CAY NEWS

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Cover: Bhutanese greeting card for the Year of the Tiger
THE YEAR OF THE TIGER

This is the Year of the Tiger in the Chinese calendar, and that of several other Asian countries. The cover of CAT NEWS is a Bhutanese design to celebrate the New Year.

The magazine China Reconstructs wrote recently that, according to Chinese tradition, one avoids bad influences by recalling the power of the tiger, and it is believed that a child born in the Year of the Tiger will be happy.

The magazine stated that the tiger is a rare animal, its pelt is expensive and its bones were precious medical materials in China, where its flesh, blood, viscera and pads also served as the basis for medicines.

After describing the tiger as "very savage" in the wild, the magazine said that a cub can become very tame, and, according to historical documents, people in ancient times trained tigers to help in the fields.

The magazine says that the tiger symbolized in China a vigorous character and a courageous spirit. In former times warlords and brigands sat on thrones covered with tiger skins to demonstrate their power and majesty.

At the festival of Duanwu on the fifth day of the fifth month of the lunar calendar Chinese hang up images of tigers, carry a sachet of perfume in the form of a tiger, and make cloth tiger toys. Because the markings on a tiger's forehead resemble the Chinese character "Wang" or "King", the character is drawn on the foreheads of children with a mixture containing wine and mercury so that they will be vigorous and healthy. Children are also given tiger head hats, shoes embroidered with tiger heads, and tiger-shaped pillows in the hope that they will become as robust as tigers.

Having read that, now see what Chinese scientists have to say about the tiger in China today in the report on a symposium on tiger.

FRIENDS OF THE CAT GROUP

CAT NEWS is now available to anyone who subscribes a minimum of $10 (or equivalent) a year as a "Friend of the Cat Group". The funds will help to defray costs of production and distribution and create a small fund for discretionary use by the Chairman to advance the objectives of the Cat Specialist Group.

Cat Group members receive CAT NEWS as a matter of course, but they are welcome to make a voluntary contribution to the Chairman's Fund. The account is maintained by the IUCN Finance Department. Cheques should be made payable to "IUCN Cat Specialist Group".
An International Symposium on Global Survival Strategies for Tigers was held from April 13-16 at Minneapolis-St Paul. It was sponsored by the Minnesota Zoo in collaboration with the IUCN/SSC Captive Breeding and Cat Specialist Groups and the Tiger Propagation Group of the American Association of Zoological Parks and Aquarium's Species Survival Plan (AAZPA/SSC).

The occasion brought together leading specialists on tiger from all over the world, including China, India, Indonesia, Malaysia, Nepal, USA and Europe. Soviet scientists sent their regrets at not being able to be present.


A Global Tiger Survival Plan is the proposed outcome of the symposium, the proceedings of which should be available before the end of 1986.

The Keynote Speaker was Gren Lucas, Chairman of the IUCN Species Survival Commission.

A special tribute must be made to Dr Ronald L. Tilson of the Minnesota Zoo for the successful organization of this excellent meeting.

The most urgent problem highlighted at the symposium was the near extinction of the South China tiger *Panthera tigris amoyensis*. Chinese specialists reported that steps were already being taken to establish a captive breeding programme in Chinese zoos, and made a plea for international assistance. They also reported that the North-east China tiger, *P. t. altaica* (better known as the Siberian tiger) was also gravely threatened in China.

Unless the South China tiger can be saved it will mean that four of the eight tiger races will have been lost in the last half century. The last Bali tiger reported was in 1937, and the Javan and Caspian subspecies have vanished in the last 15 years.

Professor Tan Bangjie, Adviser to Beijing Zoo, declared: "The present status of the wild South China tiger is both alarming and disappointing. The remnant population is so small; the situation facing them is so unfavourable that there is scant hope of natural recovery. To save this precious subspecies from doom, the only hope lies in working out a well-planned breeding programme."

Dr Lu Houji, of the East China Normal University in Shanghai, reported that in 1949 it was estimated that there were 4,000 Chinese tigers. Numbers declined to 150-200 by 1982, and to fewer than 50-80 at the present time.

"Four factors are responsible for the dwindling numbers - loss of habitat from clearing of land for agriculture, timber cutting, over-hunting, and poaching," he said.

"There are two aspects to the people's view of the tiger. From experience, people in rural areas dread the tiger as a killer - a maneater and
a predator of livestock. From the early 1950s hunters were encouraged to kill tigers and a bounty was even paid for each one. In 1977 the Government belatedly woke up to the fact that the tiger population had decreased alarmingly. In an effort to stop the decline, a law was passed forbidding the hunting of all tiger subspecies. Unfortunately, this law could not be strictly enforced and hunting continued. With the scarcity of tigers a black market ensued. Now poaching is the overriding cause of the decline of the tiger."

Dr Lu drew attention to the paradox that the tiger is at the same time a symbol of strength and courage in Chinese culture.

"It features importantly in the epics of great heros. It is featured in the arts, painting and superstition. Tiger parts are highly valued for their medicinal and rejuvenating properties. The Chinese have been using tiger organs for centuries, the greatest demand being for the skeleton, which is used in traditional Chinese medicine. Tiger bone wine is famous in China as a treatment for rheumatism. Other parts are also popular, and so poaching continues to be rampant because of the lucrative black market."

Dr Lu said that two reserves had been established for the Chinese tiger - one in Hunan and another in Jiangxi - while there were also tigers in some forest reserves. A hopeful feature was that these reserves, close to the hills and mountains, could be recolonized if hunting pressure abated, because there was less human activity and predation. There was also abundant prey, largely deer and pig, which had greatly increased in numbers through lack of predation. The problem was that the tigers were scattered, which could affect their breeding and make their come-back slow and difficult.

Professor Tan said that all the Chinese tigers in zoos were captive-born. There were 23 males, 14 females and three cubs. All were third or fourth generation descended from a wild-caught Fujian tigress or from five tigers held in Guizhou, and thus one of the main problems for the captive breeding programme was their close blood relationship.

"One of the major tasks hereafter should be the collection of one or two wild-born South China tigers to improve the bloodline," he said. "Obviously this is a difficult task that needs great care and patience. In fact, there is no definite trace of the whereabouts of the remaining individuals of this rare tiger, so that when there is a new discovery only good protection is permitted. Even if it is necessary to collect one, the slogan must be 'safety first'!"

Professor Tan said that another indispensable prerequisite was the establishment of a studbook to minimize inbreeding. He thought that Chinese zoo workers would be able to complete this work soon. The main burden of a captive breeding programme would rest with the Chongqing and Shanghai zoos.

Dr Xiang Peilun, Director of the Chongqing Zoo, said that the Ministry of Urban and Rural Construction and Environmental Protection had approved a proposal for a scientific research and breeding centre for the South China tiger at his zoo in 1984. The Centre would be under the control of the National Environmental Protection Agency.

He said that a pair of Chinese tigers at the zoo had produced nine litters totalling 21 cubs since 1979. Sixteen survived and 11 had been retained as breeders. He suggested that the proposed centre should also exhibit its tigers in order to promote understanding and support from the public for the breeding programme.
Dr Xiang declared that large funds were required to carry out the programme successfully, and it was hope that there would be international support.

While the Chinese tiger dominated discussions because of the seriousness of its situation, concern was also expressed about the Northeast China tiger (P.t. altaica), better known as the Siberian tiger. Dr Lu said that only about 50 were believed to survive in China. He pointed out that habitat had been decreasing for over a century since the Qing dynasty ban on exploitation of forests was lifted in 1870. There had been severe devastation during the Japanese occupation, while more forests had been cut under economic development plans after 1950. As an example, he said that primeval forest in the Tumen valley in the Changbai mountains (near the Korean border) had been reduced from 14,185 km² in 1870 to only 573 km² in 1980.

"The dramatic loss of the tiger in northeastern China is mainly due to uncontrolled hunting and the loss of favoured primeval forest habitats," he declared.

However, altaica is not in danger as a subspecies, because there are about 300 wild specimens in the USSR in the Primorji-Sikhote Alin area north of Vladivostok. At the same time, a long-term captive breeding programme has produced over 600 pure-bred Siberian tigers in the world’s zoos. Some specimens have been sent to China to improve breeding stock there.

Professor Tan noted that the tigers in northeast China and in the neighbouring USSR territory should be considered one population. A tigress had crossed the border in 1984 and was now in a Chinese zoo.

The meeting heard reviews of the prospects for tigers in other parts of Asia. Here are the highlights:

Bangladesh - Dr Mohammed Reza Khan said he had calculated that there were between 300 and 430 tigers in the mangrove jungles of the Sunderbans, and this constituted a viable population. Mansklaughter, though reduced, was still a problem and he asked how long the people of Bangladesh would tolerate the situation, and what could be done to deal with it.

India - There was general agreement on the success of the India's tiger conservation programme, Project Tiger, and praise for the ecological approach, which had led to rehabilitation of forests and thriving wildlife populations. However, K. Ullas Karanth, an independent researcher, challenged the accuracy of census figures, which showed an increase from 1,800 to 4,000 tigers between 1972 and 1984. He suggested that the 1984 total could not be supported by reported prey populations, and he questioned whether census by identifying tiger pugmarks was reliable.

In reply, Hemendra Panwar, Director of the Wildlife Institute of India and former Director of Project Tiger, expressed his firm conviction that pugmarks could be identified individually by practiced wildlife staff, while admitting that inexperienced people would have difficulty. Having coordinated two censuses he thought that in some places tiger numbers had been over-estimated, and in others under-estimated. Data on prey populations was totally unreliable, he added. Regarding the increase in numbers recorded in the censuses, he said that the area covered had increased each time and complete accuracy could not be expected with over 10,000 people involved in the census over an area of 2.5 million km².
Indonesia - Dr Charles Santiapillai said the Bali and Javan tigers had been driven to extinction, and now the Sumatran tiger had its back to the wall in several areas. But the fact that it had survived showed that it was adaptable, so long as there was sufficient prey, fresh water and cover. He said that if current disruptive trends were not mitigated the tigers, like other Sumatran large mammals, would face an accelerating decrease in range and numbers. The best opportunity for tiger conservation in Sumatra lay in some form of multiple-use pattern of its peripheral habitats, away from core breeding areas. The tiger had had a bad press and many people still looked on it as vermin to be destroyed. But villagers were beginning to understand the role of the tiger in keeping down the numbers of the wild boar, which was a serious agricultural pest.

Malaysia - Mr Mohammed Khan bin Momin Khan, Director General of the Wildlife Conservation Department, said it was estimated that there were about 560-620 tigers in the peninsular. Numbers had been drastically reduced from an estimated 3,000 in the 1930s by the spread of firearms and the rapid opening up of forests for agriculture, mining and human settlement. Human predation on wildlife reduced tiger prey and therefore tiger numbers. He indicated that most existing forests were likely to remain because they were not suitable for agriculture. Existing parks and reserves covered 5,660 km² and more were being established.

Nepal - Dr Hemanta Mishra, ecologist and Secretary of the King Mahendra Trust for Nature Conservation, stressed the problem of conflict between tigers and people. During the past decade wildlife numbers, including tigers, had doubled, after a drastic decline. Acknowledging the success of tiger conservation, he said the achievements were threatened with disintegration unless conservationists failed to grasp the fact that if the basic needs of food, fuel, fodder and shelter for impoverished farmers outside boundaries of tiger sanctuaries were not met, there might be no tigers or wilderness areas left to protect.

Dr Mishra described efforts to minimize local antagonism to tigers and their habitat in Nepal, and concluded that unless rural communities benefitted from programmes parallel to those of wildlife conservation, the tiger would be the loser - "People, not the deer and tiger, elect decision-makers," he declared.

The Long-term Future of the Tiger in the Wild

Dr Chris Wemmer, Director of the U.S. National Zoo's Conservation ad Research Centre at Front Royal, Virginia, took up the bio-political challenges to the tiger's future in a joint paper with Dr J.L. David Smith and Dr Mishra, who had together studied Nepal's tigers for several years. He declared: "Parks and reserves often become attractive nuisances, containing the seeds of their own destruction."

The ecological wealth of a forest reserve tended to spawn a growing community of concessions to foreign tourists and ever-expanding villages, from which came illegal exploitation and degradation of the reserve. As wildlife diminished, conflict increased in marginal habitats used by man and tiger. He made a plea for better integration of community development and park development.

Dr Wemmer said that tiger numbers in many reserves were likely to be below the best estimates for a minimal viable population, and it was estimated that
60-75% of the wild tiger population in the Indian sub-continent lived outside reserves, where continued survival was doubtful. In reviewing the future prospects of the tiger he placed greatest importance on short-circuiting "mega-bureaucratic inertia" in order to bring about efficient solutions to the problems in time, and innovations in managing human populations as a critical element of the ecosystem.

"Given the complexity of the human condition and the rapid rate of environmental change it is an open question whether the challenges will be met in time," he declared.

During other sessions scientists reviewed advances in tiger reproductive biology and in management of captive populations, as well as evolution and systematics of the species.

**Dr George Schaller's Comments**

The pioneer of field studies of the tiger, Dr George Schaller, was not present at the symposium. However, he contributed the following comments later:

Two concepts are being invoked with increasing frequency when discussing long-term management of endangered species. One is that in small populations, inbreeding will lead to reduced fitness and loss of genetic variability. The other is that some species may be maintained and their numbers increased through captive breeding until they can be reintroduced into the wild. Both are valid concepts. However, if these ideas are applied uncritically, there is danger of losing that which we are trying to protect.

Several speakers at the Tiger Symposium revealed a trend in thinking which I find worrisome. Although I was not at the symposium the verbal reports I received from participants prompt these comments.

There is no question that inbreeding could have a deleterious impact on a small population, especially if it remains small for several generations. Conservation biologists now often show an explicit or implicit tendency to relegate such populations to an evolutionary scrap heap as not worth saving. Yet small populations are not necessarily doomed. We know as yet far too little about the genetics of wild populations to justify inaction or a precipitate response with only one conservation option.

I write this with the South China tiger in mind. It now survives in a few small populations of unknown size. No accurate census of this subspecies has been made, no information on prey abundance is available, no evaluation of habitat exists, and no management plan has been produced. Yet the primary conservation goal appears to be captive breeding. Success with captive breeding has already been achieved (though the animals are from a small gene pool), and, given the ease with which zoo tigers reproduce under proper management, the captive population will surely grow. Of greatest urgency is to maintain the wild populations, even if small; this must be the top priority. Two points should be remembered in this context:

If habitat and other resources are available, and if the area is well protected, a species may increase rapidly.

If several small, isolated populations persist, gene flow may possibly be maintained artificially by an occasional exchange of individuals.
The South China tiger is poorly protected and its remaining habitat is threatened. Neither is likely to survive unless prompt action is taken! There may ultimately be no place left for the reintroduction of captive-bred animals.

Various herbivores can, with relative ease, be reintroduced into the wild, whereas large carnivores pose great difficulties. Several small introductions, principally with lions in Africa, indicate several major problems:

Local people strongly object to the reintroduction of a potentially dangerous carnivore.

Young carnivores have to learn to hunt and kill. Several years of trial-and-error training may be necessary before they can support themselves on wild prey, years during which the animals must receive artificial food to survive. A high mortality can be expected with introduced carnivores.

Free-ranging, captive-born carnivores may prey on livestock and threaten people, and then be killed in self-defense. (Reintroduced lions in Africa caused the death and injury of several persons.)

