbed habitats have higher densities of its preferred large ungulate prey (e.g. sambar Cervus unicolor). The intensity of disturbance (cattle grazing, wood cutting, developmental projects and unregulated tourism pilgrimages and poaching) varies from habitat to habitat. Most of the disturbance, which persists throughout the year, stems from human settlements which are inside the tiger habitat, as well as on its periphery. Often, people living in such remote settlements, where medical, school and road facilities are not available, are willing to move out to ensure better prospects for themselves, as well as for their progeny. Such people could be relocated with proper compensation and adequate post-shifting care, so that they can face the world without much hardship, and more disturbance-free habitats can be secured for the tiger. With reference to two tiger habitats in India, we explain the need and the feasibility of creating more disturbance-free habitat for the tiger.

Corbett Tiger Reserve (1,400 km²), in the State of Uttar Pradesh, and the surrounding forests form a contiguous habitat of ca. 2,000 km², which has the potential to support about 100 adult tigers. This tract has nearly 200 Gujar (a pastoral tribe) families living in the heart of the tiger habitat, spread over an area of about 300 km². Their lifestyle, which involves grazing large numbers of buffaloes, lopping trees to feed the buffaloes, and using enormous quantities of firewood to keep their homes warm in winter, is not compatible with tiger conservation.

Mudumalai Wildlife Sanctuary (310 km²), in the State of Tamil Nadu, is part of ca. 3,000 km² excellent tiger habitat in south India. This stretch, with proper management, could easily support 200 adult tigers. But it has a population of 2,000 Montad Chetties (200 families) who live in six settlements. Although the settlements occupy only about 5 km² of marshy area, an excellent summer abode for elephant Elephas maximus, gaur Bos gaurus, sambar, and wild pig Sus scrofa, their impact spreads over 80-100 km² of prime wildlife habitat. The Chetties grow paddy in the marshy areas, and the crop is often raided by elephants and pigs. The livestock of both the Chetties and the Gujaris frequently get killed by tigers and leopards Panthera pardus.

If suitable alternatives are given, both the communities are willing to move out, as they have numerous problems related to the sale of their products, education of their children, and medical aid. Sufficient Reserve Forest land, which faces an ever-growing threat of encroachment, is still available to resettle the people living in areas adjacent to both Corbett Tiger Reserve and Mudumalai Wildlife Sanctuary. We suggest that to save such quality wildlife habitats, some portion of the Reserve Forests, which are most vulnerable to encroachment, should be sacrificed for relocating people without delay.

Several such habitats, where resettlement is needed and possible, can be identified across tiger habitat in the country. The resettlement of Jhima village in April 1994 from the southern boundary of Corbett Tiger Reserve to Ampokra, where the land is fertile, the water-table high, and cattle and crops safe, is a good example of successful relocation. The translocated people now lead a contented life, and tiger and elephant signs are common in the Jhima so (river bed with springs), where till recently, 800 cattle and 500 people wandered.

We strongly suggest that resettlement of people, who are willing to move out from prime wildlife habitats, should be taken up as a national priority. This will significantly enhance the survival prospects of the tiger. India, which has half the tiger population in the world, has a duty to save the tiger for mankind, and therefore no effort should be spared.

We also plead that the spine of the tiger bone trade be broken, and premier wildlife reserves be properly patrolled. Otherwise the reserves will continue to be hide-outs for brigands, who compete with the tiger, killing a sambar a week.

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Spring 1998
Petition to Save Tiger in India's Supreme Court

A non-official member of India's Tiger Crisis Cell in the Ministry of Environment & Forests, Navin M. Raheja, has called on the government to take effective steps to stop poaching and save the tiger from becoming extinct. In a petition to the Supreme Court, Raheja alleged that on average one tiger was being poached every day and unless serious or effective measures were taken the tiger might become extinct in India in the next few years.

He said that Project Tiger had been conceived out of concern for India's dwindling wildlife but it had failed to deliver the goods. The tiger population had declined from 4,334 in 1989 to 3,750 in 1993, and, according to Raheja, the present tiger population in the wild was around only 2,500.

Raheja has called for the Centre and State Governments to take the following actions immediately to save the tiger from becoming extinct:

1. Incentives and rewards should be given to the forest staff and people occupying peripheral areas, which should not be less than the amount offered by the poachers. This amount can be raised by heavy penalties and contributions from NGOs.

2. Intelligence and information networks should be created through active support and involvement of the Home Ministry.

Copies of the petition can be obtained by sending an email addressed to: raheja@giadiol1.vsnl.net.in

Tigers and Leopards in Jilin Province, China

An international team of specialists confirmed that Amur tigers Panthera tigris altaica and Far Eastern leopards Panthera pardus orientalis still exist in the northeast Province of Jilin, China. A survey by Chinese, Russians and Americans in Yanbian Prefecture, Jilin Province, between 27 February and 18 March 1998 suggested that at least four, and as many as six tigers may have been present in Jilin Province during the 1997-1998 winter. Evidence for 4-7 Far Eastern leopards, one of the rarest of the large cats, was also found. Other reports of tigers and leopards could not be corroborated due to either time constraints, lack of snow to confirm presence of animals, or were considered unreliable.

The survey was sponsored by the UN Development Program, with support from the US Wildlife Conservation Society. A 12-member team, led by Yang Shihe and Jiang Jinsong of the Wildlife Protection Association of the Jilin Provincial Forestry Bureau, Dmitry G. Pikunov of the Russian Academy of Sciences, Institute of Geography, Vladivostok, and Dale Miquelle, of the Horocker Wildlife Institute and Wildlife Conservation Society, co-ordinated activities and are developing a joint report on the survey, available from the Tumen Secretariat, UNDP.

Results indicated that the majority of tigers and leopards were recorded close to the Russian border, and that all confirmed reports of both predators were within Hunchun County, the northeastern-most region of Jilin. The absence of persistent, repeated observations of tigers or leopards in any given locale suggests that there may be no resident animals in Jilin, i.e., all recorded observations may represent transient or dispersing animals. The exception to this generalization may be along the Russian border, where a few tigers and leopards likely maintain territories that include both countries.

The primary obstacle to an increase in populations of tigers and leopards appears to be low densities of prey populations. Tracks of red deer Cervus elaphus were found on only a few occasions; wild boar Sus scrofa densities were higher to the west in Antu County, where tigers have not been reported for many years, and sika deer Cervus japonensis were common only along the Russian border. Roe deer Capreolus capreolus densities were low but they occurred across all areas surveyed. While rae deer are suitable prey for leopards, it is unlikely that tiger populations can thrive where only rae deer occur. Evidence of hares Lepus manchuricus and badgers Meles meles, suitable prey for leopards, were also scarce.

Therefore the highest priority for recovery of tiger and leopard populations is the recovery of prey populations. Hunting has already been banned by the Provincial government, which is an important first step, but by itself is probably insufficient for recovery of prey populations. Wire neck snares were scattered throughout the region surveyed, and are likely depressing prey populations, as well as killing both tigers and leopards. Researchers encountered an average two snares/10 km walked, and in 10% of those snares a dead ungulate was found.

Despite the dangerously low populations of tigers, leopards, and their prey, there is much reason for optimism. There remain extensive tracts of forest lands in northern Hunchun, Wangqing, and Antu Counties that are well managed by the Ministry of Forestry, and which retain the capacity to harbour good populations of prey, as well as tigers and leopards. Additionally, there appears to be a sincere desire on the part of the Wildlife Animal Protection Society and the Ministry of Forestry, as well as other branches of the government, to assist in recovery of tiger and leopard populations.

The survey report recommends development of a recovery plan for tigers and leopards that focuses on Hunchun County as a critical first step, and has, as its goal, the re-establishment of a breeding popula-
Tigers in North Korea

Newly established contact between the Institutes of Geography of the Russian Academy of Sciences Far Eastern Branch and of the Democratic People's Republic of Korea has raised hope that Amur tigers *Panthera tigris altaica* still occur in North Korea. With support from the US Wildlife Conservation Society, Dimitry Pikunov, a specialist on Amur tigers and Far Eastern leopards *Panthera pardus orientalis*, made two trips to North Korea. In February 1998, Pikunov and Anatoly Kachur (Assistant Director of the Russian Institute of Geography) travelled to North Korea to develop plans for joint survey work on tigers and leopards. The agreement called for Korean specialists to gather material during the 1998 winter to provide conclusive evidence that Amur tigers and/or Far Eastern leopards still occur within the country. If sufficient evidence justified further activities, a large-scale survey would be conducted during the 1998-1999 winter.

In April 1998, Pikunov returned to North Korea with fellow tiger biologist Igor Nikolaev to assess material collected by the Korean specialists, and to visit potential survey sites. While a final report is not available, evidence suggests that some tigers may still survive in the northern reaches of the country. The Korean specialists focused their efforts on Lyangan Province, 6,000 km² in size, one of the northern-most provinces and one of the most heavily forested and most mountainous regions of the country. It includes Paektu, a massive volcanic mountain that borders China, where it is known as Changbaishan. It was estimated that at least 20% of the region contained potential tiger habitat.

Based on replies to questionnaires by local people, the Korean specialists reported evidence of tigers in all five administrative counties of Lyangan. Field efforts were hindered by lack of snow in many regions, but tracks were tentatively identified. Of 25-30 photos submitted for review, Pikunov and Nikolaev could only claim that 2-4 photos contained tracks that resembled those of tigers. However, confirmation was difficult due to poor quality photos, and poor conditions for track formation (old, thawing snow). Reports of tiger predation on livestock were not uncommon, and there have been 10 reported cases of tigers attacking people in the past five years (1992-1998).

Although some local people reported the presence of leopards, no confirmation of these reports was possible. Considering the fact that a number of Far Eastern leopards have been transported out of North Korea in recent years to foreign zoos, the absence of leopard sign is puzzling.

During two journeys into potential tiger and leopard habitat, Pikunov and Nikolaev could not confirm the presence of either cat species, but lack of snow reduced the chances of finding sign. Evidence of roe deer *Capreolus capreolus*, wild boar *Sus scrofa*, and Himalayan black bear *Ursus thibetanus* were noted, but in general prey densities appeared to be low.

Given the available evidence, it appears likely that some Amur tigers remain in North Korea. Whether these individuals represent an isolated population is still unknown. Evidence gathered in a survey of Jilin Province China (also this past winter – see adjacent article), suggests that an ecological corridor may link Russia, China, and North Korea along the Tumen River. If attempts at initiating an international survey this coming winter are successful, a primary objective will be an assessment of territory neighbouring the Tumen River on the North Korean side. Unthinkable only a few years ago, the concept of a co-ordinated, tri-country management scheme for Amur tigers and Far Eastern leopards now seems a possibility.

