CAT NEWS

CAT NEWS is the newsletter of the Cat Specialist Group of the Species Survival Commission of the International Union for Conservation of Nature and Natural Resources (IUCN). The group consists of leading international specialists on felids from over 30 countries, all of whom act in a honorary capacity as advisers to IUCN and other conservation organisations.

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FRIENDS OF THE CAT GROUP

Friends of the Cat Group pay an annual subscription to the Cat Specialist Group to support production of CAT NEWS and any other activities deemed by the Chairman to promote conservation of felids. The subscription provides for delivery of two editions of CAT NEWS.

The current subscription is $10 (or equivalent in other currencies). Cheques should be made payable to the IUCN Cat Specialist Group and sent to the Chairman, Peter Jackson, c/o IUCN Species Survival Commission, World Conservation Centre, 1196 Gland, Switzerland. Donations to promote the work of the Group are welcome.

COVER: Wildcat Felis sylvestris - 19th Century engraving
CAT NEWS 7

August 1987

The neotropical cats feature in this issue of CAT NEWS following a meeting of the Cat Group in Caracas, Venezuela, in April, along with comments by various specialists on draft data sheets prepared by IUCN's Wildlife Trade Monitoring Centre. Meanwhile, the Jaguar car company and the World Bank have come forward with funds to support reserves for these cats in Belize and the Brazilian pantanal. The World Bank's action is particularly significant as it marks a major step forward in policy towards protection of the natural environment. The Bank has been heavily criticised in the past for funding projects which have devastated vast areas.

The leopard too is in the news with a report by Rowan Martin and Tom de Meulenaer on its status in sub-Saharan Africa. The report, which estimates a population of about 700,000 leopard in the area on the basis of computer modelling, was presented to the Conference of the Parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in Ottawa in July. It will provide the basis for developing policies of CITES members on whether the leopard in sub-Saharan Africa should be moved from Appendix I to Appendix II of the Convention, which would permit international commercial exploitation.

The report, of which a summary appears in CAT NEWS, demands detailed evaluation. Most comments so far relate to a longer summary made available by the CITES Secretariat and express concern about some of the methods and assumptions of the authors. The full report, of which I have seen a draft, includes appendices justifying these methods and assumptions, and I suggest that detailed comment await the final text of about 105 pages, which is expected to be available from CITES by the end of October. It is not possible to say at present how much it will cost, but details will be circulated as soon as possible. Members of the Cat Group are invited to let me know on the enclosed form if they wish to have a copy for comment.

Livestock predation and trophy hunting are matters raised in both the above reports. It is apparent that there is little hope of conserving big cats outside reserves unless livestock predation can be reduced to a minimum and the owners given incentives to tolerate some cats on their land. I posed the issue of trophy hunting in the last issue of CAT NEWS and the responses of some of our colleagues are reproduced here. Read in conjunction with the report on leopard in sub-Saharan Africa the reactions indicate the impossibility of agreeing to a group policy on trophy hunting. I feel sure that the strong feelings expressed against hunting are shared by the
overwhelming majority, and probably all of our group, although some have come to the reluctant conclusion that tightly controlled hunting could contribute to the survival of species under strict conditions. The dilemma is most apparent in ranching country, where big cats take a toll of livestock. Wildlife authorities in Zimbabwe, for instance, argue strongly that trophy hunting is the only way to induce ranchers to permit big cats to survive on their land, and similar arguments are advanced as a means to conserve jaguar in Latin America. There is also the problem of dealing with cats which become pests by attacking livestock and, sometimes, humans. Translocation has not been successful and so killing is resorted to. Should the fatal shot be fired by an official executioner or by an avid hunter, who pays for the privilege? But even those who would admit the hunter are adamant that the utmost control must be exerted to see that innocent animals are not killed in the process, and few have confidence in the ability, or even the will of the authorities to exert such control.

WWF International has asked for the Cat Group’s recommendations on management of problem cats in view of meetings to be held in India next year when questions are likely to be raised about tiger attacks on livestock around reserves and cases of manslaughter. The Indian authorities concerned, Project Tiger, have guidelines for dealing with problem tigers, and recommendations have been made for management of human activities to minimize problems in the Dudhwa National Park area, where about 170 people have been killed by tigers in the past nine years. Compensation is also payable for loss of livestock. I shall be in touch with members whom I know have experience of big cat problems, but comments and advice from anyone would be welcome.