It has been suggested that tigers can be reintroduced into northeastern China in the event that the few survivors there fail to maintain themselves. These tigers have received as little attention as those in southern China, and there is, at present, no hope for their future, even though occasional immigrants from Russia augment the population. To reestablish a viable population from captive stock would be exceptionally difficult, for prey density is so low that tigers must range widely to obtain food. In my opinion, every effort should be made to protect the surviving tigers and their prey rather than express faith in an untested reintroduction scheme.

In sum, if a country truly wants wild tigers, it must protect those it has. Protection is easier, cheaper, and more likely to be successful than reintroductions which are difficult, expensive, and likely to fail. The future of the tiger in China depends on the correct choices being made now.

INTERNATIONAL TIGER STUDBOOK

The International Tiger Studbook is kept by Dr Seifert at Leipzig Zoo in the Democratic Republic of Germany. The Registration Status on 31 December 1984 showed that there were 604 Siberian tiger Panthera tigris altaica (280,324) living in captivity, of which 88 were wild caught.

The Status of the Sumatran tiger P.t. sumatrae was 157 (69,88) living, of which 26 (13,13) were wild caught.

Of 50 Bengal tiger P.t. tigris listed in the studbook as living, 28 (10,18) were white and 22 (11,11) were normal colour. There are more Bengal tigers in zoos, but only those registered in the studbook have provable origin and are definitely pure-bred.
CAT SPECIALIST GROUP MEETING

Cat Group members worked on a draft Manifesto for Cat Conservation at a meeting in Minneapolis-St Paul on 12 April in conjunction with the symposium on tiger conservation. A third of the 72 members of the group were present, along with about 20 others interested in cats, who were attending the symposium. They included the SSC Chairman, Gren Lucas.

The Manifesto is intended as an introduction to the forthcoming International Strategy for Cat Conservation, and also as a basic statement for a brochure to raise funds to support group activities and, eventually, field projects.

A preliminary draft was considered paragraph by paragraph, and a revision was prepared based on the discussions. This is being circulated to group members for further comment before the manifesto is finalised.

Various fund-raising suggestions were made, including the establishment of "Friends of the Cat Group", who, for a small annual subscription, would receive CAT NEWS, the group's newsletter, and any other information of interest.

Tiger Depredation

Hemanta Mishra, Member-Secretary of the King Mahendra Trust in Nepal and Ecologist in the National Parks Department, introduced the problem of livestock-lifting and manslaughter by tigers in the vicinity of the Royal Chitwan National Park. In particular, he asked for views on whether baiting to attract tigers for tourist viewing could be causing the problem.

Several tiger specialists present dismissed the link, pointing out that similar problems existed where there was no baiting. None of them favoured baiting, which was originally a means of hunting tigers and later of showing them to tourists. They expressed the view that it was now possible to view tiger without it. Hemendra Panwar, Director of the Wildlife Institute of India, pointed out that in Kanha National Park, where he was Director for a decade, tiger sightings had increased since baiting stopped. Furthermore, there had been no sign that baiting had any influence on cattle lifting.

Mishra also said that leopard were a problem in Nepal, entering villages at night and taking goats and other livestock. The Government wanted to establish a quota system for sport hunting and trophy export. Without such a system villagers would poison offending animals, but if sport hunting were allowed the organizers could pay villagers not to do so.

African Leopard Quotas

Peter Jackson presented a clarification by the CITES Secretariat of the quota system for leopard trophies in Africa in the light of misunderstandings. In the CITES Secretariat view the quota system was an improvement on the previously existing situation. In the past a country could permit the export of any number of trophies under CITES, provided the importing country certified they were not for commercial purposes. Under the quota system, countries with leopards had voluntarily established limits and controls on trophies.
Lions

The problem of captive breeding the Asiatic lion (Panthera leo persica) was discussed in the context of recent studies by Stephen O'Brien of the US National Cancer Institute, which showed that most of the stock had African blood. Specialists from the Cat Group and from the American Association of Zoological Gardens and Aquariums (AAZPA) are consulting with the Studbook Keeper, Guy L. Smith III, about the future programme and are in close touch with Indian authorities. A total of 239 wild lions was counted in the Gir forest in 1984. The nearby Sakkerbaug Zoo has a pure captive stock of over 35 animals.

Helmut Hemmer reported that Atlas lions (P. l. leo) had been extinct in the wild since the early 1930s and captive stock had been hybridized with other subspecies. He said that lions in the Rabat Zoo, identified as having Atlas characteristics by himself and Paul Leyhausen, had been distributed to zoos in Europe and North America to serve as founding stock to try to reconstruct the original Atlas lion. It was clear that this could not be done completely, but progress had been made and there were now 20-25 lions considered indistinguishable from what was known of the original Atlas lion. The current problem was insufficient space in zoos, and some had decided not to try to breed any more "Atlas lions."

Questioned by Ulie Seal, Chairman of the Captive Breeding Group, Hemmer declared that, except for the Asiatic lion, the Atlas lion was the best discriminated subspecies, and, according to fossil studies, more closely resembled the Palaeo lion of Central Europe in early to middle Pliocene times. He said he felt that the Atlas lion warranted a major commitment by the zoo community.

Snow Leopard

Helen Freeman reported on the recently completed snow leopard project by Rodney Jackson in Nepal (see page 17), and on the current project in Kashmir (see page 37), which is a cooperative project of the International Snow Leopard Trust and the Wildlife Institute of India. Some studies were also being carried out in the USSR, and it was hoped to start a project in Pakistan.

Freeman said that a symposium would be held in India in October 1986.

Jaguar

Peter Jackson reported on a symposium on jaguar he had chaired in Manaus. Wendell Swank of Texas A&M University and James Teer of the R and B Welder Foundation announced that they were undertaking a study of the status of jaguar in Latin America, which they hoped to complete before the end of the year. Sponsored by Safari Club International, which is providing funds via the US Fish and Wildlife Foundation, the report will be submitted to the US Office of Endangered Species.

Swank and Teer presented a similar report on leopard in sub-Saharan Africa in 1977 which led to the leopard's status in US legislation being changed from "endangered" to "threatened", thus clearing the way for hunters to import trophies. They expressed the view that the change in leopard status represented a precedent which could apply to jaguar.
Peter Crawshaw, a Brazilian member of the Cat Group, stressed that jaguar were hunted wherever they came in contact with man, and reduction of habitat was also a major threat. As a result the jaguar had been eradicated from large areas of its original distribution in Brazil. He expressed the view that intrinsic biological limitations inherent to large carnivores, and ecological factors limiting jaguar densities, made sustained harvesting highly unlikely. Under present conditions any legal quota would only increase the number killed illegally, and he felt that with a far from adequate national park system the species could eventually become extinct in Brazil.

Crawshaw's cautious approach was reflected by most representatives from Latin American countries. While they did not say there should be no hunting, they insisted that serious scientific research was required to see whether hunting was possible without damaging jaguar populations. Several said they thought trophy hunting would just be additional to illegal hunting, and expressed fear that it could lead to corruption of wildlife staff because of the large amounts of money involved.

Field biologists said that the ecology of the jaguar resembled that of the tiger rather than the leopard, with which it was often compared.

(See fuller report on page 11)

Cheetah

Peter Jackson reported that Vivian Wilson, a Cat Group member from Zimbabwe, was engaged on a cheetah status survey following a proposal by the National Parks Director, Dr Graham Child, that a hunting quota be established on the lines of that existing for leopard. Dr Child said that cheetah had no trophy value and so they were killed by ranchers because of damage to livestock and the skins secretly burned despite protective legislation. Controlled trophy hunting would encourage ranchers to allow cheetah to survive on their property. Wilson, a member of the National Parks Board, had opposed the proposal on the grounds that cheetah were not so numerous as suggested. He was then commissioned to carry out the survey. (It was learned later that Gary Sharp of the National Parks Department will cooperate with Viv Wilson).

Jackson also reported that Clive Walker had written that there were proposals to change the protected status of cheetah in South Africa, and also in Namibia, where they had caused problems with livestock.

Florida panther

Dr Melody Roelke, a veterinarian who has been studying the Florida panther (Felis concolor coryi), said that only 20-30 remained. She and her colleagues had found an array of medical and potential genetic and reproductive problems. This was combined with human pressures, such as habitat destruction, poaching and losses due to cats being hit by vehicles on highways. The only positive factor was that a great deal of money was being put into Southern Florida by the US Fish and Wildlife Service for land acquisition for the benefit of the panther.

Roelke said that two possible re-introduction sites had been identified in northern Florida, and there was a linked captive breeding programme by the Florida Game Commission. However, only one male was currently in captivity and the question of catching some females was being discussed.

(See fuller report on page 28)
Some notes for the record

Fishing cat (F. viverrina) - Appears to have disappeared from the western coast of India (Ullas Karanth)

Bornean bay cat (F. badius) - Reported sighting by Biruté Galdikas in her orangutan study area in southern Kalimantan, Indonesia

Chinese desert cat (F. bieti) - Only four or five exist in one zoo in China (Tan Bangjie)

Flat-headed cat (F. planiceps) and leopard cat (F. bengalensis) - Both species appear to have benefitted from spread in peninsular Malaysia of oil palm plantations, which attract rats (Mohd Khan)

Rusty-spotted cat (F. rubiginosus) - One sighted in 1985 in southern India. Species may not be so rare as thought (Ullas Karanth)

Golden cat (F. temmincki) - Sometimes used as a substitute for tiger bones in Chinese medicine (Tan Bangjie)

Clouded leopard (Neofelis nebulosa) - Alan Rabinowitz, following a recent visit to Borneo, expressed the view that the cat was not as arboreal as previously claimed. Alan proposes to study the clouded leopard in Thailand.

Another study of clouded leopard has been proposed by Wolfgang Peter, a German biologist. This would involve a comparative study of the cat in Malaysia, where it has to compete with leopard and tiger, and in Sarawak, where it is the top predator.

Biruté Galdikas was reported have sighted a clouded leopard in her study area in southern Kalimantan, Indonesia.

Mexican onza

Helmut Hemmer reported that he was going to Tucson, Arizona, to see photographs and part of the skeleton of a reputed Mexican onza or North American cheetah. He subsequently wrote that it appeared that the specimen was not the North American cheetah, as previously thought, but apparently a completely new type of cat of the genus Puma. A formal note will be published.

JAGUAR

SYMPOSIUM ON JAGUAR AND WILDLIFE CONSERVATION IN NEOTROPICAL MOIST FOREST

A symposium on jaguar and wildlife utilization in neo-tropical moist forests was held at the Tropical Hotel, Manaus, Brazil, 4 April 1986. The symposium was opened by the President of the Amazonas Legislative Assembly, who said that efforts were being made to harmonize development and the building of highways with conservation, which meant defending not only what God had given mankind, but also human welfare. If wildlife did not survive, there would be no survival for mankind.

As Chairman of the session I opened with a brief address, in which I noted the lack of information about the jaguar. The work of Schaller, Crawshaw and Quigley had improved the situation as regards their study areas in the Mato Grosso Pantanal, while Rabinowitz had provided knowledge of jaguar in Belize.
The jaguar was classed as Vulnerable in the IUCN Red Data Book, which meant that it was not considered in danger as a species, but could become so if current trends continued. The skin trade had been reduced markedly by CITES and public campaigns against using spotted cat skins. However, the greatest threat was loss of habitat, which continued.

I pointed out that the jaguar had not declined to the status of the tiger, and the important thing was to see that it did not do so.

The jaguar must be seen as an essential part of forest ecosystems in Latin America and any proposals for exploitation of supposedly healthy populations needed to be carefully examined.

Proposed study of the current biological and political status of jaguar

Dr James Teer (R and B Welder Foundation) and Professor Wendell G. Swank (Texas A and M University) reported that they had been asked by Safari Club International (SCI) to undertake a study of jaguar, similar to that they had done on leopard, which had resulted in the leopard being transferred to "Threatened" from "Endangered" status in the US Endangered Species Act. As a result leopard trophies can be imported into the US if covered by CITES documentation.

SCI made a grant for the study to the National Fish and Wildlife Foundation (established in 1985 to receive donations and grants for fish and wildlife work by the US Department of the Interior) to maintain the credibility of the investigators.

They declared that they were "not setting out to prove or support any organization's or agency's position about the status of jaguar."

Teer and Swank said that they proposed to visit most countries with jaguar, and to contact persons having first-hand information and involvement with jaguar and with factors that influence its future.

In a review, Dr Teer said the jaguar, along with seven other spotted cats, had been given Endangered status mainly because of the large numbers of skins and other products in international trade. He said that the number of skins exported was greatly reduced after the CITES treaty.

He quoted Caldwell (1984) declaring that the Federal Republic of Germany was alleged to be the largest importer and consumer of skins of wild cats, of which the bulk came from South America. Dr Teer said Paraguay seemed to be the present staging area for exports of cat skins from many South American countries.

Noting that the jaguar was a relatively rare denizen of very dense forests, Dr Teer said that it was almost impossible to make a census.

He said the jaguar occurred in a broad belt from northern Mexico through Central America and into South America as far south as Argentina. It still occurred in large blocks of the Amazon basin and in disjunct populations of varying numbers in Central and South America. It had been extirpated in the United States, and there was mounting evidence that it might be extinct in several Central American countries, including El Salvador and Panama.

After reviewing work done on jaguar, Dr Teer said that, almost without exception, the scientific community's prognosis for its future had been unfavourable.
Dr Teer then said: "If it is to be saved, most scientists recommend protection through carefully regulated hunting and through designation of large areas to some form of refuge, where it can enjoy complete protection from habitat loss and competition with man's agricultural interests. Deforestation and development of intensive agriculture in the Amazon Basin is perhaps the greatest long-term threat...conflict between livestock and this great cat certainly occur (and) one can expect ranchers to protect their livestock from its depredations."

Dr Teer concluded by declaring that once the jaguar's habitat had been destroyed it would go with it, because, unlike the leopard, it was not an adaptable species that could co-exist with Man.

Professor Swank reviewed the requirements of the US Endangered Species Act, and said that a portion of the decision to reclassify the leopard as "Threatened" was based on the potential benefits to the species by permitting legal hunting. He said that personnel in wildlife agencies that opened their countries to hunting were "almost unanimous that controlled legal hunting provided more security for the leopard than did complete closure."

He referred to CITES acceptance of leopard quotas based on closely-controlled legal hunting.

He went on: "The case of the leopard has laid the groundwork for an examination of other species on the endangered or threatened list. A word of caution is in order, however, before we proceed. The overall goal must be to the benefit of the species. We need the results from carefully planned and well-executed programmes that can prove beyond a reasonable doubt that viable populations are existing and will continue to exist into the foreseeable future. We need assurances that off-takes, for whatever reason, will not reduce populations or limit the expansion of the species into available and suitable habitat. We must work together to establish regulations that will curtail the harvest of species when it is desirable to do so, and we need to devise means of getting more of the benefits from hunting returned to government wildlife agencies and to local people, who, in the end, are the managers and producers of that wildlife."

The Prospects for Jaguar Conservation in Brazil

by Peter G. Crawshaw, Instituto Brasileiro de Desenvolvimento Florestal (IBDF) and School of Forest Resources and Conservation, University of Florida, Gainesville)

Mr Crawshaw said that although the jaguar had been protected in Brazil since 1967, it was heavily hunted wherever it came into contact with Man, either to protect livestock or to obtain skins. Reduction of habitat was also a major threat, and, as a result, the jaguar had been eradicated from vast areas of its original distribution in Brazil.