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Tigers in North Myanmar

Tigers in Myanmar are in dangerously low numbers, despite the fact that extensive forest remains, according to Alan Rabinowitz. The increased value and demand for tiger parts has led to even more intense poaching pressure on tigers and they have either been extirpated from many of the forest areas, or are at dangerously low numbers for future survival.

In a report in *Tigerpaper* (1998) he said the outlook for the survival of tigers in North Myanmar, bordering China, was not good. It did not appear that tigers were ever abundant, and there was no recent evidence to suggest that they still survived.

Rabinowitz, of the Wildlife Conservation Society, New York, noted that expeditions as early as 1938-39 and 1953 reported little evidence of tigers in North Myanmar. During his own survey in 1997 tiger presence in Naung Maung township between Mali Kha and the Mal Kha was reported as uncommon to non-existent (Rabinowitz and
Death of a Bali Tiger

The Bali tiger Panthera tigris balica was the smallest of the recognized eight subspecies of tiger. The last known physical evidence was one shot in 1937, but reports of sightings were received during the 1940s. No photographs of live Bali tigers appear to exist, only some strung on poles after being shot. The following account of a killing (Vojnich 1913) was reproduced in a paper by Balzas Buzas and Balzas Farkas* (1997) on a skull from Tanjung or Gunung Gondol, northwestern Bali, in the Department of Zoology, Hungarian Natural History Museum (HNHM 4250.17).

"In the western part of Bali Island, along the northern shore, in the mountains of Goendoel, we discovered tiger footprints. Munaut set up two traps along the trails in use (the tiger, like other big game, readily employs the trails of humans). Goats served as bait. On 2 November, while collecting twigs to be used for constructing a fence around the traps, the carcass of a freshly killed kijang (Muntiacus muntjac) was encountered by the people. The trap was set in front of the kijang, in a thicket. Munaut was almost certain that the tiger would be caught in another day. I was much less convinced, as the many human tracks could have warned the tiger. But no — it came to feed on the slightly smelly joint, and the trap caught one of its forelegs, just below the wrist.

"When we arrived at the site on the morning of 3 November after about an hour’s walk, and took a few steps from the coast into the thicket, we immediately heard the tiger’s roar. Then we continued along with Munaut and a sharp-eyed native hunter towards the trap, or rather approached slowly and carefully. When we came near it, and I could not figure out where the tiger that I intended to shoot in the head actually was... I definitely enjoyed the feeling of being so close to danger, but as soon as I came to see the beautiful animal wriggling in impotent rage with a huge piece of iron in its leg, I felt sorry for it.

"I did not have a good shot, but at the coaxing of the native hunter that I shoot, I aimed at the head of the roaring animal. The tiger lowered its head slightly at the moment of the shot and the right barrel did not point to its forehead, but rather lower, and the bullet destroyed the nasal bone. The tiger roared and jumped a few steps aside. Because of the dense vegetation, I had to clear the place, and shot the tiger in the forehead with the left barrel from about 15 meters. It collapsed immediately like an apoplectic.

"As I later found out, three buck-shots penetrated the frontal bone, a fourth destroyed the eye, and all four reached the brain. Does one need a better shot than this? My male tiger is thus a perfect example of the Dutch [East] Indian species. Its tail is shorter than that of the Indian form."

According to Vojnich (1913), an identical method of immobilizing and killing was customarily employed by the Surabayan rifle-maker E. Munaut, who had already brought down over 20 Bali tigers at that time. This hunter caught his tigers with steel traps weighing 16-18 kg, and subsequently gunned the handicapped animals in the head from a distance of 16-20 m.

Although shot in 1911, our specimen was not actually catalogued until 1947. Therefore, the holotype might have reached the Senckenberg Museum considerably earlier (cf. Schwarz 1913).

References


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Khaing, in press). However, a single tiger was reported killed around the village of Rabaw in 1993. After crossing the Mai Kha River at Pangnandim, no tigers were reported and no evidence of tigers was seen up to the snow line. A hunter from Guba village reported stories of tigers from his grandfather’s time. Surveys in the Gaoligongshan region along the Myanmar-China border found no evidence of tigers (Ma et al., 1994).

References


Threatening Himalayan Dam Project Dropped?

Doubts have arisen about the future of a huge dam project on Nepal’s Karnali river, which conservationists say threatens one of the country’s principal wildlife areas. A government official said that the US corporation Enron had withdrawn its application to build a hydro-electric project involving an investment of up to $6 billion (Reuters, 1998).

The dam on the Karnali, which drains a large area in the world’s highest mountains, was planned to produce 10,800 megawatts of hydropower for export to India and China. India, especially, is gravely short of power for industrial development, while China needs power for development of its Tibetan region. Enron proposed to build the dam and transmission lines to Tibet across the Himalayas.

However, a few days later, Prime Minister Girja Prasad Koirala said that Enron was still considering returning to the project (Anon., 1998). He said he had a fax from Enron expressing willingness again to carry out the project.

An Enron spokesman said the company had pulled out because of uncertainty about selling a large block of power outside Nepal. But analysts said the withdrawal was due to unstable politics in Nepal, which has had five changes of government in three years, and the slowness of previous governments to make decisions on the project.

In 1995, the World Bank dropped plans to lend $175 million for a hydropower project on the Arun, another of Nepal’s great Himalayan rivers. It said Nepal should focus on smaller power plants on its many rivers.

As the Karnali drops to the lowland terai region of Nepal and flows on to India to join the Ganges, it passes through the western end of the Bardia National Park, which holds the second largest tiger population in Nepal, as well as great one-horned rhinos Rhi-nozeros unicornis and a host of other wildlife. Conservationists say that construction work, necessitating a huge labour force and earth-moving, with a network of roads, would prove near fatal for this important wildlife area.

References

Crackdown on Trade in Tiger and Rhino Parts in USA

Any product in the USA claimed to contain tiger or rhino products will be illegal, and violators will be subject to up to $25,000 in fines and one year in prison under legislation approved by the House of Representatives by voice vote on 28 April.

The legislation, which now goes to the Senate for approval, allows inspectors to seize any product labelled as containing rhino or tiger parts without performing DNA tests to verify the contents.

The bill’s sponsor, Representative Jim Saxton (Republican-New Jersey), said there were “thousands of prepackaged Oriental medicines sitting on pharmacy shelves throughout America with labels indicating they contain parts of rhinos and tigers.”

The Clinton Administration earlier threw its support behind the legislation. Secretary of the Interior Bruce Babbitt said: “The United States will do its utmost to ensure that the next commemoration of the Year of the Tiger (in 2010) is a celebration and not a wake. This legislation will have the full support of the Administration and, if enacted, will add to other efforts to assist our international partners in rhino and tiger conservation. This country will use every tool it has to help save the world’s wild rhino and tiger populations from extinction due to illegal trade and habitat loss.”

Tigers and rhinos are protected under the U.S. Endangered Species Act and by international treaties, but trade in their parts continues to flourish, particularly for Asian traditional medicines.

Wildlife inspectors all over the USA routinely find shipments containing wildlife products labelled as containing protected species parts, especially of rhino and tiger. Once these mass-produced products reach the United States, even when labelled as containing rhino or tiger parts, the legal burden of proof falls on the Service to demonstrate scientifically whether the products actually contain what the labels say. According to the Service’s forensic experts, it is a very time-consuming and costly process to develop a DNA analysis test to identify any particular group of wildlife, such as all rhinos or all tigers. Given this situation, seized items must often be returned to the importer because it is not possible to show any violation of any existing U.S. law, such as the Endangered Species Act or the Lacey Act. In addition, because enforcement is so difficult, these products are easily found for sale.

Babbitt declared: “These products, whether or not they actually contain rhino or tiger parts, stimulate demand and feed the market that makes these critically endangered animals more valuable dead than alive.”

The U.S. Fish and Wildlife Service, the Federal agency charged with implementing the Rhinoceros and Tiger Conservation Act, is assisting rhino and tiger range states with expanded on-the-ground conservation efforts. Domestically, the Service has been working in partnership with local Asian communities to develop educational materials to address the thriving illegal trade in traditional oriental medicines purported to contain tiger or rhino parts and its impact on wild populations.

Babbitt said he was encouraged to report that, thanks to appropriations provided by the U.S. Congress for the Rhinoceros and Tiger Conservation Fund, range countries in Africa and Asia were reporting progress in their efforts to combat the forces responsible for the absolutely desperate state of these species due to habitat degradation and the illegal trade.

It is thought that there are no more than 5,000 to 7,500 tigers left in the wild. The total population of all three Asian rhino species is less than half the number of tigers.
Year of the Tiger Conference

Tiger specialists from 13 of the 14 range countries gathered in Dallas, Texas, in February to mark the Chinese Year of the Tiger with an intense effort to improve their collaboration to save the tiger from extinction.

The conference was sponsored and funded by Exxon Corporation, which has pledged $5,000,000 for a Save the Tiger Fund (STF) over five years, marking its long use of the tiger as an advertising symbol. At the opening session, Exxon Chairman Lee Raymond announced a further $1,000,000 donation for 1998.

John Seidensticker, Chairman of the STF Council, pointed out the endangered tiger was an indicator of ecosystems in crisis, and attention must be directed to the tiger’s long-term future and support sustainable ecosystems and landscapes.

"Many of the remaining tiger habitats are also critical watershed protection areas and the long-term sustainable management of these areas is essential for all those who live downstream," he declared.

There was a widespread consensus that saving the tiger could only be accomplished through a series of partnerships and depended on the people who lived with and near tigers every day.

"It is those people who pay the highest price and who must be convinced that saving the tiger is worth their while. Otherwise wild tigers will not survive," he said.

M.K. Ranjitshin, Head of the WWF Tiger Conservation Programme, said the five basic needs in tiger conservation were men, money, political support, prey and living space. Manpower was the most important — "dedicated, skilled men in the field who are prepared to risk all for the tiger".

Political support, he said, had become another casualty of democracy. It required statesmanship and a high commitment to the cause of nature conservation to risk votes in order to save endangered species.

Describing wildlife trade as much like narcotics — where was a demand there would be a supply — he said that whenever was done in Asia to stop it, tigers would be killed as long as there was a demand. He appealed to well-wishers of the tiger to keep their dollars to clear the streets of New York, Vancouver, Toronto, San Francisco, Taipei and Shanghai of tiger bone junkies. Conservation of the tiger in the 21st century was the responsibility of every citizen of both the range states as well as the consuming states.