The proceedings of the Cat Symposium held at Texas A&I in 1982 are now available, and are reviewed briefly on p. 30. The symposium was put together in a relatively short time, and it makes me think that we should already be thinking about the next one. The World Parks Congress has set a pattern of a 10-year cycle. We cat specialists should think along those lines. What about 1990? It would not be 10 years since the Texas symposium, but it would avoid clashing with the fourth World Parks Congress in 1992. We would have up to three years to prepare a well-rounded programme, and it would allow time for some research to be carried out specifically for presentation on a major international forum, which could give a big boost to conservation. Apart from the usual themes of biological studies, status and conservation, there should be special emphasis on management of the large cats in the light of the constantly increasing problems of conflict between them and livestock, and a possible increase in attacks on humans as contact grows. If these magnificent animals are not to be confined to fragile reserves, often in barely viable numbers, conflict has to be minimized in a way that satisfies the local populations involved.

Peter Jackson
Chairman
THE NEOTROPICAL CATS

Deforestation, hunting and problems of controlling livestock predation by jaguar featured in a review of the status of the neotropical cats at a Cat Group meeting in Caracas, Venezuela, held in association with a session of the IUCN Species Survival Commission and in written comments on draft data sheets prepared by the IUCN Wildlife Trade Monitoring Unit.

Dr Wendell G. Swank, in a review (preliminary and not to be cited) of the status of jaguar, said that modification and loss of habitat was cited almost without exception throughout Latin America as the major cause of the decline of the cat. Reporting on a status survey carried out with Dr James Teer for submission to the US National Fish and Wildlife Foundation (a funding organisation associated with the Fish and Wildlife Service) he said this included especially forest elimination for subsistence agriculture and cattle ranching. Road construction, which opened up areas for development, was also leading indirectly to the jaguar's decline.

Dr Swank said that hunting was cited as the second most important activity, and throughout its range the jaguar was killed by local people at every opportunity due to fear and for the status of having killed a big cat. On the other hand, hunting of jaguar for commercial purposes had declined because the demand for skins had declined drastically, accompanied by a similar fall in prices.

"Either styles have changed or the curtailment of trade through CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) is beginning to have real effect on the take of jaguars".

Dr Swank said that most countries had good regulations prohibiting hunting and commercialization of jaguar, but enforcement was poor or non-existent. Permits were often issued to kill alleged cattle-killers without verification.

While legal sport hunting of jaguar had been permitted in Mexico in 1985 and 1986, it would not be allowed in 1987. Elsewhere sport hunting was not permitted.

"There is little sentiment for opening the season for sport hunting in any of the countries, primarily because there is apprehension about the ability of the government agencies to enforce any necessary regulations to control the take", Dr Swank reported.

After describing the decline of the jaguar at the fringes of its range in the US, northern Mexico, El Salvador, Argentina, Uruguay and eastern Brazil along the Atlantic coast, Dr Swank said the population was good in the Peten of Guatemala and adjacent areas of Mexico and Belize, as well as in the Amazon Basin of Brazil, south of the Orinoco in Venezuela, in inland undeveloped areas of Suriname and probably Guyana and French Guiana.

Dr Rafael Hoogesteijn said he calculated that an "optimistic estimate" of jaguar in Venezuela would be 2,500-3,600. Survival was assured in large areas of forest in Bolivar State and in Amazonas because of their inaccessibility. However, habitat destruction had been serious in tropical and gallery forests, especially west of Lake Maracaibo, the eastern upper llanos (central plains), northern coast and northern Bolivar State. Jaguar predation on livestock led to killing of any jaguar found. There were also "human jaguars" who killed
cattle for meat and blamed the cat. Jaguar were insecure even in protected areas north of the Orinoco because of lack of controls, poaching, fires and squatters.

Dr Hoogesteijn said the general wildlife situation was bad in the flooded plains area, especially in regard to capybara and caiman, because of poaching, even on private ranches.

He said that while the jaguar was legally protected, including from commerce in skins, further measures were needed. Hunting was banned, but the jaguar was still on the list of game animals and could be subjected to sport hunting, which was undesirable.