The Pantanal of Mato Grosso (where he worked with Dr George Schaller and Mr Howard Quigley) was considered one of the last strongholds of jaguar, but even there only isolated populations remained, mainly in the districts of Pocone and Caceres in the north, and in the Miranda and Bodoquena ranches in the south. Intensive hunting by ranchers had brought about decline — 68 jaguar were killed on one large ranch in eight years.

Mr Crawshaw described his work with Schaller and Quigley, during which nine jaguars were radio-collared and tracked.
Mr Crawshaw declared: "The intrinsic biological limitations inherent to large carnivores and the ecological factors limiting jaguar densities make sustained harvesting highly unlikely. Under present conditions, any legal quota to be harvested would only increase the number killed illegally. With a national park system far from adequate to support viable populations, the species would eventually become extinct in Brazil.

In order to consider any trophy hunting of jaguars in the future, it will be first necessary to reverse the present decrease of the species' populations. This may be accomplished by educational campaigns; improving conditions and enforcement in national parks and reserves; more rigid control of deforestation and poaching by State and Federal conservation agencies; selecting conservation-minded neighbouring ranchers for a cooperative effort towards the recovery of the species in areas where it has been excessively hunted; and the establishing in each state of a research unit to collect data on the status and biology of jaguar. Such monitoring units should also deal with persistent cattle killers, using translocation of individuals, or, when necessary, elimination".

Estimates of Jaguar in the Pantanal, Amazonia and the Guapore River

by Antonio Eduardo d'Andrado de Almeida (safari guide)

In a paper on his experiences guiding ornithological tours in areas where he had once hunted, Mr Almeida declared that at least 50,000 km², mostly in the north and west, was prime jaguar habitat, harbouring an average of one jaguar per 25 km², or a total of 2,000 jaguar. Of the remaining 150,000 km², perhaps 75,000 km² of less favourable habitat, where cover was not so extensive or dense, probably still supported one jaguar per 100 km² or about 750. This made a total of 3,500 jaguar inhabiting the flood plain and its immediate vicinity.

Mr Almeida recounted his experiences and cited instances of jaguar depredation on livestock and of jaguar being shot by ranchers.

Mr Almeida suggested that, in the short and medium term, jaguars were likely to increase in Amazonia because comparatively little forest (perhaps five per cent) had been converted to grassland. In the forest jaguars still found plentiful and easy prey. However, he said that in Amazonian Mato Grosso, jaguars were concentrating around clearings and taking full advantage of the availability of cattle and pigs.

He said there was a important population of jaguar, which he estimated at 1,400, in the basins of the middle and upper courses of the Guapore river and its tributaries.

Status of Jaguar in Costa Rica

by Eduardo Lopez Pizarro, Assistant Director of Wildlife, Ministry of Agriculture and Breeding

Jaguar were found mainly in primary forest below 3,300 m in Costa Rica, Mr Lopez said, adding that there had been occasional reports of jaguar in sub-alpine areas. Between 1940 and 1985 the jaguar's preferred habitat was reduced by 30%. About 70% (11,000 sq kms) was protected as National Parks, National Wildlife Reserves and Forest Reserves.
Mr Lopez said that Costa Rica was turning from preservation of wildlife to conservation through rational use. The decline of the jaguar was mainly due to habitat destruction, and hunting had not been an important factor. Most of the available jaguar habitat was now protected, and there was legislation to promote reforestation.

Jaguar were found in Talamanca (7,900 sq kms), Chambacu (2,741 sq kms), Irazu (1,406 sq kms), Osa (1,246 sq kms), La Amistad National Park (1,900 sq kms), Tapanti Wildlife Reserve and Rio Macho Forest Reserve (920 sq kms), Golfo Dulce Forest Reserve (593 sq kms), and Los Santos Forest Reserve (533 sq kms).

From 1975 to 1985 the Costa Rican Wildlife Service had collected data on jaguar predation on livestock, which was usually in the vicinity of parks and reserves. For example, out of 24 claimed killings by jaguar, 11 were confirmed, and Wildlife staff attributed them to three jaguar, two of them hunting together. He said it appeared that some reported killings were actually the work of a "human jaguar", who wanted to sell the meat.

Permits to kill jaguars averaged 24-30 a year in the last 10 years. The Wildlife Service undertook the work.

Mr Lopez said that the Wildlife Service estimated a population of 150-200 jaguar in Costa Rica and that an offtake of 30 animals would still permit the maintenance of that population.

Jaguar in Venezuela

by Rafael Hoogersteijn and Armando Michelangeli, TERRAMAR FOUNDATION, and Eduardo Mondolfi, FUDEMA

Mr Hoogersteijn reported that the jaguar was in trouble in the north, central and eastern areas of Venezuela, but its status was good in the south, especially in the Llanos, where it had increased in numbers. It had good natural protection in that area. Estates were being persuaded to establish private jaguar reserves with Government support.

He estimated the total number of jaguar in Venezuela as 4,000-5,000, adding that he considered that it was too soon to consider hunting. A study in depth was required.

Jaguar hunting in Mexico

Response dated 16/1/86 to a questionnaire by Alberto Bernal, Chief of the Jaguar Programme of the DFF.

1. Permits were issued to kill 45 jaguar, of which 35 were actually shot.
2. The number of permits to be issued is based on what can be sustained by the population i.e. 10%
3. Permit fees are $M48,000 for Mexicans and $M192,000 for foreigners.
4. Permits are issued consecutively.
5. Permits cover open seasons in the following areas -

Campeche 20 (28/2-27/4);
Jalisco 05 (7/2-30/3);
Nayarit 05 (7/2-30/3);
Quintana Roo 10 (28/2-27/4);
Sinaloa 03 (7/2-27/4);
Tamaulipas 02 (7/2-27/4)

$M230,000 were earned in permit fees.
Comments during debate

Amerigo Tunies, Dept of National Parks and Reserves of Brazil

IBDF favours using natural resources, but considers that research is needed. Even if hunting were legalised, illegal hunting would continue.

Juan Villalba, TRAFFIC South America

Jaguar were abundant in Uruguay until 1830, and one even entered Montevideo in that same year. However, cattle breeding spread throughout the country and the last jaguar was killed in 1886. It meant that the species was exterminated in 35 years, although the damage caused by jaguar was exaggerated. He said rational use of natural resources should really be rational, and research was needed first.

Rafael Hoogersteijn, TERRAMAR Foundation, Venezuela

He was against hunting except of pest jaguars by the landowners affected.

Rick Parsons, Safari Club International

He said there was an emotional reaction against hunting. Each country should decide what to do with its natural resources, not international agencies, such as CITES. Hunting could generate funds for conservation.

James Teer, R & B Welder Foundation, USA

US hunting produces $250 million dollars a year.

Peter Crawshaw, IBDF, Brazil

Hunting could not legally be opened up in Brazil. Controlled hunting could be carried out by farming associations.

Armando Michelangelli, TERRAMAR Foundation, Venezuela

No parallel should made between the leopard and jaguar in regard to hunting, because the jaguar was not adaptable like the leopard. There was probability of corruption if hunting were allowed, and poaching would continue in addition. He also stressed the need for more research.

Eduardo Lopez Pizarro, Assistant Director General (Wildlife), Ministry of Agriculture and Breeding, Mexico

He defended raising revenue from permits to hunt pest jaguars.

Closing Address by Deputy Governor

He declared that the question of wildlife protection and hunting was an important one in Amazonas. He expressed the hope that all natural assets would be preserved because they were not only the habitat of animals but also of Man. To the Indians the forest was a great friend and collaborator, providing food, game and timber. Forests were needed for the world to breathe and to recycle rainfall. There was no longer the erroneous concept that the Amazon forests were the lung of the world, but the suggestion that they were had made Brazilians interested in conserving their forests. Wildlife and forests depended on each other.

He also remarked that "scientists in their ivory towers make way-out statements".
JAGUAR POPULATION ESTIMATES

Brazil - Pantanal of Mato Grosso
Guaçó river basin
Costa Rica
Mexico
Venezuela

3,500 Almeida
1,400 Almeida
150-200 Lopez Pizarro
450 Bernal
4,000-5,000 Hoogersteijn

Jaguar and Livestock in Belize

Research by Dr Alan Rabinowitz of the New York Zoological Society in Belize, Central America, indicated that healthy adult male jaguar can range close to livestock without causing problems. Prior injuries sustained by problem jaguar, often from shotgun wounds, and poor management of livestock appeared to influence jaguar predation. Translocation of problem jaguars may not be a feasible management technique, he says. Two attempts at translocation resulted in jaguar moving back towards the area where they had been captured.

Seventyseven per cent of problem jaguars were males, but problem female jaguar may occur and mothers may bring cubs to kills, and thus account for predation by healthy, subadult jaguar.

Healthy adult jaguar seemed reluctant to cross man-made boundaries into pastures or villages, despite the presence of potential domestic prey. However, pigs placed in the forest were quickly killed by jaguar which never came into nearby villages in search of pigs or dogs. In a Mayan village Indians who allowed their swine to roam into the forest had problems with jaguar predation, while those who kept their pigs within the village never reported losses.

Alan makes the point strongly that indiscriminate shooting of jaguar where there are no problems may create problem jaguar through wounding healthy animals.

ON THE TRAIL OF THE ELUSIVE SNOW LEOPARD

Almost nothing is known about the snow leopard (Panthera uncia) in the wild because its secretive habits, low numbers, sparse distribution and inaccessible habitat have discouraged attempts at study. This project, carried out in Nepal by Rodney Jackson, Principal Investigator, and Gary Ahlborn, Research Associate, and supported by WWF-US, was the first successful attempt at in-depth study of this rare cat, and provides the first information base for home-range, movements, habitat use, activity patterns and other aspects of snow leopard ecology. A summary is given of the report submitted to the Government of Nepal.

Snow leopards are widely but sparsely distributed through the mountains of Tibet, the Himalaya of Nepal, India, Bhutan and Sikkim, the Hindu Kush of Pakistan, the Pamirs of Afghanistan and ranges along the border of the Soviet Union and the People's Republic of China. Except for Nepal, Pakistan, India and Russia, where brief survey work has been undertaken, the leopards' present status, distribution and abundance are unknown.
In 1981, the Government of Nepal approved an application to study snow leopards in west Nepal, in cooperation with biologists of the Department of National Parks and Wildlife Conservation (DNFWC). Field work was completed between January 1982 and June 1985.

The study area was located north of the main Himalaya Range near the Tibetan border in far west Nepal, in the Langu River gorge, among the most forbidding areas in the Himalaya. Elevations range from 2,700 m along the river to over 6,800 m on the Kanjiroba Himal which forms the southern boundary of the study area. The area totals about 300 sq km and includes an "inner core" area of about 80 sq km where most of the field work has been focussed. It is located in the western portion of the Shey-Phoksundo National Park.

Despite its remoteness and rugged nature, the study area provided the following opportunities:

- A dense, undisturbed snow leopard population.
- Sympathy between snow leopard and common leopard limited to a small section of the valley.
- Good, relatively undisturbed bharal and tahr populations. Bharal are primarily restricted to the north bank of the Langu, tahr to the south, however, the two species overlap in the southern core area, enabling us to examine habitat preference and partitioning.
- An opportunity to examine snow leopard habitat use, density and prey utilization under a variety of conditions.

While the Langu Valley is atypical for the Himalaya in that it is essentially unpopulated by humans and ungrazed by livestock, information from this study provides a baseline of snow leopard habitat preferences and requirements under pristine conditions. Obviously, it needs to be followed up with studies in more representative situations.

Primary objectives were to examine, to the extent possible in a four-year study, snow leopard activity and movement patterns, home-range size and configuration, habitat utilization and predator-prey relationships (food habits and basic ungulate prey population dynamics). We specifically attempted to answer the following questions:

- Does the snow leopard's home-area and land tenure system resemble those of other large solitary cats such as the mountain lion and tiger?
- How do individuals utilize their home-range space with regard to resources?
- What are the patterns of movement shown by individuals relative to each other, and what mechanisms operate in spacing behaviour?
- Is sign a reliable indicator of relative population abundance?
- What conservation measures are necessary to protect the species?

Snow leopards were trapped using specially-designed leg-snare traps. Five cats (two females and three males) were fitted with radio-collars and tracked over periods up to two and a half years. Extensive information was gathered on such aspects as home-range size and configuration, movement and activity
patterns, habitat utilization, and scent and visual marking. This was supplemented with some information on food habits, land-tenure patterns, and population characteristics.

Preliminary results indicate that the Langu snow leopards occupy surprisingly small, almost completely overlapping home-ranges, between 10 and 30 sq km, a figure that fails to take into account the substantial surface area due to the rugged terrain. While all individuals regularly used common areas, their occupancy was staggered in time, thus confirming the species' solitary nature. They may remain in one area for up to ten days, before moving often to the opposite end of their range, some 5 or 7 km away. Typically snow leopards move less in a day than one km as the crow flies, but their travel routes are sinuous because they move along sharp ridges or the base of cliffs, thereby covering much greater distances in search of prey. Leopards are most active around dawn and at dusk, but are not averse to daytime travelling where undisturbed by man.

The Langu snow leopards exhibited a strong preference for broken terrain, especially cliffs, usually bedding within 50 m of an edge. Cliffs were used in excess of their occurrence in the study area, while even-surfaced terrain was under-utilized. Elevations above 4,200 m were used less than expected, and we found no evidence of seasonal movements or separate summer and winter home ranges.

By repeatedly visiting transects, we found that cats of both sexes mark extensively, leaving such signs as scrapes, scats and scent at prominent locations throughout their range. These serve as "calling-cards", important in an essentially solitary species such as the snow leopard that avoids close contact with others except during the brief mating season. On the average, radio-tagged snow leopards of both sexes were separated by at least 2 km on the same day. Sign may be extremely valuable in indicating the presence and relative abundance of the species in other areas, a crucial indicator since the snow leopard's vast range and inaccessible terrain preclude searches of the intensity that are possible for, say, the tiger.

Snow leopard numbers were estimated at 5-12 animals per 100 sq km, a figure that compares favourably with Schaller's (1977) estimate of about one cat per 100 sq km for Shey Gompa area, and Mellon's (1984) estimate of about one cat per 150 sq km for Ladakh, India.

The Nepalese Counterpart, Karan B. Shah, undertook detailed studies of the blue sheep or bharal (Pseudois nayaur), the principal prey of the snow leopard in much of its range. His work should contribute substantially to knowledge about this unusual Tibetan ungulate, considered by scientists to be more goat-like than sheep-like in its behaviour.

Partly on the basis of information from this study, Nepal established its largest national park, the Shey-Phoksundo National Park encompassing some 3,555 sq km of prime habitat for rare species like the snow leopard, musk deer, wild dog, goral, and possibly the very rare Tibetan sheep or nayan (Ovis ammon hodgsoni).

The second phase of the research will involve the preparation of a management plan for the Shey-Phoksundo National Park and wide-ranging surveys of snow leopards in other parts of Nepal, as well as in Pakistan, using techniques developed in this pioneering project. The primary goal will be to determine accurately the status of populations both within and outside existing parks and reserves throughout the region, and to promote conservation
area multiple-use planning strategies. In this respect the near-mystical snow leopard could serve as a sensitive indicator of a healthy mountain ecosystem and a symbol of man's commitment to its conservation.

Preliminary recommendations for the management of the snow leopard and its prey are provided for the Langu Valley segment of the Shey-Phoksundo National Park. Our request for permission to examine the remaining 90% of the park is under consideration. The guidelines provided below therefore only to the far mid-western corner of the park, namely the Langu Gorge from the Ruka Khola west to Bailung Khola immediately east of Dolphu. This is the only village located within the park in our area.