Alan Rabinowitz of the Wildlife Conservation Society called for agreement that, while people and the human-dominated landscape must be a part of the overall picture of tiger conservation, the real needs of the tigers must come first in the highest priority areas if tigers were to saved in the future.

Two of the three days of the conference were devoted to workshops examining wildlife research and monitoring; landscape planning and management; country and international issues; local issues; human-tiger conflict; traditional East Asian medicine; and financial support and networking, followed by sessions for regional groups from South Asia, South-East Asia and East Asia.

In his concluding remarks, Seidensticker summed up what had emerged from the de-

and the African black rhino has suffered a 90-percent reduction since the 1960s. All populations of both species are protected under the U.S. Endangered Species Act and by the Convention on International Trade in Endangered Species (CITES).

Congress passed the Rhinoceros and Tiger Conservation Act in 1994. The Act provides money to fund projects that will enhance sustainable development programs to provide effective long-term rhino and tiger conservation. Congress authorized funding for the Act through the year 2000. In 1996, Congress appropriated $200,000 for these grants, $400,000 in 1997, and another $400,000 in 1998, and the same amount is requested in the President’s 1999 budget proposal.

To date, 30 projects in 10 range countries have been awarded some $582,000 under the Rhinoceros and Tiger Conservation Fund. This money has been tripled by matching funds, provided in most cases by the grant recipients, bringing the total to almost $1.9 million. Half the money has gone to support law enforcement programs. In addition, nine grants were awarded to range country governments with an equal number going to range country non-governmental organizations. A total of 12 grants went to international non-governmental organizations.
WWF/IUCN Tiger Emergency Fund

Despite major efforts by range states and their conservation partners, aimed at reinforcing the protection of tiger populations, the species is still on the decline mainly because of the extreme pressures from the loss of its habitat and the trade in tiger parts for traditional Chinese medicines. WWF has selected the tiger as one of the three flagship species under its Living Planet Campaign, and is funding a large portfolio of tiger projects. IUCN has been involved in tiger conservation for many years mainly through the technical input from its Cat Specialist Group. The need to create a Tiger Emergency Fund has been identified by many conservation organizations as a very high priority. WWF's Year for the Tiger campaign, linked to the traditional Chinese Year of the Tiger 1998-1999, offers the opportunity to set up this Fund. WWF and IUCN/SSC agreed to work together and combine both organizations' skills and resources in the management of this Fund.

Conditions for Applications
The following selection criteria and conditions of acceptability of the applications submitted to the Fund will be observed:
1. applications must emanate from a tiger range state;
2. applications from individuals, local groups or NGOs must be endorsed in writing by a relevant national wildlife authority and by either WWF's local National Organization, or the local WWF or IUCN Programme Office. Applications from a WWF or IUCN project must be endorsed by the Head of the local National Organization or Programme Office;
3. applications from local wildlife or protected areas management authorities must be endorsed by the relevant hierarchical officer in their administration;
4. if applications are not routed through the above-mentioned channels, they will be returned to the applicant;
5. consideration will only be given to applications for field emergencies directly related to tiger protection (such as a sudden need for a key piece of equipment or a spare part, an urgent management operation, an urgent need for technical support, etc.). The Fund's Committee will finally judge each application on its own merits;
6. funds must be requested for one-off expenditures and not for recurrent expenses;
7. the amount of funding requested per application must not be higher than US$10,000;
8. applications should be short (max. four pages), well structured, and to the point. They must be clearly stated the relation between the urgent need of the support requested from the Fund and the threat to the local tiger population. They must include the relevant information, such as identity, function and activities of the applicant, full address, bank account, etc., and supporting documentation (map, quotations for equipment, local endorsements, etc.);
9. once funds are received, the applicant has a maximum of two months to implement necessary actions and submit the final progress and financial report.

Management of the Fund
1. The Fund will be managed by a Committee composed of three Members representing IUCN/SSC Cat Specialist Group, and WWF International's Asia/Pacific Programme and Species Conservation Unit.
2. The Committee will be activated as soon as decisions have to be made on valid applications.
3. The entire process of proposals screening and approval/rejection will not take more than five working days.
4. Whenever feasible and appropriate, the process of disbursement of funds will be shortened by requesting the local WWF or IUCN Office to advance the amount of the grant.
5. The Fund's Management Committee, in consultation with the Head of the local WWF or IUCN representation in the applicant's country/region, may organize a field visit to assess the use of the grant received and its utilization.

Florida Panther’s Bleak Future
Despite a 20-year effort to give the critically-endangered Florida panther Puma concolor coryi a new lease of life, its future remains bleak. Specialists who met in Gainesville on 1 April considered that the cat can probably never be removed from the list of endangered species, even if the goal of establishing three separate viable populations, with at least 50 adults in each, is achieved.

Shortly afterwards, on 20 April, a “Florida panther” was found shot dead in Collier County. But it was actually a Texas cougar P. c. cougar, one of several released in south Florida to boost the genetics of the panther. Both subspecies are protected by law and a $5,000 reward has been announced for information leading to the killer.

About 50 adult panthers plus some kittens are thought to survive in the Everglades and some other reserves in southern Florida, and desperate efforts to save the subspecies from extinction have been made for the past two decades. Killing one can mean a $5,000 fine and five years' imprisonment. The last known shooting of a panther was in Palm Beach County in 1986.

The dead Texas cougar – one of eight females brought into Florida three years ago to restock the Florida panthers' gene pool – was on private property about 3.5 miles east of Naples and south of a highway known as Alligator Alley. The animal had a radio collar, which led to its discovery by wildlife officers carrying out routine aerial monitoring. The signal, picked up at intervals, indicated that the animal was not moving, and it

Spring 1998
## Current Status of the Tiger

Table compiled by Peter Jackson, Chairman, Cat Specialist Group, World Conservation Union (IUCN) from reports from range countries. Most estimates are educated guesses, but censuses in Nepal and Russia provided more reliable numbers.

<table>
<thead>
<tr>
<th>Tiger sub-species</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bengal (Indian) tiger <em>P. tigris</em> (Linnaeus 1758)</td>
<td>3,159</td>
<td>4,715</td>
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</tr>
<tr>
<td>Bangladesh</td>
<td>382</td>
<td>362</td>
<td>1</td>
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<tr>
<td>Bhutan</td>
<td>50</td>
<td>240</td>
<td>2a,b</td>
</tr>
<tr>
<td>China</td>
<td>30</td>
<td>35</td>
<td>3</td>
</tr>
<tr>
<td>India</td>
<td>2,500</td>
<td>3,750</td>
<td>4a,b</td>
</tr>
<tr>
<td>Myanmar, Western</td>
<td>124</td>
<td>231</td>
<td>5</td>
</tr>
<tr>
<td>Nepal (*)</td>
<td>93 (adults)</td>
<td>97 (adults)</td>
<td>6</td>
</tr>
<tr>
<td>Caspian (Turán/Hyrkanian) tiger <em>P. virgata</em> (Illiger 1815)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formerly Afghanistan, Iran, Chinese and Russian Turkistan, Turkey</td>
<td></td>
<td></td>
<td>Extinct 1970s</td>
</tr>
<tr>
<td>Amur (Siberian/Ussuri/Manchurian)/North-East China tiger <em>P. altaica</em> (Temminck 1844)</td>
<td></td>
<td></td>
<td>360</td>
</tr>
<tr>
<td>China</td>
<td>30</td>
<td>35</td>
<td>3</td>
</tr>
<tr>
<td>Korea (North)</td>
<td>&lt;10</td>
<td>&lt;10</td>
<td>7</td>
</tr>
<tr>
<td>Russia (*)</td>
<td>330 (adults)</td>
<td>371 (adults)</td>
<td>8</td>
</tr>
<tr>
<td>Javan tiger <em>P. sondaica</em> (Temminck 1844)</td>
<td>Extinct 1980s</td>
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<td></td>
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<tr>
<td>South China (Amoy) tiger <em>P. amoyensis</em> (Hilzheimer 1905)</td>
<td></td>
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<td>Bali tiger <em>P. balica</em> (Schwarz 1912)</td>
<td>Extinct 1940s</td>
<td></td>
<td></td>
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<tr>
<td>Sumatran tiger <em>P. sumatrae</em> (Pocock 1929)</td>
<td>400</td>
<td>500</td>
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<tr>
<td>Indo-Chinese tiger <em>P. corbetti</em> (Mazák 1968)</td>
<td>1,227</td>
<td>1,785</td>
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<tr>
<td>Cambodia</td>
<td>150</td>
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<tr>
<td>China</td>
<td>30</td>
<td>40</td>
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<tr>
<td>Laos</td>
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<td>491</td>
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<tr>
<td>Thailand</td>
<td>250</td>
<td>501</td>
<td>12a,b</td>
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<tr>
<td>Vietnam</td>
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<td>200</td>
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<tr>
<td><strong>Totals</strong></td>
<td>5,166</td>
<td>7,436</td>
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<tr>
<td><strong>Rounded totals (nearest 500)</strong></td>
<td>5,000</td>
<td>7,500</td>
<td></td>
</tr>
</tbody>
</table>

(*) Figures for Nepal and Russia are for adult tigers counted. Scientists consider such figures more realistic because many cubs do not survive to maturity.

Dennis Jordan, who is in charge of the U.S. Fish and Wildlife Service's panther recovery program was reported by the Orlando Sentinel (2 April) as stating that the Texas cougar experiment was working, but it would be impossible to leave the animals alone. A 1989 genetic analysis showed there must be 500 reproducing adults before the panther had a good chance at surviving on its own. Although the panther historically ranged throughout the southeast, there was not enough undeveloped habitat left to support that many animals, Jordan said.

### Sources

Villagers Save Predatory Snow Leopard

A young snow leopard, captured by villagers in northern Pakistan while attacking their goats was saved by them and released elsewhere in the wild.

Basit Khan of WWF Pakistan recounts what happened: “On 11 April, a female snow leopard attacked a herd of 20-25 goats. When the herders working in the nearby fields saw the goats running in chaos, they approached the site and found that the snow leopard had injured two of their goats and was entangled in a tussle with another one. One of the owners struck the snow leopard with a stick, making her partially unconscious. He then wrapped his jacket around the snow leopard’s head until his brother arrived and grabbed her tail, rendering her helpless. By this time, other villagers arrived and tied the snow leopard with a rope and brought her to the village in a wheelbarrow.