Dr Hoogesteijn said there were no regulations in Venezuela to deal with jaguar predation on cattle and there were no benefits for the species or stock owners, who only wished to destroy the pests. He proposed a system by which pest jaguar be officially identified by a Ministry of Environment expert and a representative of a conservation organization, such as FUDENA (Venezuelan Foundation for Nature Conservation). The cat's footprint should be measured and its hunting area identified. A hunt could then be auctioned for Venezuelan or foreign hunters. Shooting should only be from a blind over domestic prey or after tracking by dogs from the prey so that innocent jaguar were not killed. The proceeds should be divided between the cattle owner, the hunter/guide, and the Ministry of the Environment. Dr Hoogesteijn suggested that the scheme could be tried experimentally on conservation-oriented ranches, while an intensive education programme should be carried out through cattlemen's organisations to create awareness of economic, biological and ethical benefits of protecting jaguar. Fines and imprisonment should be increased to deter killing of non-problem jaguar.

Dr Hoogesteijn also proposed that as a first step in a captive breeding programme the origin of zoo specimens in Latin American countries should be ascertained and a studbook started in order to maintain a pure stock of subspecies.

Regarding ocelot, Dr Hoogesteijn said there was no problem in Venezuela, although there was some small-scale smuggling. Ocelot were common in forests, on ranches with good gallery forest and in some heavily-forested national parks. As with the jaguar the real threat was loss of habitat, which amounted to 50,000 ha a year in the western plains, and 100,000 ha in the whole of the country. Lower oil prices and the decline in value of Venezuelan currency encouraged conversion of forest to cropland because imports, which had amounted to 50% of the country's food, had become too expensive. He said that some ocelot were hunted because they raided chicken runs, but there was no active hunting as there had been in the past when Colombian traders had bartered goods for skins, thus encouraging weekend hunting.

Margay and oncilla were much rarer than ocelot and more sparsely distributed. They were more affected by deforestation in sub-tropical and cloud forests.

Dr Hoogesteijn declared that Venezuela needed more protected areas for all spotted cats.
Dr Jorge Rabinovich stressed the general lack of information about Latin American cats and suggested three critical categories:

1. Ecological information, which included the carrying capacity of the environment, the potential population growth rate, the present numbers in terms of density, and how these factors related to different types or qualities of habitat.

2. Socio-economic information involving studies of the pattern of exploitation from hunter via stockpiler/middleman, tannery, commerce and export.

3. Administrative and legal information. Legal information on cat status was available and needed only to be loaded into a data bank. But written laws meant little in Latin America without adequate administrative structures and manpower. It was necessary to find out how administration of faunal resources was organized, how it related to other authorities, how it was affected by political factors, how big was the turnover of civil servants etc. The answers, easy to obtain, were essential to understanding the harvest and trade, legal and illegal, in lesser cat skins.

Dr John Eisenberg quoted notes derived from the work of Drs Mel Sunquist, Mike Koneckni and Mark Ludlow in Belize and Venezuela (he is editing the full data for publication shortly by University of California Press).

**Ocelot Felis pardalis.**

In both Belize and Venezuela the ocelot appears to be nocturnal. Although it will rest in trees, it seems to hunt terrestrially. It is strongly associated with forested habitats, but can range into the llanos of Venezuela, making use of gallery forests associated with streams and rivers. Adult females defend an exclusive territory. The territories of males overlap one or more female territories. In riparian habitats with high carrying capacity, the ocelot can exist at densities of approximately three per square kilometres. Primarily carnivorous, the ocelot in Venezuela is an opportunistic feeder, taking small vertebrate prey that happen to be at high numerical densities. In short, it tracks prey availability and will feed extensively on the cane rate during population highs.

**Margay Felis wiedii**

The margay is definitely arboreal and hunts arboreally. It is also primarily nocturnal and seems to be strongly associated with moist forested habitats. In the broad sense the margay appears to have a lower density than that of the ocelot, but in areas of prime habitat (moist, premontane forests) the margay cat may actually be more abundant than the ocelot. Data from Belize indicate that some fruit (about 10%) is taken in addition to small vertebrates.

**Oncilla Felis tigrina**

The little spotted cat is poorly known. Data from Venezuela indicate that it is very strongly associated with moist forest. Analysis of stomach contents suggests that this cat takes smaller vertebrate prey than does the ocelot. Thus some resource partitioning may occur where the two species live in sympathy.
Dr Eisenberg added that he had the feeling that, as the ocelot became rare over much of its range, there was a switch to taking Geoffroy's cat Felis geoffroyi. This might mean that the latter species, if not already, would soon be threatened.