The Langu Gorge is unique in terms of the density of snow leopard it supports; numbers are greater than reported anywhere else in the cat's range. It therefore provides Nepal with the opportunity to ensure that this endangered species continues to exist under near pristine conditions in at least one area.

Management Objectives

- To ensure the protection and ultimate restoration of all natural communities within the affected area. Alpine and subalpine habitats in this area are especially vulnerable to disturbance because of steep slopes, shallow soils and semi-arid climatic conditions. The Langu Gorge is essentially uninhabited by man and consequently reflects wilderness conditions rare in Nepal's mountain environment.

- To provide special protection for endangered species, particularly the snow leopard and musk deer. Protection of these species requires that hunting and livestock grazing be strictly controlled.

- To implement measures to protect soils, rangeland resources, fuelwood and watersheds with particular emphasis on the area around Dolphu village.

- To respect traditional rights of villagers, with controls for those activities affecting the area's fauna and flora.

- To secure the cooperation of local people as a vital step in properly managing the Park's resources. An important objective is to facilitate conservation education in schools and among all villagers, including community leaders.

- The dangerous terrain of the Langu Gorge does not lend itself to the promotion of trekking, although Dolphu and Wangri could be considered in the future as part of the region's resource base. However, the Karnali Zones' remoteness and lack of basic facilities severely limits its foreseeable potential for tourism. The Langu Valley is a restricted area.

Recommendations

The establishment of a Panchayat Conservation Committee to assist in wildlife, rangeland and forest resource protection, and to participate in enforcing the park regulations, is strongly recommended. The committee could play an invaluable role in implementing much needed grazing, firewood, watershed and wildlife protection plans, especially in the rapidly deteriorating environment around Dolphu village. Participation by village leaders is an essential ingredient in the effectiveness of protective measures, especially as the local villagers depend upon Park resources and have traditionally used them.
Hunting should be controlled in accordance with the rules of the Department of National Parks and Wildlife Conservation. While a total prohibition on musk deer harvesting is essential, it is unrealistic to attempt to enforce a ban on unthreatened species like the bharal and tahr. Local populations could sustain harvest rates of about 10% without harm; therefore some hunting under license is recommended for the trade-off it would bring in village cooperation. However, the practice of hunting with poisoned bamboo spears should be discouraged, because it is unselective in the species killed and snow leopards are equally vulnerable.

Livestock depredation by snow leopards is apparently not a significant problem, in contrast to livestock losses from the forest leopard (Panthera pardus). The villagers did not seem to perceive the snow leopard adversely, but repeatedly expressed their desire to control the common leopard.

Snow leopard populations, prey species and their habitat are best protected by controlling hunting and by ensuring that livestock grazing of presently ungrazed rangeland is not permitted. As long as native ungulate populations persist at present levels, livestock depredation by snow leopards should not develop into a problem. The depletion of native prey species and retribution by livestock herders are judged as significant factors in the decline of the snow leopard throughout the cat's range.

Snow leopard population trends should be monitored by undertaking sign surveys every two years, using carefully placed, permanent transects and standardized techniques. Surveys must be made during the late winter (February–March), and should follow the methodology developed during this study.

Snow leopards can only be preserved by managing intact populations, i.e. by considering the population of the Shey–Phoksundo National Park and adjacent buffer areas as a single unit. Thus adequate management recommendations cannot be provided until a survey has been undertaken to determine the species' status and distribution in the whole park. Integral to this investigation is a survey of prey populations, competing predators such as the wolf (Canis lupus), habitat mapping and characterization, examination of habitat edge and interspersion, a determination of livestock grazing patterns, and examination of traditional man-wildlife interaction patterns with special emphasis on hunting, livestock depredation and grazing needs. Use of a habitat suitability model to evaluate habitat potential is recommended.

Such aspects as minimum population size, reserve (management area) size and configuration, genetic diversity, dispersal corridors and habitat suitability cannot be addressed solely from the Langu information base; a wide-ranging, comparative survey is an imperative requisite for the development of sound management recommendations.

Annual or biennial censusing of bharal and tahr populations should be undertaken in selected areas. This is the best way of alerting DNPWC to possible declines and provides the only sound means upon which to base the issuance of hunting licenses. Counts are best undertaken in two seasons; rutting season (December–January) and the lambing season (late May–June).

The general inventory of the fauna and flora should be continued.

Studies should be undertaken of the effects of burning on bharal and tahr rangeland before permitting local villagers to set fire to inner gorge areas.
We strongly recommend that DNPWC develop a National Snow Leopard Conservation Plan, in order to manage better this unique species as well as its high mountain habitat.

Nepal has demonstrated its keen interest in conservation by establishing six mountain national parks. With one possible exception, all are too small or too populated by man to support significant snow leopard populations. Conservation of this species can only be achieved by protecting habitat through all means possible, including sound land-use and management outside the narrow confines of a national park. Large predators like the snow leopard are sensitive indicators of environmental quality; ecological homeostasis is strongly correlated with population size and land-use patterns. By addressing the needs of this rare species and its prey, the habitat requirements of many other plants and animals that share the same ecosystem are met. Thus a National Snow Leopard Conservation Plan would also protect other species.

The snow leopard stands as an internationally recognized symbol of the high Himalayan ecosystem. By promoting wildlife surveys as suggested above, Nepal not only confirms its commitment to conservation, but provides outstanding leadership in the region.

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SNOW LEOPARD INCLUDED IN MIGRATORY SPECIES CONVENTION

At a meeting of the parties to the Convention on Migratory Species of Wild Animals a decision was taken to include the snow leopard Panthera uncia in Appendix I, which covers endangered species. This commits range states to endeavour:

a) to conserve and, where feasible and appropriate, restore those habitats of the species which are of importance in removing the species from danger of extinction;

b) to prevent, remove, compensate for or minimize, as appropriate, the adverse effects of activities or obstacles that seriously impede or prevent the migration of the species; and

c) to the extent feasible and appropriate, to prevent, reduce or control factors that are endangering or are likely to further endanger the species, including strictly controlling the introduction of, or controlling or eliminating already introduced exotic species.

Range states must also prohibit taking of animals listed in Appendix I, unless for scientific purposes; to enhance the propagation or survival of the species; to accommodate the needs of traditional subsistence users; or extraordinary circumstances so require.

The snow leopard is the only member of the Felidae to be included in the Convention appendices, and although the extra protection is welcomed, many feel that the snow leopard, and cats generally, do not fit the convention's definition of a "migratory species":

the entire population or any geographically separated part of the population of any species or lower taxon of wild animals, a significant proportion of whose members cyclically and predictably cross one or more national jurisdictional boundaries.
The other mammals included in Appendix I are the monk seal, Grevy's zebra, vicuna in Peru, Barbary deer, kouprey, yak, addax, Cuvier's gazelle, dama gazelle, dorcas gazelle in North Africa, and rhim gazelle.

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**LESSER CATS IN EASTERN INDIA**

Little is known of the lesser cats because of their secretive habits, and the dense vegetation where they usually live. India, and particularly the eastern region, is especially rich in species, and scientists of the Zoological Survey of India, led by Dr Biswamoy Biswas, have been carrying out surveys in the north of West Bengal State and the Himalayan State of Sikkim. They report diminishing numbers of wild animals and considerable habitat destruction, and they recommend measures that need to be taken to improve the situation. The following is an abbreviated version of their report.

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**The Survey Area**

Sikkim, with snow-clad peaks, swirling cloud-covered labyrinthine valleys, torrential rivers and streams flowing through deep gorges, presents a distinctive environment with hilltops and steep slopes covered with magnificent dense forest that abounds with varied and interesting animal life. Of the total area of about 7325 km², with altitudes varying from about 250 m to as high as about 8,550 m, about 35% consists of forests of luxuriant tropical and temperate vegetation. In such an interesting habitat animals such as the red panda (Ailurus fulgens), civets, martens, weasels, spotted linsang (Prionodon pardicolor), binturong (Arctictis binturong), various lesser cats (Felis marmorata, F. bengalensis, F. temmincki), clouded leopard (Neofelis nebulosa), snow leopard (Panthera uncia), leopard (Panthera pardus), musk deer (Moschus moschiferus), serow (Capricornis sumatraensis thar), goral (Naemorhedus goral), Himalayan tahr (Hemitragus jemlahicus), bharal (Pseudois nayaur), nayan (Ovis ammon hodgsoni), flying and other squirrels, etc., still survive. However, increasing disturbance in the forest has disastrously affected the habitats of these animals, resulting in great depletion of their populations. Many of them are now listed as endangered.

Sikkim has long been known as "the land of rice", and the increasing population in the state has caused pressure on the hill slope forests, converting them into extensive terraced paddy-fields and plots for ever-developing cash crops such as cardamom and ginger. In addition to the development of new habitations, continued road-building work, construction of dams and hydel power stations etc., depletion of the forest has been aggravated by exploitation of timber and firewood to meet the basic demands of domestic life. Even privately-owned forest areas at many places have been converted into barren hill slopes. All this has been continuing for many years without any attention to soil conservation. Moreover, natural soil erosion and subsidence during rains have increased.

The upland forest habitat in Sikkim, particularly in the northern areas, very often also suffers from the overflow of glaciers and heavy snowfall. Through combined natural effects and man-made causes, such as the human population explosion, the forests in most of Sikkim have now become restricted to hilltops and riverine areas only, leaving the middle hill zones as virtually barren land, used mostly for cultivation and human habitation.
All these factors have ravaged the forest ecosystem in many areas, with obvious shrinkage in the populations of many animals. The surviving herbivores, such as the tahr, goral, barking deer etc., are consequently under local hunting pressure in the name of crop protection. The natural predators like the lesser and the larger cats, civets, martens etc., faced with paucity of wild prey, have adapted to lifting of village poultry and cattle. This leads to their being killed by the villagers. In addition, the traditional illegal hunting by village hunters for pelts or furs is still in vogue. Disturbance in the natural habitat due to illegal encroachment, such as grazing of livestock in the Reserved Forests, is also a serious problem in conservation.

In northern West Bengal the reasons for habitat shrinkage and exploitation of forest and animal wealth are almost identical to those in Sikkim. While the soil erosion problem here is less acute, the forest ecosystem often becomes disrupted during heavy rains, due to flood or submerging of the forest floor. However, in spite of massive denudation of primary forests in northern West Bengal, some patches are still left undisturbed. Some of the areas where the Forest Department now is developing new plantations, mostly monoculture of exotics, have little or no undergrowth. In several areas, whatever undergrowth appears is burnt off by local villagers to grow their own crops, so that there appears to be mutual cooperation between the Forest Department and the local people in raising new forest plantations and food/cash crops.

In addition to local interference, there are extensive tea plantations even around Reserved Forests. Disturbance created by road construction, plying of trucks through the forest carrying timber, firewood, etc., is increasing day by day. Under these conditions there is obviously a scarcity of natural food and shelter for the smaller predators like the lesser cats, and they have to face keen competition for their existence with other carnivores such as the leopard, clouded leopard, various civets, etc. Furthermore, illegal killing of animals for their pelts continues virtually unchecked. Information on the trapping of wild cats, even for consumption as food by some tribal people, has also been recorded by us. It is indeed a wonder that in such a complex situation, various animals, including the lesser cats, still survive, albeit in small pockets.

**Status of the cats**

The leopard cat (*F. bengalensis*) was recorded from almost all the areas in which work was done. The species appears not uncommon in Sikkim, up to about 2,936 m. In northern West Bengal, in the altitudinal range of about 61 to 533 m., this cat is less common than in Sikkim. From our sighting records of lesser cats, it is evident that in northern West Bengal the jungle cat (*F. chaus*) fares better than the leopard cat. On the contrary, in North, East, South and West Sikkim Districts, the party could not locate the jungle cat except at a place in Ramman River Valley, near Naya Bazar.

Information on the occurrence of the marbled cat (*F. marmorata*) was collected in a few places in North and West Sikkim Districts, but we were unable to see any. However, during investigation carried out in the Rabadanche Reserve Forest at Pelling, West Sikkim, in 1982 and 1983, we discovered pug-marks of a cat, most likely a marbled cat. Information on the sighting of a marbled cat on a tree near a stream during the daytime at Rangtalo near Chungthang in North Sikkim in November 1982 was also noted. This cat, being very much adapted to the temperate climate of the hills, obviously does not descend to the plains of northern West Bengal. However, it probably occurs in the Neora Valley and Rangpo areas in the Kalimpong Forest Division of West Bengal.
The presence of the fishing cat (F. viverrina) was not confirmed in Sikkim. In northern West Bengal a few sighting reports of this cat at Jaldapara Sanctuary were noted from the replies of forestry officials and local people to our enquiries. On the muddy bank of the Sil Torsa River there, we noticed the pugmarks of cats similar to those of the fishing cat. Thus the marbled cat and the fishing cat remain elusive both in Sikkim and in northern West Bengal.

Sighting reports of the golden cat (F. temmincki) at a few places in Sikkim and northern West Bengal were collected. A specimen collected by the Forest Department, Sikkim, from Naagdok area, about 10 km south of Gangtok, and exhibited in the Museum of Gangtok Zoo Park, has also been examined. Probable pug-marks of this cat were noticed at Lachung in North Sikkim and Chapramari area in northern West Bengal. In a recent field trip to Sikkim in January-February 1983, while scanning the hill slope forest at night around Legship in West Sikkim, we spotted what was probably a golden cat for a short while. Judging from the response of people shown pictures of the golden cat, it seems that it occurs in the area, but this needs further confirmation. From our study, however, it appeared that this species is very rare in Sikkim and northern West Bengal, and is indeed threatened.

Conservation measures

In northern West Bengal a few remaining primary forest zones have been declared as sanctuaries (viz. Jaldapara, Gorumara, Chapramari, Mahananda, etc.). Some areas have also been recognized as Reserved Forests, and the Neora Valley in the Kalimpong Forest Division has been strongly recommended as a Biosphere Reserve, as a gene pool centre for preserving tropical as well as temperate flora and fauna.

In Sikkim, in addition to the Reserved Forest areas in the States, the Kanchenjunga National Park encompassing an area of about 850 km² was established in 1977. Another Sanctuary has also been proposed near Rabongla in South Sikkim.

The Forest Departments of Sikkim and West Bengal have adopted a number of measures to stop poaching of animals and felling of trees. All these are encouraging endeavours indeed, but not enough for the survival of the existing fauna, particularly in Sikkim, where regular patrolling is difficult due to the rugged terrain.

As regards conservation of the lesser cats, further detailed and urgent investigation needs to be carried out to identify the viable populations of these animals and their ecological requirements before measures for their survival are formulated. However, at the moment, to check the process of depletion in the number of wild animals, including that of the lesser cats, and to maintain ecological equilibrium, scientific methods of exploitation of habitat should be adopted, together with large-scale afforestation (not monoculture with exotics) and steps to arrest hill slope erosion and/or flooding in the forested areas of the plains. Areas around sanctuaries and reserves should be afforested so as to create buffers and multiple-use corridors, wherever possible, to provide additional habitat and offer some scope for dispersal of wild animals. In addition, public awareness and interest concerning the importance of the wild animals should be created by educating the common man through institutions and village councils so as to obtain their cooperation in measures for the conservation of wildlife.
We recommend that a captive breeding centre for selected endangered animals, such as the marbled cat, red panda, monal pheasant etc. be established at a new Zoo Park at a suitable place in North Sikkim.