“Two days later, WWF-Gilgit was informed about the incident and rushed a team to the site where the snow leopard was being kept in a make-shift cage. The snow leopard was being fed with the meat of the goats she killed and given some water, but she was terrified. With no dart gun available or any other option to make her unconscious, we inspected her visually with the help of a vet-erinary doctor, and decided that she was fit enough to be released at a proper location.

“With the supervision of the local administration the snow leopard was released on 15 April in the Khunjerab National Park Buffer Zone, approximately 15 km. from the place she was caught. She was released under a ridge on which a few ibex could be seen. There was a gathering of 30-40 villagers who were jubilant at the release.”

Basit Khan said that leopard sightings had substantially increased in the Northern Areas during the last few years as compared to other regions in Pakistan, and very focused conservation efforts on snow leopard were needed there.

Rodney Jackson, Director of Science at the US-based International Snow Leopard Trust, said that the cat was young and he doubted that it was independent of its mother – “I think she may have killed the first goat, then fled unseen, leaving the young cub behind, when the herder arrived.”

He added that the incident provided a unique opportunity to educate villagers and further their conservation activities.

Snow Leopard Along the Border of Russia and Mongolia

The snow leopard population in its northern range is characterized by an island-type distribution. Many groups in Siberia, Mongolia, and also northern China and northeastern Kazakhstan are separated by hundreds of kilometres of taiga, deep winter snow, and deserts. The zone of death here is significantly larger than the zone of life, and the survival of the population on the whole depends on conserving separate “cores” and the possibility for their spatial contact. But it is surprising that, even in the most extreme conditions, the snow leopard not only retains many parts of its range where it was recorded 100-200 years ago (Pallas, 1811; Radde, 1861; Przewalski, 1875), but has also appeared in regions where it was not known earlier.

The least understood fact of survival of the snow leopard is in the isolated mountains of In-Shan and Taikhan-Shan in China (Czhuboi-Pin, quoted by A.A. Sludsky, 1973; Wang Zong-Yi & Wang Sung, 1986; Schaller et al., 1988) and also in a series of regions in southern Siberia. The In-Shan and Taikhan-Shan Mountains situated to the south and southeast of the Gobi, are divided from the main part of the range of the snow leopard (Nowell and Jackson, 1996) and no one has explained how the snow leopard has populated these areas. Incursions of the snow leopard in Kuznetsk-Altai, Kansk Belogorye, and Transbaikal in the most northern and western parts of its range (Matyushkin, 1981; Baranov, Boiko, 1988; Smirnov et al., 1990; Zavatskii, 1988; Bologov et al., 1996; Kochkarev, 1997; Kochkarev, unpublished data) are also located within the frame established by V.G. Heptner (Heptner and Sludsky, 1972), the most widely accepted area of species distribution. The apparent spatial isolation of the Transbaikal part of the range (Russia) from neighbouring herds can also exceed 800 km. This surpasses in magnitude the largest break, Dzungarian-Gobi, which divides the range of snow leopard into two gigantic sections – Siberian-Mongolian and Himalayan-Tibetan.

An even bigger surprise has been incursions over recent years into Siberian regions of northern and western Transbaikal. The snow leopard was found here in the winter of 1976/77 in the southern Muiski Mountains (tracks of one animal were found: my unpublished questionnaire data), winter 1992/93 – in Kodar Mountains (one animal was killed: Bologov et al., 1996), in February of 1997 – in the Ulan-Burgasy Mountains (one animal was seen: my unpublished questionnaire data). In Ulan-Burgasy, the snow leopard was even encountered 40 years ago.

The length of new incursions of the snow leopard are amazing, even for the nearest borders of range, where continual presence of the snow leopard is not yet demonstrable. The Ulan-Burgasy Mountains are located 400 km. from Khentii Chikoiisky uplands, and 500 km. from Eastern Sayan Kodar Range – corresponding 800 and 1,200 km. Such unusual incursions may be unbelievable, but the coincidence of four factual encounters with the animal in one region cannot be accidental or a mistake. It is more apparent that the ability of the snow leopard to adapt to extreme conditions is higher than imagined. The species extends into the north much further than its basic prey species, mountain goat Capra sibirica is accustomed to in the Central Asian landscape.

From contemporary data, reliably describing distance travel of the snow leopard, only the data of Tom McCarthy in the Gobi Altai is well-known. Here the animal, followed with the help of a radio collar and satellite, freely crossed desert between separate mountain massifs. The maximum distance of a traverse across desert was 60 km, and most commonly 40 km. (Tom McCarthy, 1997, pers. comm.).
Eastern Sayan (Buryatia, Russia)

In February and March, the western and central parts of Tunkinskii Mountains were surveyed. The tracks of six snow leopards were found—four on the northern slopes and two on the southern. With the exception of a female with cubs (northern slopes), all tracks were of solitary individuals.

At a distance of 7-8 kilometres (according to a straight line on the map) from the female and the cubs on the same day the tracks of another individual were found, probably a male. The animals had simultaneously crossed in one region, but by different sections. The actual distance between them was larger and according to the path of movement by the river channel exceeded 15 km. The tracks of the various animals differed by segments of 10 to 20 km (by a straight line).

The area for which the tracks were noted of all the animals could be described by a rectangle of 16x26 km. and in excess of 400 km². This section was located in the highest central region of the Tunkinskii Ridge. The average density of population of snow leopard here according to data gathered is 1.5 individuals per 100 km².

Can one consider the research territory populated by a “core”? Apparently, one can. This territory includes the largest group of mountain goats in the mountain range, and perhaps in all the eastern Sayan. Moreover, to the west and east, the conditions for snow leopard habitat are worse and evidence about snow leopard less.

The only evidence in recent years about snow leopard in the more eastern region was in the upper reaches of the Zun-Khandagai River. In November of 1995, snow leopard tracks were found here along the major divide. The animal had crossed the ridge from the direction of the southern slopes through Udachnii Pass or V. Krupenin pass (Aleksii Usoltsev, pers. comm., and there is a photograph of the tracks). At present, the Zun-Khandagai River is the easternmost point of distribution of the snow leopard in the Tunkinskii Mountains and in Eastern Sayan. This point is located 35 km. from our study area and could also be included within the population “core” territory.

Even earlier evidence of snow leopard further to the east occurred in 1962/63. A hunting expert from Irkutsk Agricultural Institute found tracks of one individual along the watershed of the Irut and Bystraya Rivers. This point was further from our study area by a factor of 100 km. It is the eastern end of Tunkinskii Mountains and is located 25 miles from Lake Baikal. The appearance of snow leopard in this region could be connected to a high density of musk deer Moschus moschiferus characteristic of this region 30 years ago. In those years, a hunter with dogs could catch 5-6 deer in a day. In the winter of 1962/63, two hunters caught 80 musk deer in a 1/2 month period (B.K. Pavlov, pers. comm.).

In the western part of Tunkinskii Mountains, conditions for snow leopard life are a bit better than in the east. Most of all, the neighbouring region has the mountain junction at Munku Sardyk (3,492 m.), good habitat for snow leopard. It is located next to Tunkinskii Mountains and thus a natural corridor for the snow leopard—the only way to the Bolshoi Sayan Mountains and further into Mongolia to the mountains of western Hovsgol. It is not yet known whether a local group exists around Munku Sardyk. No one has observed a female with young here, but solitary, adult animals and their tracks have been found. The most recent two cases took place in the winter of 1996/97.

Khentei-Chikoiisky Uplands (Transbaikal, Russia)

Our field research was the first in this region. Material published earlier (Matyushkin, 1981; Baranov, Boiko, 1988; Bologov et al., 1996), was based only on questionnaire data. This evidence, as well as the new information, which was based on letters from local inhabitants in the last days before the expedition, was the main reason for choosing this region for study.
Working from the new information, we changed the original plan for the expedition and instead of one region, surveyed three where evidence of snow leopard seemed most reliable: Stanovik Ridge (section between Boruyan Peak – 1,906 m. – and Tarbal’dzhei River); Sokhondinskii Reserve (the Khentii Ridge itself); Chikokskii Range (section between Bystrinskii – 2,519 m. – and Kumyshkii – 2,350 m. – peaks).

Despite the fact that we met local people who had not only seen snow leopards or tracks, but had killed them as late as the 1990s, we were not able to find hard evidence about the species in this region during our field work. During more than 400 km. of study route in the territory of high mountains and middle-elevations, we did not once find clear tracks of snow leopard. In more reliable places with possible snow leopard habitat we collected 36 examples of excrement but the exact species determination awaits DNA analysis.

More often in the high mountains we saw tracks of wolverine Gulo gulo and in middle elevations, volunteer and lynx Lynx lynx. In terms of ungulates, most widely distributed are red deer Cervus elaphus, musk deer, moose Alces alces, boar Sus scrofa.

Western Hovsgol (Northern Mongolia)

In previous expeditions in 1995 (July, October-November), tracks of snow leopard were found only in the northern parts of the region – the Bayan Oooling Mountains. To the south – the Khor-dil’ Sar’ dag – the snow leopard has not been observed. It has been suggested that the snow leopard comes into Hovsgol from the Russian side through the mountain junction at Munkh Sardyk, connected with the Tunkinskii range. But how far and how often the snow leopard can travel into Hovsgol region remains unknown.

In 1997, places where snow leopard had appeared in the past were rechecked and new positions further to the south were studied. Along the main watershed, 21 transects were followed, with a length of about one kilometre each. The route went through all major high elevation points of the region – peaks at 3,130, 3,124, 3,103, 2,850, and 3,023 m. (due to mix ups of place names from various maps, I am citing only their elevations).

Along all the transects, only old scrapes and scat of snow leopard were found. We did not see any fresh ones, such as those found in 1995. The length of the transect where we found marking signs did not exceed 1/5 of their general length.

The southernmost border of snow leopard track incursions took place along the divide of Monguren-Gol, Dzharaik-Gol, and Khoton-Gol. A straight line distance from them to Munkh Sardyk would not be more than 70-80 km. The whole territory with potential for snow leopard takes up about 20% of the area of the western Hovsgol Mountains, while the region where sign of snow leopard actually occurred was about 1%.