Dr Mel Sunquist contested the suggestion by Dr Wayne Melquist in a draft survey of the status of Latin American cats for CITES (1984) that several species could be harvested on a sustained basis, on the grounds that so little population data were available. Referring to the ocelot, he said that it had wide distribution, but from studies in Brazil, Peru, Belize, Venezuela and Texas it was evident that it attained high densities only in areas of dense cover. Open areas with patches of cover were used by ocelots only at night, and the ranges of individuals were much larger where habitat was fragmented. Estimates by his group in a mosaic of habitats in Venezuela were 0.4 adults per square kilometre compared with one per square kilometre estimated by Dr Louise Emmons in tropical rainforest in Peru. He calculated that an area of 2,535 km² was necessary to maintain an effective population size of 500 ocelot, the actual population size being 1,334 adults, including 1,000 females. However, the area would vary in relation to habitat quality and sex ratio.

On reproduction, Dr Sunquist said data were limited but in optimum conditions litters of 1-2 appeared common with an interbirth interval of probably at least one year. Although there was a potential recruitment of 1,000 each year, assuming each of 1,000 females successfully raised one young to independence, there was the question of the fate of subadults. In Venezuela one in two of male dispersers was killed, whereas in Texas three or four were killed before settling. Because of the likely high mortality of dispersers the actual recruiting might actually be closer to 300. Thus he found it hard to believe that the harvest could be controlled to limit the take to appropriate numbers.

Dr Sunquist remarked that margay in Belize were found to be highly arboreal and thus tied to dense forest cover. Margay appeared to be more of a habitat specialist than any of the other small cats.

Dr Gustav Peters pointed to the danger of giving different protection status in CITES and other classifications to subspecies within species. He said that nobody could distinguish subspecies with certainty. Most had been described from limited material and so it was quite safe to assume that a large number were not 'good' subspecies."

Dr Peters also took issue with Melquist's suggestion that F. tigrina, F. geoffroyi could sustain controlled harvests. Controls in countries of origin did not work. Calling for import bans because no population data were available, Dr Peters declared: "Only after sound data on distribution and populations of these neotropical species are available and public opinion in the consumer countries has changed to a new attitude towards wearing coats of felids taken from the wild, can controlled harvest of some forms be considered."

Dr Louise H. Emmons sent copies of papers on her studies of felids in rainforests in Peru's Manu National Park. She found from study of scats that terrestrial mammals were the chief prey of jaguar, puma and ocelot, but reptiles and birds were also numerically important in the diets of ocelot and jaguar. Cats evidently took any readily captured vertebrate. Peccaries were taken more often than expected by jaguar and they also captured caiman and
turtles. Puma did not use waterside habitats or take caiman and turtles. The survival of the jaguar was threatened not only by skin hunters and habitat destruction, but also by extinction of many of its prey species.

Dr Emmons radio-tracked ocelots and found them to be active at any time of day, but usually they rested in the morning, became active in mid- to late-afternoon, and continued activity until after dawn the following morning, with one rest period during the night. Breeding females occupied mutually exclusive territories, but an old female was tolerated on their territories by her former neighbours when the latter had no dependent young. Adult males occupied large territories that overlapped three or more females' ranges. Circumstantial evidence indicated that females in the study area produced young every other year. An 80% grown female was already wandering, but two 80% grown males occupied small ranges within their presumed mother's territories. The disappearance of an old adult male and the establishment of another coincided with changes in the status of all collared residents. Although ocelot hunted, travelled and usually denned alone, they often met - 37 encounters between collared cats were recorded during radio-tracking. One male encountered four other radio-collared ocelots in 24 hours.

Dr Jose Lobão Tello, in a report on a five-month survey of Bolivian felidae for CITES between June and October 1986, made the following points.

**JAGUAR Panthera onca**

Jaguar are widely distributed in all areas below 3,000m and in general are considered common and even locally abundant, particularly below 1,000m. However, they are rare or severely declining near towns and larger villages. They are common on large cattle ranches. A high percentage of jaguar killed each year in Bolivia are shot opportunistically along roads. Jaguar are considered a considerable nuisance to cattle, horses and pigs.

Jaguar are under heavy hunting pressure, which is causing a decline in the population and is the major threat to the species. They are generally shot at sight, and also hunted with dogs, as well as by professionals employed by ranchers. In Santa Cruz Department the last farmers' congress demanded the elimination of jaguar from their land. Tello believes that perhaps 300-400 jaguar are killed annually, but he finds it impossible to define the trend in the overall population.