CARNIVORE STUDY IN INDIA

Ullas Karanth of the Centre for Wildlife Studies, Mysore, and Dr Mel Sunquist, of the Florida State Museum, Gainsville, are embarking on a study of the ecological relationships and resource use in the carnivore/herbivore community of Nagarhole National Park, Karnataka, India, with special reference to the management of large predators and their prey. The project will be carried out with the collaboration of the Chief Wildlife Warden, Karnataka Forest Department.

In their project document they state: "Many of the sanctuaries and national parks established in India to arrest the rapid loss of natural habitats and wildlife consist of tropical moist/dry deciduous forest habitats that support a diverse assemblage of large carnivores, such as tiger, leopard and wild dog, and an array of herbivores. However, most of these reserves are small (500-1,000km²) and are surrounded by lands used for forestry, agriculture, livestock grazing and human settlement. Management has been oriented primarily towards strict protection from biotic factors, such as fire, grazing, logging and poaching. This has resulted in significant increases in large ungulate and predator populations, but conflicts have arisen between some wildlife species and human interests in many areas adjacent to national parks and sanctuaries. Mitigation of these conflicts depends on improving knowledge of the ecological relationships and resource use patterns of the species involved."

The proposed study, to continue for several years, will focus initially on collection of base-line data on densities, habitat-use patterns and ecological relationships of large herbivores and their predators, and redefine methodologies applicable to many of India's parks and reserves. In the second phase the study will use radio telemetry for an intensive study of the carnivores.

CARNIVORES IN CAPE PROVINCE, SOUTH AFRICA

Little can be done to improve the conservation position in Cape Province, South Africa of lion, cheetah, hunting dog and spotted hyaena outside large conservation areas, according to Chris Stuart, together with I.A.W. Macdonald and M.G.L. Mills in a paper in Biological Conservation 31 (1985).

The authors state that hunting dog Lycaon pictus is extinct as a breeding species and lion, cheetah and spotted hyaena are represented by only small populations in the Kalahari Gemsbok National Park. The smallest isolated population of lions existing naturally is one re-established in the 900 km² Hluhluwe-Umfolozi Game Reserves Complex in Natal, but it has to be managed intensively and its long-term viability is questionable. Genetic management will probably have to be undertaken in the future.

There are small populations of leopard in the Kalahari Gemsbok Park (about 100) and also in Southern and Western Cape Province. The highest density in Cape Province is probably in the coastal mountain chain from Van Rhynsdorp in the northwest to King William's Town in the east.
A total of 110 leopards were killed legally in the Cape Province between 1977 and 1980, most of them in the South West Cape. An unknown number are killed illegally each year.

The leopard is a problem predator in parts of Cape Province. Payment of stock-loss compensation and a total ban on leopard hunting in the province is impractical and would result a dramatic increase in illegal hunting by farmers.

It is suggested that a "safe zone" or "open sanctuary" for leopard should be considered in the Southern Cape Province. The area has large tracts of State-owned land, minimal conflict with farming activities and a favourable attitude towards conservation by the majority of landowners.

lynx

Lynx, which became extinct in Switzerland at the turn of the century, have been reintroduced in recent years, and there are now about 50 in the country. The public has not totally accepted the lynx, and hunters complain of competition for deer and other game.

Drs Urs Breitenmoser and Heinrich Haller of the University of Bern, Switzerland, who have been studying spatial organisation and feeding habits of lynx in the Swiss Alps, report that ungulates gradually adapt to the presence of lynx, but their space requirements increase.

At present the lynx in the northern Alps occurs mainly in large forest areas of over 500 km², where the population density is estimated at about one adult to 85 km².

Home ranges of four lynx in the northern Alps, where the lynx was first established, varied from 450 km² to 275 km² for males and 135 km² to 96 km² for females. In the Valais (Central Alps) an adult female was tracked over 46 km². The home range of one female was almost completely overlapped by that of a male.

Occasionally lynx roamed outside their home ranges, especially males during the mating season, and one male ranged over 1,860 km². A young female, which dispersed and lived with a range of only 5 km² in a valley not used by lynx before, probably captured prey more easily because it was a new area.

Breitenmoser and Haller found that lynx in the study area fed mainly on the two smaller ungulates. Eighty-eight prey items included 48 roe deer, 30 chamois, five hares, two domestic sheep, two marmots and one red squirrel. Analyses of faeces showed that neither small rodents nor birds were of any importance as lynx prey. A male and a female hunting in the same area showed different preference in killing roe deer and chamois (12:14 and 21:7 respectively). Distances between consecutive kills varied from five to ten kms. Exploitation of killed ungulates in undisturbed sites was 88%, close to civilisation 62%. Adult lynx killed one ungulate every 6.6 days, a female with two cubs of 10 months one every 2.7 days.

The yearly consumption of one lynx was estimated at 60 roe deer or chamois, and the total consumption in the study area was 3%-9% of the ungulate population. It is considered that feeding strategy i.e. surprise attack, is one of the main reasons for the large home ranges and the low population density of lynx in the northern Alps.
Lynx in Finland

A study by Antero Suoranta and Louniais-Hämeen Luonto of ten years of game death records in southwest Häma, Finland, where lynxes have survived naturally, showed that 25% died through attacks by dogs, 15% died of starvation, 11% fell victim to road traffic, 9% were poached, and 7% drowned. Only 5% was killed by lynx.

FLORIDA PANTHER

Only a few dozen Florida panther (F. concolor coryi) are believed to survive in the face of continually mounting human pressure.

Dr Melody Roelke of the College of Veterinary Medicine, University of Florida, found poor physical condition in many of them, especially females, during a three-year study funded by the Florida Fish and Game Commission.

She says the most likely causes are poor nutritional status, chronic blood and iron loss (from internal and external parasites and fetal development in females), and chronic disease. The poor physical condition of females would account for the apparent low rate of reproduction.

Roelke says several potentially pathogenic viral agents were identified. Antibody indicating prior exposure to feline panleukopenia virus, a highly contagious devastating viral disease of all felids, was found in 12 of 14 panthers and 17 or 34 bobcats tested. Antibodies to calicivirus, a respiratory pathogen, was found in seven of 14 panthers and 12 of 34 bobcats.

Several carnivore species which share habitat with the panther, including bobcat, otter and raccoon, might be acting as viral reservoirs for the panthers. In addition, internal and external parasites may be adversely impacting the panthers.

Analysis of semen from three wild Florida panthers indicated they had highly pleiomorphic spermatozoa, with abnormal sperm forming more than 93% of the total count, whereas semen from a limited number of captive cougars of various subspecies have considerably fewer abnormal sperm.

Road Crossings for Panther

The US Federal Government has agreed to include panther crossings in the design of Interstate 75, which will cut through the heart of the Florida panther's habitat.

Plans call for 36 underpasses to permit the animals to cross under the highway, and fences to keep them from wandering onto the road.

In a recent two year period four panthers were killed by cars on the Alligator Highway, which Interstate 75 will replace.

Interagency Panther Commission Proposed

Dr Douglas Miller, National Wildlife Federation's Vice-President for Research, Education and Development has proposed that there should be an Interagency Panther Commission. At a meeting with representatives of state and federal panther management agencies, he also proposed application of cumulative effects analysis to panther habitat management, and initiation of research on panther and prey species in Everglades National Park.
Maneater shot in Nepal

A tiger, which had killed three villagers in the Modhi Khola area, near the Royal Chitwan National Park in Nepal, was shot in March. Two senior shikaris (hunters) belonging to the Smithsonian-Nepal Terai Ecology Project, Man Bahadur Lama and Bishnu Bahadur Lama tracked the tiger for two weeks before they could shoot it. An autopsy showed that the tiger was old and in relatively poor condition. In the past few years several tigers have caused problems in the neighbourhood of the park and have had to be eliminated.

INTERNATIONAL HERALD TRIBUNE, THURSDAY, MARCH 27, 1986

Tiger Attacks on Humans, Livestock in Soviet Prompt Action

By Celestine Bohlen
Washington Post Service

MOSCOW — A senior engineer at the Dniepropetrovsk tractor factory was the first to spot the tracks in the fresh snow, right there on Borodinsky Street in central Dniepropetrovsk, next to the bloody remains of a half-eaten dog.

Specialists were summoned. They measured the huge paw prints — each pad was four inches (10 centimeters) wide — and confirmed the stunning news. For the first time in a hundred years, a wild Amur tiger was prowling the streets of the biggest city in the Soviet Far East.

According to reports in two Moscow newspapers last week, a hunting party was organized the same day. All roads to Dniepropetrovsk were closed off, and a helicopter was commandeered for the chase.

Toward evening, the tiger finally was spotted hurtling near a trolleybus stop on the city’s outskirts. When he jumped out, he was shot to death.

According to the newspaper Sakhavaya Zoria, the young beast measured nearly 10 feet (about three meters) and weighed more than 450 pounds (250 kilograms). The drama in Dniepropetrovsk, where the tiger is the city symbol, was only one of several tiger sightings this winter in settlements in the Soviet Far East.

There have been numerous reports of attacks on livestock and a few on humans, according to the Soviet press. In recognition of the problem, a new division has been created in the Russian Republic’s hunting directorate that will supervise control of large predators.

As tigers creep out of the taiga, the subarctic coniferous forest, and into villages, towns and cities to prey on dogs and livestock, experts have become alarmed, both for the once-endangered big cats and their potential prey.

"Many people go skiing in winter in the wooded area around Dniepropetrovsk," reported the local correspondent of Sakhavaya Zoria, the Soviet agricultural newspaper. "Their lives are in danger."

The trend is explained in part by the growth in the Amur tiger population, found mainly in the Primorsky region of eastern Siberia. An endangered species, listed in the Soviet Union’s book of protected animals, the Amur tiger has recovered from a critical period before World War II, when its numbers dwindled to a mere 30 in last year the population had risen to 290, according to the newspaper Trud.

Still, the tiger population is considered “minimal” for the survival of the species, experts are reporting as saying. The problem, therefore, is not the number of tigers, but their appetites.

As the wildlife of eastern Siberia has developed, the tiger’s sources of food have dwindled. The felling of the forests and widespread poaching have reduced greatly the numbers of wild boar and deer, which are the tiger’s natural prey.

Blessed in the wilds by human competition, the tigers have turned to more domesticated sources, stealing by night into collective farms or feeding off dogs abandoned by their owners at dachas, or country retreats.

One farm in the Primorsky region reported 11 pigs killed by a tiger in a single night in January.

“Cases of attacks on livestock, even people, have grown more and more frequent,” Sakhavaya Zoria noted. “This caused specialists in the main hunting directorate to create a service for the control of large predators such as tigers, snow leopards and the white-cheeked deer.”

One suggestion is to create a protective zone for tigers and domesticated animals in existing game reserves, and to open new reserves.

“The government is also trying to ensure that the rare predator lives only in the taiga and that its visits to the towns and villages should cease,” the newspaper concluded.

But already, the newspapers have carried accounts of attacks on humans. In one case, two tigers were reportedly shot and killed — to the dismay of protectionists.

Although tiger hunts were outlawed 40 years ago, permits apparently are given to shoot animals when they range near populated settlements. Last year 20 such permits were granted, according to Trud.

LIVESTOCK TOLL FROM DOG ATTACKS

Cats, especially the big cats, often cause problems by taking livestock, arousing calls for their local elimination, as well as furnishing arguments against conservation. In this context it is interesting to learn from Britain’s National Farmers’ Union that more than 10,000 farm animals are attacked by dogs each year and only one in three survive.

Figures showed that 3,000 sheep were killed or seriously injured by dogs in England and Wales in 1983, as well as cattle, poultry, pigs, goats and farmed deer. It was stated that 50% of the incidents go unreported.

A spokesman of the National Farmers’ Union said that no reliable estimate could be made of the number of offspring lost by animals aborting following attacks by dogs.

APPEAL: Similar information gathered from competent authorities in other countries would be welcome.
TRADE

CITES Technical Committee Meeting

The CITES Technical Committee, which met in Lausanne 23-27 June, 1986, endorsed a working group recommendation for urgent studies on the status of a number of species, including five South American cats - Felis geoffroyi, F. colocolo, F. pardalis, F. tigrina, and F. weidi. It was noted that work had already started in Bolivia, where a survey is being carried out by Dr. Jose Teihno.

CITES and the European Economic Community

World Wildlife Fund/US has called for the continuation of detailed reports by European Economic Community (EEC) members on their implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), despite the EEC's proposed accession to the convention as a single Party.

In a report prepared for the US State Department as a preliminary assessment of the situation, WWF/US said that the accession was based on the premise of a uniform, harmonized system throughout the EEC for controlling external wildlife trade, which could theoretically justify relaxing border controls between member states and eliminate the need to report on CITES trade between these states. However, WWF/US points out that the CITES Secretariat Report for 1984 observed: "Some major importing countries appear to be taking advantage of shortcomings on the part of the exporting countries by authorizing the importation of illegal goods for so-called economic or legal considerations."

The annex to the Secretariat Report commented that illegal trade was flooding into the EEC through weak points and "the implementation of CITES in the EEC is obviously extremely poor in this respect."

The Secretariat singled out France and Italy as having major enforcement problems, and said that freeports were a "significant loophole."

"It is a fact that CITES controls are not exerted in such freeports and, in this respect, the Hamburg Freeport in the Federal Republic of Germany is known to be a major conduit through which CITES specimens enter the EEC without CITES documents and without CITES controls.

In a highly-critical report, which was presented to a meeting of the CITES Technical Committee in Switzerland in June, 1986, WWF/US said that the EEC probably represented the world's largest market for cat and reptile skins and certain other unfinished wildlife products, and thus its role could be critical in ensuring effective worldwide enforcement of CITES.

Some points relevant to felids in the report are as follows:

Paraguay is cited as the country of origin for numerous shipments of wildlife, many of which contained (sub)species not occurring in Paraguay, which, in any case, banned wildlife hunting and export in 1975.

In 1985 shipments of several thousand spotted cat skins from Bolivia were accepted for import into France, despite a decision by the CITES Standing Committee to refuse felid skins from Bolivia until that country
established necessary control measures. The skins were subsequently transported the Federal Republic of Germany, where the authorities ordered seizure. However, because they could not legally refuse to accept valid CITES documentation from a CITES member state (in this case France), the order could not be upheld and the skins are now on the market.

French Guiana is a funnel for illegal wildlife from South America to the EEC because shipments constitute internal trade to France and therefore to the EEC.

Spain is due to become a CITES party on 28 August 1986, but when the country joined the EEC on 1 January 1986 "apparently enormous stockpiles of cat skins, reptile hides and other wildlife products became, for the most part, freely available to all EEC member states."

Imports to France of Paraguayan origin included skins of 1,000 *F. geoffroyi*, 7,167 *F. tigrina*, and 3,257 *F. wiedii*, all imported via Argentina and probably illegal in the light of the Paraguay's ban on hunting and export. The skins of 2,600 *F. pardalis* imported directly from Paraguay, probably illegally, may have been from *F. p. mitis*, an Appendix I subspecies and thus banned from commercial trade.

the Federal Republic of Germany has apparently not exercised control over trade with other CITES members of the EEC. Cat skin imports included 530 *F. bengalensis chinensis* from North Korea, where the subspecies does not occur, via the USSR; 2,500 skins and one garment of *F. geoffroyi* from Paraguay and re-exported from Switzerland, three garments of *F. pardalis* and 31 skins from Paraguay and re-exported via Austria and Canada; 12 garments of *F. sylvestris* from India, which did not report the export; 9,000 skins of *F. tigrina* from Paraguay via Japan, as well as 82 re-exported from Austria; and 650 *F. wiedii* skins from Paraguay and re-exported via Austria and Japan; 30 garments of *F. chaus* from India, which not report the export.