In various scats of snow leopard, hooves of young mountain goat were found, thus giving evidence about summer incursions of the predator. In all probability, the snow leopard actively populates the territory during the breeding season of its prey. Conservation of the snow leopard in the region is now supported by national parks in Russia and Mongolia: Tunkinskii and Hovsgul. Thanks to the work of the English organization, Discovery Initiatives, the area of Hovsgol Park was expanded in 1997. Now both reserves form a single protected territory. The general border follows Bolshoi Sayan Range and Munkh Sardyk junction where there is an ecological corridor connecting eastern Sayan with the northernmost part of Mongolia. In the recent past, western Hovsgol apparently was a strong migration bridge between groups of snow leopard in Eastern Sayan and Khangai. Now the link is interrupted and highly weakened, even in the sections closest to Khangai or East Sayan mountains. A preliminary conclusion (without DNA analysis) is that in the past two years, animals have not gone into Mongolia from Eastern Sayan. But, in any case, sign was not observed in places where it occurred in 1995.

(In 1997 the expedition to the Eastern Sayan and Khentii Chikoiiskii Uplands was conducted with support from the Wildlife Conservation Society of New York and Sacred Earth Network of Massachusetts. The research in Western Hovsgol was supported by Discovery Initiatives, London. Gennadiy V. Efirkin, Aleksandr I. Ovchinnikov, Vladimir A. Feskov and Tsootgoiyn Byambazhav participated in the field work.)

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(Translation by Kathleen Braden)
the Key to the Cheetah’s Survival in Africa?

Over the years, these records have taught us much of what we know about cheetahs in the wild.

A cheetah mother typically gives birth to three or four cubs in a grassy lair in a clump of thick vegetation. For the first two months of their lives, the cubs are kept in this lair by their mother; they are immobile and defenceless, and particularly vulnerable. In the late 1980s, a study by Karen Laurenson showed that over 70 per cent of cubs die in their lair – and nearly two-thirds of those deaths are due to predators. When killers were seen, which was rare, they were nearly always lions: and as these weigh four times more than a cheetah mother, she is defenceless against them. Even after they leave the den, cheetah cubs are killed by predators, such as lions and hyenas; overall, only one of every 20 cubs born survives the 14 months to adolescence. They become independent of their mother at 18 months, but do not produce their first cubs until they are at least two years old.

Long-term projects such as this one are invaluable, since most of the female cheetahs participating in the playbacks were first seen as cubs. So I know their age and also how many cubs each female has reared. The oldest female in the study, a cheetah called Moshi, was a remarkable 14 years old; in captivity cubs live longer, sometimes up to 20 years.

Over the last four years, I have been using a hi-fi sound system to play recorded lion and hyena calls to learn more about how cheetah mothers contend with the threat of predators. It is powered by the battery of my Land Rover, and includes a digital audio tape (DAT) recorder, 200-watt amplifier (essential for playing lions, whose roars peak at 116 decibels), and a studio monitor speaker. The speaker and DAT player ensure accurate representation of the sound.

I use this information to examine whether reactions to lion roars could be related to the mothers’ success at rearing cubs. What I have found was surprising, and showed the important part other predators play in shaping cheetahs’ behaviour and movement patterns. Cheetah mothers of any age had a relatively small reaction to recorded hyena calls, suggesting that those animals are not the greatest threat. But with lion calls, it was a different story. Some mothers would move with their cubs up to 500 metres within half an hour of hearing a recorded roar.

Interestingly, those cheetahs who showed the strongest reaction to lion playbacks were those who had reared the most cubs. However, age was also important. A young mother would react less strongly, and her reaction was unrelated to how successful she was at rearing cubs. By contrast, the reaction of an older mother was directly related to her success in cub-rearing. The explanation is simple: young mothers are inexperienced in rearing cubs, and show little variation in their response to lions; any initial success they have is largely due to chance. However, as they get older, mothers either learn to avoid lions, and are consistently successful at rearing cubs; or they never learn – and never become very successful at rearing their cubs. This means that the most successful cheetahs are least often found close to lions.

Our work shows that when moving or reintroducing cheetahs, avoidance of other predators is important. Not responding to potential predators, and being unable to recognise dangerous situations, is a common cause of mortality when animals raised in captivity are released into the wild. Reintroduced cubs are just as vulnerable. If they are to be released into areas with lions, they need to be taught to avoid them first.

It was this observation of the high loss of cubs in open plains that led us to look at the situation in bush country, where cheetah mothers and their cubs are not so easily visible to potential predators. Preliminary results suggest that sub-subs have a far higher survival rate in bush country. Perhaps the ultimate survival of the cheetah lies there.

Sarah Durant

Sarah Durant is a research fellow at the Institute of Zoology, Zoological Society of London. Her work is funded by the Zoological Society of London, the People’s Trust for Endangered Species, the Royal Society, the US National Geographic Society and Frankfurt Zoological Society. The work is supported by Tanzanian National Parks.

Lynx Toll in Norway

Norwegian hunters killed 117 lynx in February and March out of a total population of about 500-600. The hunt did not reach the total of 155 authorized by the county wildlife management authorities. In 1996, 84 lynx of a quota of 102 were killed, and, in 1997, 95 of a quota of 146. The hunt is carried out under pressure from sheep farmers who say they are suffering from excessive predation by lynx on their flocks.

Lynx scientists are critical of the high quotas. Reidar Andersen, Associate Professor at the Technical University of Trondheim and project leader for lynx research was quoted in the newspaper Aftenposten as saying: “It may be risky to continue shooting lynx at this rate before we know more about these animals. In several of the counties we are at risk of shooting more lynxes than the population can stand.”

Lars Gangås, a field assistant who has spent the last four years following lynx in the field, refuted the idea that lynx concentrated on sheep. “It seems like many lynx don’t like mutton. Sheep are only emergency food for the lynx. The female lynx Helga (radio-collared) and her offspring (triplets) could easily have attacked sheep and lambs grazing only 200m from their lair. Instead she wandered for up to 18 hours through the flocks of sheep hunting for a hare. Generally, it appears that lynxes prefer natural prey like hares, larger birds and roe deer, not sheep”. “Furthermore, lynx do not kill just for pleasure, they only kill what they eat. The lynx Peer (another of the radio-collared study animals) once lay for two weeks in one place, coming back to the carcass of a young red deer it had killed night after night until everything was eaten”.

Considerable research on the lynx has been carried out in the counties of Hedmark and Nord-Trøndelag so that the county wildlife managers had a solid basis for setting hunting quotas. The managers in Nord-Trøndelag suggested a quota of 15 lynx. However, the quota was finally set at 32 – more than twice that suggested.

“I can’t help wondering about such decisions,” said Andersen. “Why are we working to understand the biology and monitor the population when the authorities respon-
sible make the interests of their hunting friends their primary concern? We might as well give up research altogether. One cannot manage vulnerable species on the basis of what the majority of some group of people ‘feel’ is right. Management must be based on biological factors – how much hunting a population can stand and remain viable."

John Linnell, another lynx scientist employed at the Norwegian Institute of Nature Research, said: "The real problem is not the fact that lynx are hunted, but in the basis for the setting of quotas. In southwest Norway there was unlimited hunting, in accordance with a policy of preventing lynx colonisation of this intensive sheep farming area. This is OK in principle as long as you allow the lynx to exist elsewhere."

In most of the other counties the quota was set by the county environmental protection office, as it has been for the last 3-4 years. Most counties were expected to increase the quotas this year under political pressure. However, in the counties of Hedmark and North-Trendelag, the two main lynx counties in Norway, an experiment in local management is being run. A committee in each of these two counties (in Hedmark it is composed of local politicians, sheep farmers and a token member of the NGO, the Nature Protection Association) has the power to set the quota. In effect there is nothing to prevent them from deciding to reduce lynx populations by setting high quotas.

“Our opinion was that there was no scientific basis to justify an increase in the quota in Hedmark from the level of the last three years. However, we were not given a chance to present our data to the committee,” said Linnell.

The hunt quickly ended in Hedmark after the female sub-quota was filled. However, the local committee immediately increased the quota again (so much for the foundation behind the original quota). In the end 14 lynx from a quota of 18 were killed. The quota in 1997 was only 12. According to Linnell, there was no evidence for a corresponding 50% increase in the lynx population between 1997 and 1998. "We only lost one radio-collared animal, an adult female, so it could have been worse for our study" said Linnell.

According to official statistics, compensation was paid in 1966 for a total of 9,862 sheep, mainly lambs, having been killed by lynx in Norway. Sheep are grazed unattended in forest habitats, and are therefore not protected from lynx, bears, wolverines and wolves. Most flocks are very small, many owned by "hobby farmers". The state invests 1.6 billion kroner ($213,333,000) in subsidies to get a product with a value of one billion kroner ($133,333,000).

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Canada Lynx to be Proposed for US Endangered List

The Canada lynx *Lynx canadensis* will be proposed for addition to the list of endangered species in the contiguous 48 states under a settlement submitted to the U.S. District Court in Washington by the U.S. Fish and Wildlife Service. The settlement could bring closure to litigation over the species that includes 15 plaintiffs and dates from 1991.

The Service determined in 1997 that the lynx warranted protection under the Endangered Species Act, and that a number of factors threatened the animal’s existence in the lower 48 states. However, the agency postponed a listing proposal then because other species were determined to be in greater need of protection under the Service’s listing priority system. The settlement is being sought to avert additional court costs and protracted staff time.

Historically, the Canada lynx was a resident of 16 states in the contiguous United States: Maine, New Hampshire, Vermont, New York, Massachusetts, Pennsylvania, Michigan, Wisconsin, Minnesota, Washington, Oregon, Idaho, Montana, Wyoming, Utah, and Colorado. The range continued north into Canada and Alaska. Lynx infrequently dispersed into six other states — North Dakota, South Dakota, Iowa, Indiana, Ohio, and Virginia — but were not considered resident in those states. The animals in these six states appear to have been transients dispersing during periods of high lynx population density elsewhere.

Lynx are believed to remain in small populations in only three of the 16 states which they historically inhabited — Montana, Washington and Maine. Lynx are considered extremely rare or extirpated in the remaining states. Publication of a rule in the Federal Register proposing listing of the lynx will include a public comment period, and public hearings will be held throughout the current range of the contiguous U.S. lynx populations.

In the eastern states, lynx live in areas that are transitional between boreal/coniferous and northern deciduous forests. In the west, they live in subalpine/coniferous forests. Mature forests with downed logs and windfalls provide cover for denning, escape and protection from severe weather. The same areas provide habitat for the lynx’s primary prey, the snowshoe hare, and other small mammals and birds that supplement the lynx diet. The home range of a lynx can extend from five to 94 miles and the animals are capable of covering long distances in search of food.

The Canada lynx has large well-furred paws that aid in hunting in deep snow, long tufts on the ears and a flared facial ruff, and a short, black-tipped tail. Males average 22 pounds (9.9 kg) and about 34 inches (85 cm) in length; female lynx are slightly smaller.

*USFWS Press Release, 17 Feb. 1998*
Lynx Threatened by Massive Toxic Spill in Spain

A massive toxic spill into a river in south-eastern Spain threatens immense damage to the Doñana National Park, important habitat for the endangered Iberian lynx *Lynx pardinus*, as well as for millions of birds and other animals.

The disaster was caused by the breaching of the wall of a reservoir holding waste from processing of zinc, copper, lead and silver at an open-pit mine owned by the Swedish-Canadian company Boliden. A 50 m wide breach released four million cubic metres of acidic water and silt into the Agrio river, which flowed into the Doñana park. Emergency construction of a mud barrier diverted the water away from the Doñana into the Guadalquivir River. However, the water flooded 2,000 ha of farmland where it has deposited most of its silt, containing cadmium, mercury, arsenic and other heavy metals.

Michael Priester of Projekt Consult, a mining consultancy, was quoted by the New Scientist (2 May) as saying that the metals would bind to soil particles and leak slowly into groundwater. Runoff from contaminated land would flow into the Doñana, where it would be taken up by plants and enter the food chain. At this stage it could affect the lynx and its prey.

Conservationists are especially angry because the company refused to accept complaints that the dam was unsafe three years ago. A court case is pending. The company, on the other hand, says the breach was caused by a seismic shift, although a local geological institute says it had not detected one.

Birds are being found dead in large numbers, and agricultural land has been poisoned, ruining farmers.

The President of the Royal Academy of Exact, Physical and Natural Sciences, Angel Martin Munico, declared: “The repercussions of this spill will be for eternity over thousands of hectares.”

There are about 50 lynx in the Doñana National Park, and it is the most intensively studied sub-population. Spanish lynx specialists recently put the total population at about 800, fragmented into many sub-populations, the largest in central Spain numbering about 400.

The IUCN Cat Specialist Group rates the Iberian lynx as the most endangered cat species because of the limited number of habitats it uses, and its small range, which is restricted to the south-western quadrant of Spain with small overlaps into Portugal. Formerly it was found throughout the Iberian peninsula.

Ecology and Behaviour of the Kodkod in a Highly-fragmented, Human-dominated Landscape

The kodkod *Oncifelis guigna* is a small terrestrial forest predator of birds, lizards, rodents, domestic chickens and geese. They readily climb trees when threatened. Seven kodkods were captured and radio-collared on Isla Grande de Chiloé, Chile, in November 1997. These cats were found to be stalking predators capable of taking prey as large as domestic geese and Chilean pigeons slightly larger than typical domestic pigeons. They showed no consistent activity patterns and were as likely to be active during the day as at night. Long distance movements occurred at night as well as during the day, the cats using thick vegetation corridors for cover. Kodkods were very rarely observed by local residents. Indeed, the only observations reported were those when male kodkods were seen raiding henhouses or observed taking free-ranging chickens. No female kodkod observations were reported to us.

Morphological data show sexual dimorphism with males being larger than females (Table 1).

| Table 1. Measurements (mm) and weights (kg) of kodkods captured on Isla Chiloé |
|---------------------------------|-----------------|-------------------|
|                                 | Males (n=5)     | Females (n=2)     |
| Head circumference              | 196.3           | 170.0             |
| Neck circumference              | 158.8           | 157.5             |
| Canine (upper/lower)            | 9.6/9.5         | 9.0/8.2           |
| Body                            | 467.4           | 440.0             |
| Tail                            | 233.3           | 217.5             |
| Hind foot                       | 100.8           | 89.0              |
| Ear                             | 39.3            | 41.0              |
| Weight                          | 2.2             | 1.7               |

Home ranges were determined by using 90% of the total area occupied by individuals (Table 2). These results are based on three months of data and will be updated after the conclusion of the study.

| Table 2. Home range sizes (ha) of radio-tagged kodkods |
|---------------------------------|-----------------|-------------------|
| Individual (m/f)                | Hectares (n)    | Comment           |
| 393 (m)                         | 62.61 (31)      | range now expanding |
| 182 (m)                         | 80.92 (101)     | range well defined |
| 063 (m)                         | 31.84 (30)      | range well defined |
| 313 (m)                         | 42.97 (68)      | range well defined |
| 044 (m)                         | 256.17 (45)     | wandering aged male |
| 022 (f)                         | 39.43 (86)      | range well defined |
| 201 (f)                         | 28.31 (112)     | range well defined |

Male 182s territory overlapped females 022 and 201 and was bordered to the north by male 063, east by the sea, west by a well travelled dirt road, and south by male 393. With the exception of female 201, all kodkod territories contained human properties with occupied homes in a landscape highly modified by human activities, such as farming, dairy cattle operations, woodcutting, and poultry raising. Male home ranges were mutually exclusive, as were the two female home ranges.

Aged male 044 was found to be roaming over a large area and not maintaining a specific territory. Though the area he travelled through contained the area occupied by male 313, 044 was apparently excluded from this area.
Male 044 occasionally made long-distance movements of 5 km or more in an eight-hour period from 22.00 hr to 06.00 hr.

One male and one female melanistic kodkod were captured. One kodkod was found in an apple tree not 5 m from a house. He must have gone up the tree in the middle of the night when the family dog came by and was unable to get down by daybreak.

After spending the day in the tree sleeping he made his escape in the evening.

Ongoing studies are documenting kodkod interactions, behaviour and the use of corridors in the highly-fragmented, human-modified landscape of northern Isla Grande de Chiloé.

This study was funded by generous support from the Bosack and Kruger Charitable Foundation.

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The Feral Cat in Mauritius

Introduction

Many mammals have been introduced to Mauritius in the last three centuries. These include members of a wide range of taxa, carnivores, ungulates, primates and rodents, together having a wide range of impacts at various levels in the ecosystem (see Cheke, 1987, for a review). Several species are problems globally, and many have been implicated in the extinction or near extinction of bird, reptile and invertebrate species on many oceanic islands (Atkinson, 1996).

One of the most damaging species to the native fauna is the feral cat Felis catus. Many cats were noted on Mauritius by the Van Warwick expedition in 1601, and they may have been introduced by Arab sailors centuries earlier. It is not clear if the introductions were intentional or accidental, but some authors believe the species to have been introduced to control rats (Cheke, 1987). They may be an early breed of domestic cat, possibly originating from the African wild cat F. lybica, a species the Arab seafarers would have had access to (Severin, 1982). They were kept on board ships to control rodents, and may have escaped when ships came to land.

Feral cats deep in the Black River Gorges and native forests of Mauritius have many pelage and morphological traits in common with F. lybica, such as a long, banded tail, long legs, broad muscular shoulders, white whiskers, a strip of dark fur running down the spine, with dark stripes running off of it, orange fur behind the ears and a strip of dark fur running under the chin. Many of these features are diagnostic of F. lybica (Skinner et al., 1990).

Cats have been given some of the blame for the extinction of land tortoises and lizards in Mauritius and Rodrigues, and several predation incidents on reptiles have been observed and recorded in the literature (Cheke, 1987; Roy and Jones, unpublished).

As a bird predator, cats may have been an important cause in the decline and extinction of many endemic species. Many of the species would have been declining due to a combination of factors, such as habitat destruction and hunting by people, and would not have been able to tolerate further predation. The story has repeated itself around the world (May et al., 1996). Many island species have evolved in the absence of mammalian predators, and as a result have poor predator evasion responses. They spend a lot of time on the ground, and are easy targets. Introduced predators are a major cause of extinction (Atkinson, 1996).

The pink pigeon Columba mayeri and Mauritius kestrel Falco punctatus have been brought back from the verge of extinction and persist due to intensive management regimes (Jones, 1987; Jones et al., 1992; Jones et al., 1995). Introduced predators, especially cats and mongooses continue to have a devastating effect on these extant species, and predator control plays a major role in their management. In 1992, 16 of the remnant wild pink pigeon population of 32 in the cloud forests of Pigeon Wood were lost. The losses were believed to be due to cat predation. In 1996, 25 of the introduced pink pigeon population of 78 in Bris Fer in the highlands of Mauritius were again lost to predators. Several carcasses were found and they were determined to be cat kills (Roy and Jones, unpublished).

The management of the cat in Mauritius

A Ph.D study on the introduced small Indian mongoose Herpestes javanicus (=aurupunctatus) in Mauritius by S. Roy of the University of Bristol began in January 1997. The study is supervised by Prof. S. Harris of Bristol University and Dr Carl Jones of the Mauritius Wildlife Foundation. Since that time, many cats have been caught in mongoose traps, and at field stations around Mauritius, and data have been systematically collected on the species by all field staff of the Mauritius Wildlife Foundation.

Cats and mongooses have been extensively trapped at M.W.F. sites since 1992. Traps are simple meter-long wooden box traps, baited with fish soaked in fish oils. They are killed humanely. Standard body measurements are taken, and the skins and skulls are retained. Samples are deposited with Dr Andrew Kitchener of the Royal Museum of Scotland, where taxonomic studies are being conducted on wild and feral cats. Guts are removed and food items are sorted. In addition to this, all sightings and footprints are recorded, and all cats found in the field are collected and sorted into different food items. Road kills are also collected.

From April 1997 the trapping regime has been revised. Traps are laid out in a simple grid system in the main breeding and feeding sites of pink pigeons. Traps are placed 100 meters apart. The grid is surrounded by a peripheral ring of traps. The strategy behind this is to create a predator free zone in the grid area and to catch immigrant animals in the perimeter ring, before they reach and do any damage in the core area. There are between 20 and 26 traps at each of three field stations. Bird depredation has been reduced and there has been a significant increase in the number of cat and mongoose captures.

The data so far

Of the observations made from 1995-1997, most coincide with the daily hours of field work, but peaks are evident at dusk and night (Graph 1). Kittens have been observed in the wild from November to January, and observations suggest a litter size of two to three. The majority of observations involving "wild type" feral cats have been made in mid-altitude and up...
land areas, few have been made in and around towns.

Trapping records (Graph 2) show that most cats are caught in the dry spring and summer months from August to December. The reasons for this are unclear, and poison take by rats shows similar trends.

Dietary studies (Graph 3) show the cat in Mauritius to have a fairly broad diet, as found elsewhere (Nogales et al., 1996; Paltridge et al., 1997). This broad diet indicates that the species is able to make use of a wide variety of food resources, making it a successful and ubiquitous invader. Reptiles and birds feature highly in the diet and the species poses a high predation risk to several endemic birds, especially the pink pigeon Cathura mayeri. In future, we will analyse data further to look for differences in diet between males and females, and between different locations and seasons.