Belgium imported 1,000 *F. geoffroyi* skins from Paraguay via Argentina.

Greece is not yet a Party to CITES, but Denmark reported exports to Greece of 360 *Lynx rufa* skins.

**Guatemala**

Guatemala has provisionally suspended, from 24 March 1986, all hunting, capture, local trade, export and re-export of wild fauna while a study is carried out on the country's faunal resources and conservation.

**Uruguay**

In March, 1986, Uruguayan authorities raided shops in Montevideo and seized 2,388 raw skins, 4,093 tanned skins, 47 garments, pieces and accessories and 58 kg of mixed skins. They confiscated those found with false identification stamps. Among the seizures were Geoffroy's cat skins, and an ocelot coat.
OBITUARY

S.P. Shahi (IFS) rtd

It is with deep regret that we record the death of S.P. Shahi, an active member of the Cat, Asian Elephant, and Wolf specialist groups of the Species Survival Commission. Mr Shahi was a member of the Indian Forest Service in his home state of Bihar, and was Chief Conservator when he retired about 10 years ago. Always actively interested in wildlife conservation, he devoted all his energies to the cause after his retirement. Apart from his personal expertise as a forester, he was deeply versed in natural history, both academic and, especially, in the field. Furthermore, having been a government servant he understood the political, administrative and bureaucratic aspects of conservation, which can be of critical importance. All of this made him one of the most valuable workers for nature conservation in India, and this was further enhanced by the respect and affection in which he was held by everyone. Mr Shahi has been nominated to the World Wildlife Fund’s Conservation Roll of Honour.
Dr Paul Joslin, Deputy Chairman of the Cat Group, developed a highly-successful but cheap camera trap during several years spent in Iran with the Department of the Environment. There has been considerable interest in expanding the use of these traps, which are described in the following article.

NIGHT STALKING
Setting a camera 'trapline' for nocturnal carnivores

Feature by Paul Joslin

The leopard felt uneasy. It was hungry, and only a few meters away lay a sizeable piece of meat. For a while, it lay still, tantalized by the smell that permeated the night air, but suspicious of the strange object perched atop a short stick a meter or two beyond it. Eventually, convinced that all was safe, the leopard crept forward and began feeding. There was a sudden flash! Momentarily startled, the leopard resumed feeding, unaware that its image had just been frozen onto celluloid.

This leopard was recorded as part of a general survey by the Iranian Department of Environment, to establish what carnivores inhabited the wild areas of Iran. It was also the subject in test on the latest in a series of design modifications, aimed at developing an inexpensive efficient way of photographing meat eaters at night. The results were most gratifying: leopards, bears, wolves, jackals, hyenas, red fox, sand fox, jungle cats, marten, porcupine, wild boar, vultures, the occasional dog, the odd farmer and one mouse, all documented their presence.

The system depends on the animal being attracted to a bait, and upon tugging at it, triggering the shutter mechanism. Designed to require minimal movement of the bait, the wire lever is sensitive enough that even very small creatures can trip the shutter.

It is the sort of technique which a casual amateur can use involving as little as one camera; or one which a serious investigator can employ, making use of a large number of cameras.

If taking photos is the main objective, this technique has the advantage that most animals will return, quickly learning to come back repeatedly for more bait—and hence, more pictures.

The accompanying diagram shows the general set-up for each camera. Generally, about twenty cameras were used in our 'trap-line'. This would take a complete day to set up, and about three hours of checking on foot each day thereafter, as each camera was a minimum of 300 meters apart.

The mechanical problems have been almost completely overcome with the present system, and the limitations are now due to a combination of low predator numbers in some areas, and the occasional failure of the animal to be attracted to the particular bait used. For small predators, I commonly used pieces of chicken topped with a little fish oil; to attract large predators, it is preferable to use a large chunk of meat, such as a hind quarter of a sheep. If one has access to a complete carcass, so much the better: the smell carries over a large area and the carcass will last much longer.

For our study, large carcasses were rarely obtainable, in addition, they presented considerable difficulty in transporting them to where we wanted to set up our cameras. As a result, for all small carnivores (up to coyote size) we used about a handful of bait per camera. In the dry environment of Iran it was essential to replace the bait about every one or two days, if it was not taken.

We assumed that the small cats were having difficulty in finding the bait by smell. Therefore, beside the bait, we hung a ball of hair or a few feathers at the end of a thread suspended from a stick. A gentle movement of air was enough to make the ball of hair move about, attracting the animal's attention enough to discover the bait.
The cameras used were box cameras which required no settings to be made. Almost all pictures were recorded at night, and therefore required a flash as a light source. The box cameras were of a type that operated a flash cube by the mechanical action of a pin, and did not require any battery. The choice of camera was governed by cost—the cheapest we could find. However, in future, a slightly more expensive camera would be chosen, as the brand we picked did not have consistent shutter speeds.

The camera is housed in a box made of sheet metal, and painted a natural colour such as brown or green, with water-proof paint. The box (1) is open at the front, one side and half the top and back; this facilitates getting the camera in and out, and is as inconspicuous as possible. The floor of the box has a lip to hold the camera securely. A hole is cut at the back to allow access to the film advance wheel.

A number of boxes of a larger size have been made, to shield the camera from rain or direct sun (2). These are open on the side to allow the camera to be easily inserted.

A metal peg is welded to the camera housing (4). The peg is attached to the housing at a slight angle, so as to direct the camera towards the ground, about two meters distant when the peg is vertical.

This peg is inserted into a strong plastic tube (5), which is approximately 50 cm. long. This tube fits over the end of a 25 cm. long metal rod which has been driven or dug into the ground (6).

Another rod, approximately 20 cm. in length, is secured in the ground (7) beside the bait. This rod differs in having a hole through it, as illustrated.

A 12 kg. test nylon string extends from the end of the wire lever, through the eye of a ring attached to the plastic tube, through the eye of the smaller rod and attaches to a ring. The ring (8) is larger than the eye of the rod, so as to be impossible to pass through.

Between the ring and the bait is tied a single strand of 5 kg. test nylon string. Its function is to break before anything else does when a carnivore pulls on the bait.

If large bait is used, it is secured to a tree with a strong rope, to ensure that it is not dragged away.

Depending on the purpose of the photographs, it may be useful to include the date and other pertinent information in the photograph. This can be done by writing the essential information on a small board near the bait within the camera's field of view. For this, we used boards 20 X 4 cm., and a coarse marking pen to make large bold characters in code form; for example a label might read B12JUN30, which indicates survey (B=Beaver Lake), which camera (12=camer number) and date (JUN30=June 30).

The surprise element makes photographing animals this way a lot of fun—especially in the dark room when it suddenly becomes clear what it was that carried off the bait.
Additional Notes on Cameras

There are essentially three types of low-cost camera available. The first has no battery, the flash is triggered mechanically and the film is advanced by hand. The disadvantage is that there is only one photo at a time, but the camera can be left out indefinitely waiting for that one shot.

The second type has automatic film wind, and uses batteries to operate both the flash and the winder. They can be set to trigger several photos, but the batteries last only a day and a half when the flash is left in a constant state of readiness.

The third type of camera is the Polaroid. In addition to instant development, it also automatically advances the film and can operate for weeks with the flash and advancing mechanism in a constant state of readiness. The disadvantage is that it works poorly in very low temperatures, or when 100% humidity is combined with high temperatures. Several trip lines to bait or across the game trail have to be set for a series of photos.

Since the attached article was written the box which houses the camera has been replaced with a small tube attached to the camera face, to which is attached the lever mechanism.

Because of the low cost of the cameras several can be used on a trapline, thus making it possible to document the presence or absence of a number of types of carnivore in a reasonably-sized area within a comparatively short period. In some situations it is also possible to get some reasonable indicator of density. For example, there had been only a dozen records of Ruppell's fox in Iran, but over 100 photos were obtained in the Kavir desert. It was possible to say that there were probably three times as many foxes, based on the number of photos, as compared with the western portion of the Kavir, while further west red fox appeared at baits, but no Ruppell's fox were photographed. This suggested that the two species might not be present in the same regions.
Gir Lion Census-1985

The Gir forest in Gujarat State is unique as the only remaining home of the Asian lion. It may be difficult to imagine that the Asiatic Lion once ranged from Greece to Bihar. The destruction of its habitat and hunting was the beginning of the end of Asiatic lion from one country after another. The Asiatic Lion ultimately found its last abode in Gir forest of Gujarat State. Gir is the largest biological, intact, continuous tract of land reserved primarily for the conservation of the indigenous fauna. The total area of the forest is 1412 sq.km out of which 258 sq. km have been declared as national park and the remaining area is declared as sanctuary. The era of protection to the Asiatic Lion came in 1900 when its population had dropped to only 100. However, the actual protection started with the active interest taken by the Government of Gujarat in declaring the area as a Sanctuary in 1962, which followed by various development activities undertaken for the rehabilitation of the flora and fauna in the area. By 1972 the tempo of development was at a peak when the Government of Gujarat decided to launch a special programme for resettlement of the Malihars residing in the Gir area. A census of the permanent Malihars residing within the area was carried out, cattle maintained by them were enumerated and a detailed scheme was worked out which was put into operation by 1974. There were more than 850 Malihar families with 50,000 cattle. Out of these, 547 Malihar families have already been shifted by giving them land for cultivation, houses and other facilities like education, medical etc. outside the sanctuary. Simultaneously, the Government of Gujarat declared the entire Gir forest as closed to grazing from outside cattle. Facilities for drinking water for the wildlife in the sanctuary were created, commercial harvesting of the forest was totally stopped and the staff in the area was strengthened to protect wildlife against outside forces. The facilities for the visitors were also improved and a network of roads was laid down.

All these activities undertaken by the Government and the dedication of the staff started paying dividends. The stoppage of grazing and the removal of cattle from the forest area not only improved the overall health of the grass but also made it available for the herbivore animals. While the health and strength of the herbivore animals improved, the Asiatic Lion also grew and thrived well in turn. It is very difficult to judge the impact of any development activities undertaken with reference to wildlife, except through the increase in the population or the natural death rate. The census of the Asiatic Lion has been carried out since last 30 years. Initially the censuses were carried out either on the basis of information gathered from the local people and the forest officials stationed in the area on the basis of pugmarks etc. No visual count was undertaken in the earlier censuses. It was felt that in order to arrive at a definite trend in the population of the lions it was necessary to establish a standard practice for the censuses. For the first time in 1968 the census was carried out on live basis and by visual count. Subsequently, with a view to carry out the census of other animals also and to have a double check on the lion censuses, a method was evolved to enumerate the animals first on water holes and then on the live basis. This method proved quite successful and has given sufficiently accurate data regarding wildlife in Gir forest. The census in May 1985 was also carried out on the same lines. The methodology is described in brief as follows:

CENSUS ON WATER HOLES

Normally the period of census is fixed in April of May so that the number of water holes is reduced to the minimum. In the current census 487 water holes were identified and on each water hole either a machan was constructed at a proper position or a hut was constructed on the ground for the enumerators. On each water hole three persons were posted to keep a vigil of the visit of animals around the clock for 24 hours. All the animals visiting these water holes were timed and listed individually. It was expected that any information gathered from the local people and the forest officials stationed in the area on the basis of pugmarks etc. No visual count was undertaken in the earlier censuses. It was felt that in order to arrive at a definite trend in the population of the lions it was necessary to establish a standard practice for the censuses. For the first time in 1968 the census was carried out on live basis and by visual count. Subsequently, with a view to carry out the census of other animals also and to have a double check on the lion censuses, a method was evolved to enumerate the animals first on water holes and then on the live basis. This method proved quite successful and has given sufficiently accurate data regarding wildlife in Gir forest. The census in May 1985 was also carried out on the same lines. The methodology is described in brief as follows:

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1. Lions:
   - Male: 66
   - Female: 71
   - Sub-adult: 239
   - Cub: 48
2. Panthers: 201
3. Chital: 10,466
4. Sambar: 772
5. Nilgai: 2,081
6. Wild boar: 2,212
7. Fourhorneed Antelope: 1,063
8. Chinkara: 311
9. Monkeys: 6,912
10. Hyenas: 192
11. Others: wild cat, fox, pangolin, mongoose, etc. 1,548

While we are looking at the final census figures available before us, it is time to analyse some of the basic data before us:

1. There has been a steady increase in the population between 1974 and 1985 at the rate of 2.5% or more annually. This is a very healthy sign.
2. The ratio of the males and females has been maintained and indicates a healthy ratio for the population rise.
3. The number of juveniles and cubs is more when compared to the previous census which clearly indicates the acceptance of the various activities undertaken by the Department for the preservation and protection of wildlife.
4. The population of the herbivores has marginally increased which in the context of the shifting of the Malihars and their cattle and the improvement of fodder is satisfactory.

While we are discussing various aspects of the Gir forest, it will be worthwhile to mention that it will be a mistake to visit the Gir forest for viewing of lions only. There are many other wild animals like chital, sambar, fourhorneed antelope, nilgai, chinkara, etc. which give a thrill to the lovers of wildlife. Additionally, these animals, Gir forest offer a wide range of birdlife in which more than 250 species have been identified. The Sanctuary has a freshwater crocodile breeding farm and reservoirs which add to the attraction to this area.

The Forest Department had been arranging for the lion show for the benefit of tourists for a limited duration, but the viewing of the lions or the lion show will be coming to an end very soon with the opening of a Wildlife Park. The park covers an area of 400 ha. and is fully fenced. The visitor will be taken round within the park in vehicles, where they can view the Asiatic Lion in the natural surrounding. This park will afford good opportunities to study and research on various aspects of the life cycle of the Asiatic Lion.

B.P. Lakhani
Chief Conservator of Forests
Vadodara, Gujarat.
SNOW LEOPARD SIGHTED

The following message was reported from the U.S. Embassy in New Delhi and was sent to the Fish & Wildlife Service, Office of International Affairs, in Washington, D.C.:

In a letter received from the embassy on March 24, Dr. Joseph Fox, field director of the subject project, in a report from Markha Valley, Jammu and Kashmir, has reported snow leopard observation for approximately twenty daylight hours during March 7-9, 1986. The snow leopard sighted was an adult female. The project personnel were able to view the animal and take photographs.

The subject project initiated field work in early November 1985. Dr. Fox and three Indian research fellows, Mr. Satya Priya Sinha, Mr. R.S. Chundawat, and Mr. Pallav Kumar Das, were accompanied to the initial field site by Mr. H.S. Panwar, Director of the Wildlife Institute of India, and Mr. Alok Chandola, coordinator of logistics for the project. Three wildlife officers from the Jammu and Kashmir Department of Wildlife Protection joined the research crew for the first stage of surveys.

The first phase of the survey was completed on January 24, 1986. After a three-week break, the team returned to Leh in the second week of February. Dr. Fox, along with other team members, will arrive at New Delhi on April 1, 1986, when the final phase of the survey will begin in the states of Uttar Pradesh and Himachal Pradesh. The survey activities in these two states are expected to be completed on July 24, 1986.