Graphs 4 and 5 (see next page) show the body measurements and weight of male and female cats caught over the last five years. These will be further analysed in future to look for correlations with climatic and environmental variables. Skulls will also be measured in detail for this purpose. These data will be compared to existent morphological data from populations occurring sympatrically with competing carnivore species to assess whether or not the feral cat on Mauritius is showing ecological release to fill an apparently empty niche.

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References

Stomach Contents of an Asiatic

An adult male Asiatic golden cat Catopuma temmincki carcass was presented to me on 17 February 1996 in Kaeng Krachan National Park by Park Chief Samart Moungmoitong. The three-day-old carcass had been confiscated by park officials from a poacher who had shot the cat in the northern section of the park.

The following physical parameters were recorded:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>Male</td>
</tr>
<tr>
<td>Age</td>
<td>Prime adult (4-7 years)</td>
</tr>
<tr>
<td>Weight</td>
<td>12.5 kg</td>
</tr>
<tr>
<td>HB</td>
<td>880 mm</td>
</tr>
<tr>
<td>TL</td>
<td>430 mm</td>
</tr>
<tr>
<td>TTL</td>
<td>1,310 mm</td>
</tr>
<tr>
<td>Front paw spur</td>
<td>50x46 mm</td>
</tr>
</tbody>
</table>

Stomach contents included vertebrae and rib remains from a small (<40 mm TTL) snake. Comparison with a reference at Bangkok’s Para Zoo reptile collection identified the remains as belonging to the genus Natrix from the large snake family Colubridae.

With the exception of two scat samples from Sumatra analyzed by Griffiths (1993) containing rat and muntjac remains, virtually no other concrete data exists on the diet of Asiatic golden cats. The presence of a snake in the diet should not be viewed as unusual, given the medium body size of...
Nepal Burns Contraband Animal Parts

Nepalese officials torched a huge pile of contraband animal parts, including tiger bones and skins seized from poachers and illegal traders in Chitwan National Park on 23 March.

The Minister for Forest and Soil Conservation, Hridayesh Tripathy, set alight the pile, said to include 144 kg of tiger bones, two tiger hides, 187 pieces of leopard skin, two unidentified wild cats, 874 rhino hides, 1,363 rhino hooves, two python hides, two alligator hides, three crocodile skins, 55 hyena hides, five barking deer skins, 164 pieces of unidentified hides, five kg of monkey skulls and 33 kg of Tibetan antelope wool.

The contraband was destroyed after consultations with officials of CITES, the international convention governing trade in endangered wildlife.

But, according to the Kathmandu Post, some people argued that the goods would have fetched millions on the international market and other options should have been explored because they could have provided a huge amount for conservation in Nepal.

Chitwan National Park is considered one of the finest in Asia. Apart from its tigers, numbering about 75, it has the second largest population of Asian one-horned rhinos. But it is also a favourite haven for poachers and wildlife guards posted to protect the endangered animals have a difficult time controlling poaching.

Wildlife Poaching and Trade in Cambodia

Virachey National Park, which sits in Cambodia’s northeastern province of Ratanakiri is one of Asia’s largest protected areas. Because of its remoteness and relative inaccessibility, much of this park is scientifically unexplored and unknown. However, recently, WWF has begun to conduct conservation activities in Virachey National Park and other nearby protected areas in neighbouring Laos and Vietnam.

The several rapid biological and ecological surveys conducted to date have indicated that Virachey is rich in biological diversity. In particular, this park is an important refuge for tigers, *Panthera tigris*.

There are also relatively large populations of prey species, including gaur *Bos gaurus*, banteng *Bos javanicus*, sambar *Cervus unicolor*, muntjak *Muntiacus muntjak*, and wild pigs *Sus scrofa*. These prey species and the relatively undisturbed and extensive habitats, provide the ecological conditions necessary to support large populations of tigers.

However, it is apparent that there exists a relatively significant trade in wildlife that also includes tigers.

Information collected by the park staff at WWF’s request staff indicated that 39 tigers have been killed in Veun Sai and Ta Veng districts over the past 12 years. Fourteen tigers were killed in 1997 alone, and during the first two months of 1998, three tigers have been killed.

Since these figures represent the numbers of tigers that have been killed from two districts in Ratanakiri that are represented within Virachey National Park and the buffer zone area, the total number of tigers being taken from all of Ratanakiri Province is likely to be much higher.

During an interview with a Vietnamese wildlife trader based in Banlung, the capital city of Ratanakiri Province, we were told that he could supply up to 3-4 tigers a month. Most of these tigers and products are sent to Pleiku, in Gia Lai Province, Vietnam. Some skins and live animals are also sent by boat to Phnom Penh, via Stung Treng.

We were told that wildlife products can be transported across the international borders to Vietnam with ease. There are few or no checkpoints, and these are easily paid off. Wildlife products are also sent to Phnom Penh on Royal Cambodge Airline flights.

Tiger products are taken to Vietnam along Route 19 and to Champassak Province in Laos along Route 194. The skins and bones are hidden in rice sacks and taken by bus. Both skin and bones will bring about $1,000 per tiger. An undamaged skin will fetch about $40 per kg and bones are sold for about $80 per kg.

Most of the tigers are killed using guns, but more recently poachers have begun to use snares and mines. The mines are made by the poachers, using powder and caps supplied by middlemen, usually ethnic Chinese living in Veun Sai. Between 1995 and 1998, 20% of the tigers that were poached from Virachey National Park were killed with mines.

These figures reflect both bad and good news. The bad news is that many tigers and other important species – including significant prey species – are poached from the national park. The good news is that the figures indicate that Virachey National Park and the larger landscape within which it sits harbour a larger tiger population than previously thought in Indochina’s habitats. Now, concerted efforts are necessary to ensure that the poaching and the trade in wildlife is stopped.

Golden Cat

Asiatic golden cats and their likely opportunistic hunting strategy. Prey as small as mice up to young boar size most likely fall within the hunting ability of the cat, thus allowing for a wide range of potential prey items in between, including snakes and possibly other reptiles too.

I thank Pat Zoo Reptile Curator Wirot Nutaphand for his assistance in the identification of the snake remains.

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*Eric D Wikramanayake*  
*WWF Indochina Programme*

CAT News 28
Studbooks

International Tiger Studbook 1997

On 31 December 1996 the following tigers were held in the world’s captive facilities:

<table>
<thead>
<tr>
<th>Species</th>
<th>No.</th>
<th>Male</th>
<th>Female</th>
<th>Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amur tiger</td>
<td>501</td>
<td>(238)</td>
<td>(263)</td>
<td>175</td>
</tr>
<tr>
<td>Panthera tigris altaica</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sumatran tiger</td>
<td>210</td>
<td>(104)</td>
<td>(106)</td>
<td>80</td>
</tr>
<tr>
<td>P. t. sumatran</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bengal tiger</td>
<td>245</td>
<td>(128)</td>
<td>(117)</td>
<td>25</td>
</tr>
<tr>
<td>P. t. tigris</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South China tiger</td>
<td>47</td>
<td>(28)</td>
<td>(19)</td>
<td>18</td>
</tr>
<tr>
<td>P. t. amoyensis</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indo-Chinese tiger</td>
<td>25</td>
<td>(8)</td>
<td>(19)</td>
<td>4</td>
</tr>
<tr>
<td>P. t. corbetti</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1,028</td>
<td>(504)</td>
<td>(652)</td>
<td>302</td>
</tr>
</tbody>
</table>


International Cheetah Studbook 1996

Captive population on 31 December 1996:

<table>
<thead>
<tr>
<th>Species</th>
<th>No.</th>
<th>Male</th>
<th>Female</th>
<th>Cubs</th>
<th>Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cheetah</td>
<td>1,217</td>
<td>608</td>
<td>602</td>
<td>.7</td>
<td>240</td>
</tr>
</tbody>
</table>

in 50 countries. Of the population 884 (73%) were captive-born, and the remainder wild-born.

Studbook Keeper Laurie Marker concludes: "The relative success in the world’s captive cheetah population over the past few years suggests that an increased reproductive success throughout the world’s facilities could be achieved through a co-operative management program. Reproductive success has decreased since a peak in 1993 with the number of cubs born. Much of this decrease is accounted for through managed breeding programs, such as the North America SSP and Europe’s EEP. In 1996, though, there was marked decrease in both the number of litters and cubs born.

"It is important that the successful breeding facilities co-operate in the managed reproduction of animals and that animal transfers that facilitate breeding priorities be implemented.

"Although a few of the world’s facilities have had significant reproductive success, importation of wild-caught animals into the captive population has been a primary reason for the population’s growth. This has been especially true in the southern African region, where 30% of the region’s population is wild-caught. Although there has been continued reproductive success in this region, less than 10% of captive-born animals have remained in the population. The development of a managed breeding program and the co-operation between facilities is even more important in range countries.

"As the free-ranging population of cheetah continues to decline and a large amount of genetic diversity of the remaining free-ranging population is lost, the captive and wild populations should be managed in co-operation. In the future, in the absence of further imports from the wild, the size of the world’s captive populations would be expected to decline, unless there is improvement in captive breeding. The use of a global management program will be a critical component for the long-term future of the species."


International Caracal Studbook

On 31 December 1994, the following caracals were held in captive facilities:

<table>
<thead>
<tr>
<th>Species</th>
<th>No.</th>
<th>Male</th>
<th>Female</th>
<th>Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caracal</td>
<td>194</td>
<td>99</td>
<td>95</td>
<td>80</td>
</tr>
</tbody>
</table>


**Track of the Tiger: Legend and Lore of the Great Cat**

Ed. Maurice Hornocker
Sierra Club Books
ISBN 0-87156-973-6
120 pp.
Available from Hornocker Wildlife Institute
PO Box 3246
Moscow, ID 83843 (USA)
- $50 signed by Maurice Hornocker
- $30 unsigned
- $7.50 shipping and handling.
Donations of $20 or $50 to the Siberian Tiger Project can be made at the same time

**Track of the Tiger** contains 10 articles on tigers which convey the tremendous impact the great cat has on people. In his introduction, Hornocker recounts his first sight of a tiger, drawn at night to a buffalo bait in India’s Sariska reserve in 1971 and the spell it cast on him. It was 21 years before he saw another wild tiger – in the Russian Far East, where he and colleagues launched the on-going study of the Siberian tiger in 1992 as a co-operative project with scientists from the Russian Academy of Sciences.