The ongoing field survey is a demanding project not just because the snow leopard is so elusive an animal, but because of the special characteristics of the mountain habitat it occupies: the rugged mountainous terrain; the rarified, high-altitude environment at elevations of 15,000 to 19,000 feet; the extreme and unpredictable climatic conditions of the Himalayan winter; the danger from falling rocks and avalanches; and the remoteness from human habitation.

The embassy is pleased with the progress of the project and requests the forwarding of the information on the sighting to Helen Freeman, president of the International Snow Leopard Trust.

INDO-U.S. SNOW LEOPARD PROJECT
by Joseph L. Fox

Progress report on field work as of December 30, 1985

The supplies and equipment arrived in Srinagar on November 7, and were repacked in another truck, and by about 4 p.m. the truck and we, in two jeeps, were on our way to Kargil over the 11,500' Zoji La that we had so feared to be closed by snow. We crossed the pass in the dark, with no snow present, and arrived in Kargil (9,200') at about 10 p.m. The next day it again took until midafternoon to engage and load a truck with our gear for our final stage of the journey. We left Kargil at about 3 p.m. and headed up the Suru Valley to discover our basecamp.

The following day revealed a beautiful, expansive, albeit stark, alpine valley. Its floor was strikingly flat, close to a mile wide, surrounded by towering ridges, convoluted rock, and dominated to the west by massive twin peaks of Nan and Kun (23,000' +). Following a light snowfall, briefly threatening prospects of motor transport, and presaged things to come, Mr. Panwar returned with Mr. Chandola to Kargil. Mr. Panwar continued south, while Mr. Chandola remained to obtain additional supplies and equipment in Kargil.

In our rush to get over the passes before they closed, we flaunted the human physiological reactions to high altitude and paid the price in acclimatization over the next week or so. However, all survived well and we gradually began to take stock of our surroundings. The rest house (our basecamp) is a collection of several airy stone buildings situated in the small Buddhist village of Zulidok at the elevation of 13,000'. This village demarks a change in human culture, for the people living down-valley are Muslim. Several miles up-valley a Buddhist temple punctuates the bare landscape.

On November 14-15, following Mr. Chandola's return from Kargil and additional supplies, we made a reconnaissance trip over Pensi La into central Zanskar, as far as the main town of Padam. We decided to remain on the west side of Pensi La until late December (after Ladakhi New Year). We would then proceed to the proposed Hemis National Park in the Markha Valley southeast of Leh. From initial reports we
have received, snow leopard presence and problems with livestock predation appear more prevalent in Markha Valley than our current location. Thus, a comparison of areas is appropriate, in order to discuss whether these reports reflect greater snow leopard density, greater human density, or greater wildlife department efforts in gathering information on the snow leopard.

By late November we had become faintly familiar with the area immediately surrounding Zulidok. Ibex, very difficult to spot among the rocky mountainsides, soon began to be found in many areas. There appear to be about 100 ibex within a 10 km radius of Zulidok. Patches of grassland up some of the side valleys were well developed and not too heavily grazed, providing good feeding area for the ibex. Himalayan brown bear sign was common in the area and although no sightings were made this was probably due to them having gone into hibernation. Fox sign was ubiquitous, and their scats indicated they were feeding on the pikas and meadow voles which were also abundant.

On November 23, the day after a very light snowfall, Mr. Singh was examining some plant communities a few miles from camp, when he discovered some day-old tracks of a snow leopard. We tracked the animal (thought to be a female by Mr. Singh, based on track configuration) from its traverse of the ridge above camp at about 15,000' down to where it crossed a creek north of Zulidok at about 13,200' and back up the ridge on the other side. Within the next two weeks we found further old and relatively recent tracks in another side valley that were from about the same date as the original find. However, in this case it appeared that two animals had traveled together some distance. There were several old and one recent snow leopard scrapes in this side valley. The amount of sign we encountered in our 42-day stay suggests the preserve of one or two resident snow leopards, but is not indication of intensive use in the area.

On December 15 the long-awaited snows arrived with a vengeance. No further sign of snow leopard was seen until our departure for Kargil, when tracks were found traversing the lower main valley slopes a few miles below Zulidok. We arrived in Kargil on Christmas Day.

We set off for Leh on December 28, and will leave Leh in two groups on December 30 to survey the Markha Valley from opposite directions (involving the crossing of 16,000' and 18,000' passes). About two and a half weeks hence, we will return to Leh and Delhi for a midwinter break before resuming the surveys in Ladakh in early February.
WILDLIFE CONSERVATION AND THE SNOW LEOPARD IN PAKISTAN

An interview with Mumtaz Malik, Conservator of Wildlife, North West Frontier Province of Pakistan (presently studying at University of Montana)

QUESTION: Where is the snow leopard currently found in Pakistan?

ANSWER: In the districts of Chitral, Swat, Dir, Indus, Kohistan, and in Gilgit, where it is found all the way to China. It is endangered throughout this range but the largest populations are probably in Chitral and the Northern Areas.

QUESTION: What are the major prey species?

ANSWER: The major prey species in most of this range are the ibex, markhor, snowcock, and marmot but further north in Gilgit you would also find blue sheep.

QUESTION: Does the snow leopard prey heavily on domestic stock?

ANSWER: It does not seem to be a major problem currently as we only receive occasional reports, two or three a year at the district headquarters. But we do not hear of all the incidents and with livestock increasing in these areas, the government is recognizing the concern. There is a proposal before the government which would compensate the people according to the market price of the stock, or if the loss is more complicated, a price decided by a committee. This committee would include the man whose livestock has been killed, the wildlife officer who has inspected the actual carcass, a member of the union council of that village, and one other qualified individual. They will decide the appropriate compensation. It is a lengthy process but will ensure that the farmer is heard and proper deliberations are taken before compensation is made. The decision will be relayed to the Conservator of Wildlife in Peshawar and the money given directly then to the farmer by an official.

I would like to suggest that here is where there is a role for non-governmental agencies: to help raise funds for such direct compensation. Within the basic structure of wildlife agencies it is difficult to raise extra funding for this type of program because there is still a critical need for wildlife salaries and support materials. The way to involve non-governmental agencies in such a program is being discussed.

QUESTION: Could you give us some background on projects in parks management in the North West Frontier?

ANSWER: The North West Frontier Province has two national parks: the Chitral Gol, which is approximately 20,000 acres, and Ayubia Park, of about 2,000 acres. Ayubia National Park has been created to save the conifer and oak forests, as well as a sanctuary for the common leopard, Rhesus monkey, flying fox, koklass pheasant, and kaleej pheasant.

Since Chitral Gol was declared a national park in 1984 we have been working on the elimination of grazing of goats and cattle within the park. In order to more effectively implement this policy and gain the support of the local people, the government has granted some concessions. One, the timber quota for people of villages adjoining Chitral Gol has been doubled. This timber is harvested from forests outside Chitral Gol, managed by forestry personnel, and then sold at an open auction. Sales proceed minus labor expenditures then go directly to the people living in the vicinity of the national park for projects such as school programs, irrigation channels, and health care. This is in addition to the regular budgets these villages receive from the government so they can see and experience a direct benefit from the conservation of land for wildlife purposes. Also, and this is quite new, job preferences in wildlife projects in the area are given to the people of those villages.

The control of goat grazing is now doing much better but we still have a problem with cattle grazing because there are so few alternative high alpine grazing pastures available. A big help here would be for each village to have a tractor, reducing the number of oxen needed for plowing the fields and thus putting less pressure on grazing areas.

All these programs have direct benefits for snow leopards. For instance, the domestic stock compete with markhor, a principal prey species, for winter grazing habitat.

When I left Pakistan last fall (to enter the University of Montana) we were in the final steps of purchasing the last private property still in Chitral Gol. This was a significant purchase, in terms of money and also by removing the last private grazing herds—a very tangible step by
the government for wildlife purposes, illustrating a commitment for the long term.

Another aspect of wildlife management that we are exploring is the allowance of two permits per year in the Chitral Gol for the hunting of markhor. This would be of minimum impact on the herd as there are 600-700 markhor in Chitral Gol and the actual hunt would be tightly controlled. The two permits would be expensive, possibly $20,000 each, and the money would go directly back to the area for necessary projects in the villages, again illustrating to the people whose support is vital that having healthy wildlife populations can be an improvement in their own lives.

**DONATION**

We recently received the following letter:

Dear Sir:
The enclosed check is a memorial for a Mr. Eric Spitz. He had a love for animals and especially for the snow leopard.

Very truly yours,
Don Manion
Como Zoo Docent Association
Saint Paul, Minnesota

ISLT greatly appreciates the Como Zoo docents' generosity. We encourage members to consider making this thoughtful remembrance to the memory of others.

**WHERE IN THE WORLD?**

Here are the approximate sites of some of the programs mentioned in this issue.
The stuffed enigma

The report in The Daily Telegraph on 15 December, 1984, of a "new strain" of wildcat Felis silvestris may well be premature, but the fact remains that a very strange cat of some kind has emerged from the taxidermist's and is continuing to evade definite identification.

Described as "dog-sized but not a dog" by Tomas Christie, the Scottish gamekeeper who claims to have caught it, the animal is 107cm from nose to tail, weighs 6.3kg and has tusk-like canines, a squat head and shiny black fur flecked with spiky white hairs. Christie adds that it has a cat's features but is "definitely not a wildcat".

He says he captured it in the summer of 1983 at the Kellas House estate in Dallas, Grampian, and that it was one of a pair he saw crossing the River Lossie. He kept the news to himself until the following spring, when another gamekeeper, Ronnie Douglas of Revack Lodge, near Grantown, reported snaring an almost identical animal.

Douglas preserved his catch in a freezer, but its present whereabouts is unknown.

One of the creature's most enthusiastic publicists is Di Francis, the Torquay-based author of Cat Country, which develops the dubious theory that Britain harbours a population of large cats that have managed to elude both zoologists and hunters.

She has pronounced the Kellas cat an "entirely new" race of F. silvestris, not to be confused with the puma-sized beasts that she has been writing about, but "a bonus, something we've discovered on the trail of the big cat".

Dr Frank Turk, a retired reader in zoology at the University of Exeter, says that he has examined the stuffed specimen and is satisfied that it is a mutant melanistic wildcat. He says that, though the cat is "very much larger than most modern wildcats", it shares the broad cranium and thick bushy tail, passes a hair analysis and shows a wildcat-like tooth pattern—as far as can be determined from the taxidermist's work.

He also refers to "persistent characters of the wildcat reported by Conrad Gesner in the sixteenth century" and the black wildcat named Felis daemon in 1904 by the Russian Professor Satunin, who found such an animal living among ordinary wildcats in South Caucasus.

Three decades later, another Russian zoologist rejected Satunin's conclusions, as he felt the specimen was indistinguishable from a domestic cat. (No melanistic wildcat has ever been recorded in Britain.)

Nevertheless, it is difficult to rule out a 'mesaissance' between a wildcat and a feral domestic cat or any of several other explanations, and most zoologists remain sceptical.

Specialists from the British Museum and the Nature Conservancy Council say that the characteristics put forward by Dr Turk are far from conclusive, that, for example, the white patches on the chest and thighs may indicate nothing more than wildcat 'blood' and that a badly stuffed specimen is not a good enough basis for any kind of verdict.

MICHAEL GOSS

Moggie or mutant? Gamekeeper Tomas Christie contemplates the Kellas cat.
The Curse of the Many Cat Mummies

By Jane Friedman

SAQQARA, Egypt — Sixty feet below the ground, in the dark depths of ancient tombs, a 39-year-old French archaeologist is searching for information about the prime minister of one of the great pharaohs. But instead, six years after he began his dig in the shadow of the oldest pyramid, Alain Zivie is still coming across hundreds of cat mummies, a discovery that is now beginning to bug him.

“I’m involved in a fortuitous encounter of things that have nothing to do with each other,” said Zivie, a Parisian who has spent the last few years digging at Saqqara and plans to spend the coming years that way too. He was talking about the strange coexistence of the burial chambers of Aper-El, thought to be the prime minister of the Pharaoh Akhenaten, and a huge necropolis of cats, all wrapped in gauze.

“People say cats, cats, cats,” said Zivie, referring to the current popularity of the feline and the lack of interest in Akhenaten’s vizier. “I’ve become l’homme des chats.”

Zivie’s dig, financed by the French foreign ministry and France’s national research center, the CNRS, illustrates the pitfalls involved in digging for ancient artifacts in Egypt. Many tombs were pillared in antiquity and later re-used. The tomb of Aper-El was built during the 18th dynasty, during the pivotal reign of Akhenaten, who installed a kind of monotheism 3,500 years ago.

Aper-El is intriguing because of his unusual name, which indicates that he might have come from an area northeast of Egypt, like the Hebrew Joseph, who became a royal adviser.

Aper-El’s tomb, robbed in antiquity, was used in the Greek period (330 to 30 B.C.) as a burial ground for cats because of its proximity to a temple of the cat goddess Bastet, who was said to protect the human heart.

Zivie, explaining the rise to pre-eminence of gods in the image of animals such as cats, cows and bulls, and the consequent mummification of those animals, said: “Things weren’t going so well for Egypt, and the gods were very distant. Animals became the intermediaries for the gods.”

When Zivie began his dig in 1980, led by remnants of hieroglyphs that identified this as the entrance to Aper-El’s tomb, he came across a pile of rubble at the entrance, a kind of archaeological potpourri of fragments from Aper-El’s epoch and from the mummification of cats much later. Afterward, excavating the tomb, he discovered a connecting group of rooms containing hundreds of cat mummies.

Zivie has now descended 60 feet (18 meters), through dark shafts, down rope ladders sometimes lighted by a single bulb, to clean out six rooms belonging to Aper-El and his family. The work has been painstaking and slow. The tomb, dug out of the limestone hill, is crumbling. Fires during antiquity contributed to the ruin. A rest house built willy-nilly over the site in the 1940s has not improved the situation. The French company that is building the Cairo Metro bailed out Zivie by offering scaffolding to support the walls and make excavation safer.

Despite his efforts, Zivie has learned little about the mysterious Aper-El. This year the team found bits of wooden coffins that, when assembled, might yield clues about Aper-El’s family. Last year and the year before, Zivie found painted wooden coffin lids and, in a spectacular discovery, a perfectly intact painted head of a markedly Asiatic-looking woman with huge earrings.

The cat mummies continue innumerably.

“I knew I would find cats,” Zivie said, “but not in this number.” In one subterranean room of an adjacent tomb, 300 are piled on the floor. Some are no longer in their wrappings. About five other rooms contain more cats.

At the entrance to the tomb complex, Zivie has assembled an exhibit from his find that includes skulls of wild cats, an entire yellow striped domestic cat with its coat intact, and a kitten’s wooden sarcophagus. Zivie says some of the cats died of natural causes while others apparently were killed. If, as he believes, the cat mummies were a kind of offering to the cat goddess, then perhaps some were killed to add to the supply.

Information about the cats, too, is scarce. There are no wall inscriptions about them. A zoologist from Paris is recording their brain and bone sizes to determine their types, but that is all.

As Zivie packs up, catalogs the season’s finds and closes the tomb, preparing to return in October to continue his search for Aper-El, he is resigned to the fact that next year again he will have to deal with cats.

On the door of his closet in the bare room he occupies next to the tomb, he has glued a cartoon of Garfield the cat. The caption is, “Take a cat to lunch.”

Jane Friedman is a journalist based in Cairo.
Alwis, Mr Lyn de, 30 Hotel Road, Mount Lavinia, SRI LANKA. Tel: (0094-1). SAs. Leopards, fishing cat, rusty-spotted cat.

Artois, Mr. Marc, Charge de Recherches, Centre National d'Etude sur la Rage, Ministère de L'Agriculture, Domaine de Pixérecourt, B. P. No. 9, 54220 Malzéville, FRANCE. Tel: (0033) 16 (8) 329 26 08. Eur. Wildcat.

Baudy, Mr Robert E. President, The Rare Feline Breeding Center, P. O. Box 100, Center Hill, Florida 33514, UNITED STATES. Tel: (001) (904) 793 2109. WAF SAm SEAs WEur. Clouded leopard, marbled cat, tiger, leopard. Captive breeding.

Belden, Dr. Robert, Florida Panther Recovery, Florida Game, Wildlife, and Fish Commission, Wildlife Research Project Office, 4005 South Main Street, Gainesville, Florida 32601, UNITED STATES. Tel: (001) (904) 376 6481. NAm. Florida panther.

Bertram, Dr. Brian, Curator of Mammals, Zoological Society of London, Regent's Park, London, United Kingdom. Tel: (00 44) (01) 722 3333. EAf. Lion, leopard, cheetah. Captive breeding.

Biswas, Dr Biswanoy, Emeritus Scientist, Zoological Survey of India, Indian Museum, 27 J. L. Nehru Road, Calcutta-700 016, INDIA. Tel: (0091) 33 23 2562. SAs. South Asian felids.

Blomqvist, Dr. Leif, Assistant Director, Helsinki Zoo, 00570 Helsinki 57, FINLAND. Tel: (0035) (90) 170 077. CAs. Snow leopard (studbook keeper).

Bootha, Professor J. du P., Department of Zoology, University of Pretoria, Pretoria 0002, SOUTH AFRICA. Tel: 420 2627. Tlx 30160 SA. Gram: PUNIV.

Breitenmoser, Dr. Urs, Spillgerten B, 3770 Zweisimmen, SWITZERLAND. Tel: (030) 2 36 49. EUR. Lynx.

Brockelman, Dr Warren Y., Dept of Biology, Faculty of Science, Mahidol University, Rama VI Road, Bangkok 4, THAILAND. SEAs. SEAs felids. Trade

Crawshaw, Mr. Peter G., 118 Newins Ziegler Hall, Univ. of Florida, Gainesville, Fl 32611, UNITED STATES. SAm. Jaguar, ocelot, margay.

Delibes, Dr. Miguel, Estación Biológica de Doñana, Pabellón del Perú, Avenida de María Luisa s/n, 41013 Seville, SPAIN. Tel: (0034) (954) 23240. WEur.

Iberian lynx. Captive breeding.

Eisenberg, Dr John F., Dept of Natural Sciences, The Florida State Museum, University of Florida, Gainesville, Florida 32611, UNITED STATES. Tel: (001) (904) 392 1721. NAm SAm. Jaguar, puma.

Foote, Dr. Tom, AAZPA Conservation Coordinator, ISIS Office, Minnesota Zoological Garden, Apple Valley, MN 55124, USA. Tel: (001) (304) 242 2160. Captive breeding.

Frame, Dr. George, c/o IUCN, World Conservation Centre, 1196 Gland, SWITZERLAND. Lion, leopard, cheetah.

Freeman, Ms. Helen, President, International Snow leopard Trust, 16463 Southeast Thirtyfifth St., Bellevue, Washington 98008, UNITED STATES.

Garzón, Mr. Jesús, Saltos de Torrejón, Plasencia (Caceres), SPAIN.

Geertsema, Ms. Aadje, Pramgracht 3, 3761 LA Soesdijk, NETHERLANDS. Tel: (02155) 12698. EAF. Serval.

Hamilton, Dr. Patrick, Wildlife Conservation and Management HQ, P. O. Box 40241, Nairobi, KENYA. EAF. Cheetah, leopard, lion.

Hemmer, Prof. Dr. Helmut, Anemonenweg 18, D-6500 Mainz-Ebersheim, FED. REPUBLIC OF GERMANY. Tel: (0049) 42424. (Institut für Zoologie, Johannes Gutenberg Universität, Saarstrasse 21, D-6500 Mainz, FED. REPUBLIC OF GERMANY. Tel: (0049) 06136). NAF SAs. Pantherine cats (Barbary lion), sand cat. Captive breeding.

Hornocker, Dr. Maurice, Unit Leader, Idaho Cooperative Wildlife Research Unit, University of Idaho, Moscow, Idaho 83843, UNITED STATES. Tel: (001) (208) 855 7975. NAm SAm. American felids.
Jackson, Mr. Peter, Haut Verger, 1171 Bougy-Villars, SWITZERLAND. Tel: (0041) (021) 76 60 12. SAs Tiger, Asiatic lion.

Jackson, Mr Rodney, California Institute of Environmental Studies, 340 Funston Avenue, San Francisco CA 94118, USA. Tel: (001) (415) 668 9271, Res: (415) 381 9223. SAs Snow leopard.

Joslin, Dr Paul, Assistant Director, Chicago Zoological Park, Brookfield, Illinois 60513, USA. Tel: (001) (312) 485 0263. SAs SWAs. Asiatic lion, cheetah, Caspian tiger.

Karanth, K. Ulass, Centre for Wildlife Studies, 499 Kuvempu Nagar, Mysore 570 023, INDIA. Tel: (30364). SAs, tiger, leopard.

Khan, Mr Mohd Khan bin Momin, Director General, Wildlife and National Parks, Peninsular Malaysia, Block 19 Jalan Duta, Kuala Lumpur, MALAYSIA. Tel: (0060) 3 941466/941110. SEAs. SEAs felids.

Khan, Dr M. A. Reza, Curator, Birds, Al-Ain Zoo & Aquarium, P. O. Box No. 1204 AL AIN, Abu Dhabi, United Arab Emirates. Tel: (0097) 12 828 488/res. 828 4540. Tlx: 34008 baldia em. c/o M. A. Kalam, 1st Floor, Dhanashi, House 25, Road no. 1 Dhaka 5, BANGLADESH. Tel: 507019. SAs SWAs. SAs and SWAs felids.

Lewis, Mr John, Minnesota Zool. Garden, 12101 Johnny Cake Ridge Road, Apple Valley, Minnesota 55124, USA. Tel: (001) (612) 432 9010. EAs SEAs. Clouded leopard (Studbook keeper).

Leyhausen, Prof. Dr Paul, Auf'm Driesch, D-5227 Windeck 1/Halscheid, FEDERAL REPUBLIC OF GERMANY. Tel: (0049) (02292) 1641. EAs EAs SEAs. Cat, Xenophobus.

Lu Houji, Dr, Department of Biology, Animal Ecology Research Group, East China Normal University, Shanghai 200062, CHINA. EAs. Chinese tiger, leopard.

MacDougall, Dr Charles, Tiger Tops, P. O. Box 242, Kathmandu, NEPAL. Tel: (0097) 7 2 12706, Tlx: (0748) 2216 tigtop. SAs. Tiger, leopard.


Maruska, Mr Ed., Executive Director, Cincinnati Zoo, 3400 Vine Street, Cincinnati, Ohio 45220, USA. Tel: (001) (513) 281 4701. Captive breeding. Tropical felids. Trade.

Melquist, Dr Wayne E., Idaho Dept of Fish and Game, 600 S. Walnut, P. O. Box 25, Boise, Idaho 83707, USA. Tel: (001) (208) 886 6434. SAm. SAm felids.

Mendelssohn, Prof. Heinrich, Chair of Wildlife Research, Dept of Zoology, University of Tel Aviv, Faculty of Life Sciences, P. O. Box 39040, Ramat Aviv 69978, Tel Aviv, ISRAEL. Tel: (0097) 23(03) 420812. SWAs. Leopard, jungle cat, caracal, wildcat, sand cat.

Miller, Dr S. Douglas, Vice President, Wildlife Research and Program Development, National Wildlife Federation, 1412 Sixteenth Street, N. W., Washington, D. C. 20036, USA. Tel: (001) (202) 797 6800. NAm SAm. Bobcat, lynx, puma, ocelot.

Mishra, Dr Hemanta R., National Parks Building, Babar Mahal, P. O. Box 3712, Kathmandu, NEPAL. Tel: (0097) 215850/215912. Tlx NP2203. SAs Tiger, leopard.

Navarro L., Mr Daniel, Centro Investigaciones, Apartado postal 886, Cancun Q. R. os, Quintana Roo, MEXICO. SAm. Ocelot.

Norton, Mr Peter M., Dept of Nature and Environmental Conservation, Research Section, Private Bag 5014, Stellenbosch 7600, REP. SOUTH AFRICA. Tel: (0027) (02231) 70130. SAm. Leopard.

O'Brien, Dr Stephen J., Section of Genetics, Laboratory of Viral Carcinogenesis, National Cancer Research Institute, Bldg. 560, Room 11-85, Frederick MD 21701, UNITED STATES. Felid evolution and genetics.
Owens, Drs Mark and Delia, c/o Frankfurt Zoological Society, Alfred Brehm Platz 16, 6000 Frankfurt a/M, FEDERAL REPUBLIC OF GERMANY. EqAf SAs.
Kalahari Lion, leopard, cheetah.
Panwar, Dr Hemendra S., Director, Wildlife Institute of India, P. O. NewForest, Dehra Dun 248 006, INDIA. Tel: (0991) 27727. Tlx: (081) 595238 pres in. As. Tiger, leopard.
Quigley, Mr Howard, Wildlife Research Institute, P. O. 3246, University Stn, Moscow, Idaho 83843, UNITED STATES. T: (208) 885 6871. 12131 Skyline Blvd, Oakland, CA 94619, USA. Tel: (415) 531 5623. Sam. Jaguar, puma, ocelot, jaguarundi, pampas cat.
Rabinowitz, Dr Alan, Animal Research and Conservation Center, New York Zoological Society, Bronx Zoo, Bronx NY 10460, USA. Tel: 01(212)220 5155. Tlx: (023) 428 279 NYZARC. Cam. Jaguar.
Rajjitsinh, Dr M. K., Secretary (Wildlife), Department of the Environment, Krishi Bhavan, New Delhi 110 011, INDIA. Tel: (0991) 11 388071/38461, res 615860, Tlx: (081) 315265 doe in. SAS SEAs. Tiger, leopard, Asian felids.
Rashid, Mr M. A., Ketan Appartments, Flat 103, Fatehganj Camp, Baroda 390 002, INDIA. Tel: (0991) ( ) 58190. SAs. Asiatic lion, cheetah, leopard. Captive breeding.
Rau, Mr Jaime R., Estacion Biologica de Doñana, Apartado Postal 1056, Seville 41013, SPAIN. Sam.
Roberts, Mr Tom, "Cae Gors", Rhoscanfnhir, near Pentraeth, Anglesey LL75 8YU, UNITED KINGDOM. P. O. Box 3311, Malir City Post Office, Karachi 23, PAKISTAN. SAs. Pakistan felids.
Sankhala, Mr K.S., 21 Duleshwar Garden, Jaipur 302001, INDIA. Tel: (0991) ( ) 61958. SAs Tiger, leopard, Indian felids.
Santiapillai, Dr Charles, WWF Indonesia Project, P.O. Box 133, Bogor, INDONESIA. SAs SEAs. Leopard.
Seal, Dr Ulysses S., Veterans Administration Hospital, 54th Street & 48th Avenue South, Minneapolis, Minnesota 55417, USA. Tel: (001) (612) 725 6767 extn 6021, res. (612) 888 7267. Captive breeding. Tiger.
Seifert, Prof. Dr Siegfried, 7010 Leipzig, Dr Kurt Fischer Strasse 29, Zoologische Garten, DDR. Tel: (037) 41 281235/52971. Captive breeding. Tiger (Studbook keeper).
Singh, Mr Arjan, Tiger Haven, P.O. Mall, 262 902, Kheri District, UttarPradesh, INDIA. SAs. Tiger, leopard, Indian felids.
Singh, Mr Ram Lakhan, Director, Project Tiger, Bikaner House, New Delhi 110 011, INDIA. Tel: (0991) 11 384428; Tlx (081) 314497. SAs. Tiger.
Smith, Dr James L. David, Dept of Fisheries & Wildlife, University of Minnesota, 200 Hodson Hall, 1980 Folwell Ave, St Paul, Minnesota 55108, USA. Tel: (001) (612) 373 9904/3026 (Francine Cuthbert 373 9738; Dept 373 3028); Res: 6992837. SAs Tiger, leopard.
Smith III, Mr Guy L., Knoxville Zoological Garden, Knoxville, Tenn., USA. Tel: (001) (615) 637 5331. Captive breeding. Asiatic lion (Studbook keeper).
Stuart, Mr Chris, P.O. Box 12, Elim Hospital, 0960 SOUTH AFRICA. Tel: (01552) 611 extn 49
Sumardja, Drs Effendy, Directorate of National Parks and Recreational Forests, 100 Jl. Ir. H. Juando, Bogor 16123, INDONESIA.
Sungquist, Dr Melvin E., Dept of Natural Sciences, Florida State Museum, University of Florida, Gainesville, Florida 32611, USA. Tel: (001) (904) 392 1721. SAM SAs. Tiger, leopard, ocelot, jaguarundi.

Suwanakorn, Mr Phairut, Deputy Director General, Royal Forest Department, Phaholyothin Road, Bangkok, Bangkok 10900, THAILAND. SEAs. Thai felids.

Tan Bangjie, Professor, Beijing Zoo, Beijing, CHINA. EAs. Chinese felids.

Tilson, Dr Ronald L., Curator of Research, Minnesota Zoological Garden, 12101 Johnny Cake Ridge Road, Apple Valley, Minn 55124

Visser, Mr John, P.O. Box 20, Camps Bay 8040, SOUTH AFRICA

Walker, Mr Clive, Lapalala Wilderness School, P.O. Box 645, Bedfordview 2008, SOUTH AFRICA. Tel: (0027) (011) 53 1814/93 8411. Tlx 4-21411. Af SWAf. SAf felids. Trade.

Wilson, Mr Vivian J., Chipangali Wildlife Trust, P.O. Box 1057, Bulawayo, ZIMBABWE. Tel: . EAf EqAf SAf WAf. African felids. Captive breeding.

Wotschikowsky, Dr Ulrich, Wildbiologische Gesellschaft, München e.V., Postfach 170, D-8103 Oberammergau, FED. REP. of GERMANY. Tel: (0 88 22) 63 63. Eur. Lynx.

Wright, Mrs Anne, Tollygunge Club Ltd, 120 Deshapran Sasmal Road, Calcutta 700033, INDIA. Tel: (0091) 33 46 7806/1922. SAs. Indian felids.

Xiang Peilun, Dr, Chongqing Zoo, Chongqing, CHINA. EAs. Captive breeding. Tiger.

Xiao Qianzhu, Professor, Northeast China Forestry Institute, Harbin, CHINA. EAs. Tiger. Chinese felids.

Yasuma, Dr Shigeki, WWF/Japan Scientific Committee, Dai 39 Mori Bldg, 2-4-5 Azabudai, Minato-ku, Tokyo 106, JAPAN. Tel: (0081) (03) 434 2221. Tlx: (0720) 2423793 ameoi j. EAs. Iriomote cat.

Zhyvatchenko, Professor V.I., Hunting and Hunting, Science Magazine, 107807 GSP Moscow B-53, Sadovaya-Spasskaya 18, USSR. Tel: 207 20 91. ul.

Perekopskaja 14 Korp.1, Kw. 133, Moscow 113209, USSR. CAs EAs EEur. Tiger, USSR felids.
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