As he says: "Tigers have captured man’s imagination since the beginning of time. The tiger’s power, grace and beauty have forever enthralled and inspired mankind and have achieved a cultural identity in some human societies. And cultural considerations can overpower both politics and economics. This may be the best hope for tigers in the long run."

Later in the book, he gives an account of the Current Siberian Tiger Project and the excellent collaboration between Russian and American scientists.

Peter Mathiessen tells about his experiences visiting the Siberian Tiger Project, and Geoffrey Ward writes of the famed Indian tigerman, Fateh Singh Rathore, and his achievements in making the Ranthambhore Tiger Reserve renowned as the finest place to
Obituary
Prof. Dr Paul Leyhausen

Paul Leyhausen, one of the distinguished cat scientists of our time, died suddenly on 14 May, aged 81. Leyhausen was especially interested in the ecology and behaviour of cats, and his book *Cat Behaviour* (Garland STPM Press, New York, 1979) became a standard work. He collaborated with Konrad Lorenz at the Max Planck Institute for Physiology of Behaviour and together they published *The Motivation of Human and Animal Behaviour* (Van Nostrand Reinhold, New York, 1973).

Leyhausen became Founder Chairman of the IUCN Cat Specialist Group, a position he held for 10 years, during which he promoted the first scientific study of the Asiatic lion *Panthera leo persica*, carried out by Paul Joslin in the Gir Forest in India; the first research into the man-eating behaviour of the tiger *Panthera tigris* in the Sundarbans by Hubert Hendrichs, which was unfortunately terminated by the Indo-Pakistan war leading the establishment of Bangladesh; and the campaign for the protection of the newly-discovered Iriomote cat and research into its status and ecology. To the end of his life he insisted that the Iriomote cat was a distinct species, and possibly a unique genus *Mayallurus iriomotensis* as described by Imaizumi (1967) (Leyhausen and Pfeiderer, 1994). Nevertheless, it is now listed as a subspecies of the leopard cat *Prionailurus bengalensis* (Wozencraft, 1993).

He chaired a three-man group which carried out a mid-term assessment in 1976 of India's Project Tiger, which led to recommendations which remain valid.

After pre-World War II studies, Leyhausen joined the Afrika Corps in June 1942, but was captured by the British four weeks later, spending the rest of the war in a POW camp in Canada. Released in 1947, he resumed his studies and received his doctorate *summa cum laude* for his dissertation on the behaviour and systematics of large cats. He received a research grant to study cat behaviour at the Natural History Museum Koenig in Bonn, and later was head of the Biology Department of the German Scientific Film Institute.

In a *Laudatio* Konrad Lorenz noted that Leyhausen was the first to provide a fairly complete ethogram of a higher mammal, the house cat *Felix catus*, and that his essays on expression and impression presented for the first time since Darwin a comprehensive theory of pre-verbal communication in animals and man, including the phylogenetic and ontogenetic history of the behavioural systems involved. He concluded: "There are few contemporary ethologists whose merits are so evenly divided between the analytical, the theoretical and the practical, and whose work has grown so many ramifications reaching out to so many other fields."

Leyhausen is survived by his wife, Barbara, his close collaborator in his cat work, and two daughters.

References

REVIEWS

see tigers in the wild by daylight.

Elizabeth Reed, wife of the former Director of the US National Zoo in Washington DC, brought up a white tiger cub in her home and describes the trials and tribulations, and the pleasure, involved.

An account from former times by a British big game hunter, Colonel A.N.W. Powell, tells of going after a cattle-killer in true Indian style. Fortunately for the offending tiger, her cubs appeared first, and Powell became so entranced that he watched them, and the mother when she arrived, for three hours, and then retired without shooting them — an unusual event in those old days. An interesting part of this account is that, while Powell was watching, a male roared and the cubs jumped to the side of their mother, who suppressed an answering roar. He assumed it was "Papa". Powell believed, like most others at that time, that the father of cubs would kill them if he got the chance. Recent observations have been of presumed fathers, mothers and cubs happily together, and it appears that mothers and cubs have only to fear strange males, which are likely to kill the cubs to bring their mother into breeding conditions. Powell was probably wrong in identifying the roaring male as "Papa".

Confirmation of modern observations comes from film-maker Stanley Breeden, who tells of a male taking over another's territory. The defeated tiger had left behind cubs, and they were only eight months old when, as Breeden watched, the new territorial male mated with their mother — very unusual for a female with cubs to accept. A month later, near the mating place, Breeden found signs of a struggle. The male emerged from a bamboo clump, and there Breeden found the mangled remains of one of the cubs.

Indian novelist R.K. Narayan writes as a tiger telling of his life in the forest, including an encounter with a tigeress in which both were badly wounded. A jackal told the tiger there was no reason to be enemies; combined they could make the jungle shake. So he comforted the badly injured tigress, and it led to — of course — cubs.

Photographer Art Wolfe, declares the tiger to be, from an artist's point of view "the quintessence of a photographic subject — nature's blessing of design." OK, but he then learned a lesson.
After photographing an apparently tranquil Siberian tiger, he turned away to get more film. He was no longer in eye contact – in a flash the tiger charged, to be halted only by a barrier.

Famed hunter of man-eaters, Jim Corbett, has the final chapter. His story is of watching a cub grow to adulthood in the Himalayan foothills. The tiger became a notorious killer of livestock, and many hunters went after him unsuccessfully. But, one day, a villager fired at him with a muzzle-loader and obviously wounded him. Corbett feared he would become a danger in the area, and went after him. He got him – and found that the wound was almost healed and not crippling.

"Pleasure at having secured a magnificent trophy... was not unmixed with regret, for never again would the jungle folk and I listen with held breath to his deep-throated call resounding through the foothills, and never again would his familiar pugmarks show on the game paths that he and I had trodden for 15 years."

The accounts are interleaved with a series of magnificent photos of tigers.

**Peter Jackson**

---

**Wildlife Field Research and Conservation Training Manual**

by Alan Rabinowitz

Wildlife Conservation Society

Bronx Zoo, NY 10460-1099 (USA)

Revised and reprinted 1997

ISBN 0-9642787-0-7

281 pp.

Alan Rabinowitz is one of the most experienced of field scientists studying the wild cats. He first carried out research on the jaguar in Belize, and got the government to establish the first reserve anywhere specifically for jaguar in the Coxcomb Basin. He spent five years studying tigers, leopards, leopard cats and civets in Thailand, and later led extensive surveys in Laos and Myanmar.

He conducted training courses on wildlife research and conservation in Sabah, Sarawak, Myanmar, Taiwan and China, and it was from this experience that the training manual has emerged.

Starting with a list of the field and classroom equipment required for training exercises, the manual goes on to outline the course, and to set out the programme for training junior staff. Drawings and outline notes are provided.

Part 2 deals with training of senior staff, which Rabinowitz says is necessary because, while many have been trained in biological sciences and are knowledgeable about basic ecological principles, they have not been trained as leaders nor in management of wildlife and parks. Lack of planning, monitoring and management often leads to a state of continual crisis management, he states.

A reference section provides a valuable list of publications on the practical aspects of wildlife research and management.

This is a publication which should be in the hands of, or available to, everyone involved in wildlife research and management, especially in the Third World.

**Peter Jackson**

---

**Eighth International Snow Leopard Symposium: Proceedings**

Ed. Rodney Jackson and Ashiq Ahmed

International Snow Leopard Trust (1997)

Seattle, WA 98103 (USA)

237 pp.

The International Snow Leopard Trust is among the foremost of field conservation organizations, with a record of serious achievement. Having had its first symposia in western countries, it moved then to the countries where the snow leopard is found – to India, Kazakhstan, China, and, in 1995, Pakistan, in association with WWF Pakistan. Thereby it has created a sense of involvement among conservationists in those countries. Workshops have been a practical supplement.

The proceedings include reviews of the status of snow leopards and their prey in each of the range countries. There follow papers on the lessons, accomplishments and opportunities arising from conservation programmes. The symposium had a welcome group of scientists from the Central Asian Republics and a special session was held on biodiversity conservation in their area.

The result is a valuable reference work on snow leopard conservation.

**Peter Jackson**

---

**Eyes of Fire: Encounter with a Borderlands Jaguar**

by Warner Glenn

Printing Corner Press (1996)

El Paso, TX 79906 (USA)

ISBN 0-918080-79-7

28 pp. $16

Order from Warner Glenn

PO Drawer 1039

Douglas, AZ 85608 (USA)

Hope that the jaguar survived in the southern USA lingered on, although no evidence was reported for many years. On the morning of 7 March 1996, Rancher Warner Glenn and his daughter, Kelly, went riding up Hog Canyon in the Peloncillo Mountains of southern Arizona with their dogs, looking for mountain lions. They came across what appeared to be the tracks of a large male, and the dogs were on the trail. After a longish ride, Glenn heard the dogs baying and saw a large, buff-coloured animal like a lion on top of a bluff. Getting nearby on his mule, he dismounted and headed for where the dogs were barking.

"I walked around some thick trees and bush. Looking out on top of the bluff, I was completely shocked to see a very large, absolutely beautiful jaguar crouched on top, watching the circling hounds below. I was stunned by the surprise and beauty of the scene."

Glenn had a camera with him and fired off a series of shots, believed to the only ones of a wild jaguar taken in the USA; the

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**Spring 1998**
best of them are reproduced in this book.

The jaguar descended and took refuge in a hole in a canyon. Glenn, still photographing, got within 10 feet (3 m.) when the jaguar charged. Fortunately for Glenn two of his dogs rushed forward and checked the cat, sustaining some minor injuries.

It is an exciting account of a moment to go down in history. Subsequently, the Fish and Wildlife Service moved to list the jaguar as Endangered throughout its range, which thereby includes the USA with Mexico and central and south America.

Glenn and other ranchers have established a Jaguar Fund of the Malpai Borderlands Group to compensate livestock owners for confirmed predation by jaguars, to protect habitats of jaguars and other animals, as well as to support other wildlife projects. Part of the proceeds from the sale of the book go to the Fund.

Peter Jackson

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**Cat Specialist Group – Spring 1998**

*(Preliminary List indicating those who have responded to the invitation for the current IUCN triennium)*

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Wild Cats: Status Survey and Conservation Action Plan
compiled and edited by Kristin Nowell and Peter Jackson
IUCN, Gland, Switzerland
(ISBN 2-8317-0045-0), price US$40/£26.75

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CAT News

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Photo: Hormoz Asadi (see page 2)