However, Tello goes on: "I am convinced that jaguars will be protected on the majority of larger ranches if the species comes under a sound management programme e.g. hunting and photographic safaris, but mainly hunting, provided that farms receive a financial return that will pay for all their domestic animals killed by jaguars. As a consequence of a sound management programme for this species on the ranches, specific important habitats will also be saved and other animals species such as marsh deer Blastoceros dichotomus, pampas deer Ozotoceros bezoarticus, and brocket deer Mazama spp., peccaries Catagonus wagleri, Tayassu tajacu and T. albirostris, tapirs Tapirus terrestris etc will also receive protection. The increase of natural prey will decrease the predation by jaguars on domestic livestock.

**PUMA Felis concolor**

Puma are widely distributed throughout most of Bolivia and common in most of the region below 2,000m, particularly in lowland humid forests, including cattle ranching regions. Puma are not considered a severe threat to cattle,
but they kill calves, pigs and other small livestock. While they are not deliberately hunted they are shot at sight. Some Indians and other rural Bolivians hunt puma for food.

Tello does not consider puma highly threatened by opportunistic hunting, except near towns and larger villages, nor is it endangered by habitat change, except in developed agricultural areas, where natural cover has been completely destroyed. However, Bolivian puma could be seriously affected by heavy hunting of deer and a decline in the population of rhea *Rhea americana*, which seems to be the most important prey.

**PAMPAS CAT Felis colocolo**

The pampas cat appears to be widely distributed over a large area of Bolivia, except above 3,000m and from large floodplains below 200m. The status is insufficiently known. The skins have limited commercial value.

**MARGAY F. wiedii**

Widely distributed, occurring in all the subtropical and tropical regions as well as in the Indian valleys, at least below 3,000m.

Tello recalls that the margay was recently considered endangered in Bolivia, but he considers that the species has made a very good recovery and he strongly believes that it is out danger in rural areas and is common in forest areas. Margay does not appear to be endangered by habitat changes, except on agricultural lands where natural habitat has been totally destroyed. The major threat to the margay is professional hunting, especially with traps.

**OCELOT F. pardalis**

Widely distributed, occurring from the tropical valleys of the Andes at elevations of 3,000m to lower areas in the east. Tello does not consider the species in danger, and declares that if it was so, as had been suggested, then it has made a considerable recovery. The species has a wide habitat tolerance and adapts to living near human settlements, and thus is not threatened by habitat loss, except in intensive farming areas. The only serious threat is uncontrolled professional hunting with traps, which does not occur at present in Bolivia.

**JAGUARUNDI F. yagouaroundi**

Jaguarundi are common and probably abundant. They are reported from almost every type of habitat in all regions below 2,000m. Local informants said it was particularly common around rural houses, where it preys on poultry. The skin does not have commercial value and the jaguarundi is not a trophy animal. Tello declares that the jaguarundi is not threatened either by habitat loss or hunting.

**MOUNTAIN CAT F. jacobita**

The mountain cat does not occur in the region Tello surveyed, although recorded from the higher areas of Oruro, Potosi, Tarija and Chiquissaca Provinces. The status and ecology and not known.
TIGER CAT F. tigrina

Tello states that no scientific specimens of the tiger cat have been collected in Bolivia nor in the immediate vicinity in adjacent countries. He found no evidence of it, and believes that skins exported from Bolivia as tiger cat were smuggled from neighbouring countries.

GENERAL COMMENTS AND RECOMMENDATIONS

Tello describes the wildlife situation in Bolivia as "catastrophic", with a number of species endangered, including all the primates, as well as deer, capybara, peccaries and tapir. But he believes that the situation could be saved given total reorganisation of the wildlife sector of government and economic and scientific help from outside. He strongly urges an immediate project for management of jaguar in cattle areas with a minimum of eight months field work to determine population status, hunting quotas and areas, and protection measures.

JAGUAR RESERVE GETS FINANCIAL SUPPORT

Jaguar Cars companies in the Britain, Canada and USA have pledged over $70,000 to support the Cockscomb Basin Jaguar Reserve in Belize.

The reserve was created in 1984 on the recommendation of Dr Alan Rabinowitz after his two-year study of jaguar in the area.

Announcing the donation at a press conference in Washington on 15 April, Mr Graham W. Whitehead, President of Jaguar Cars Inc. (US) said: "We are pleased to play a key role in aiding the survival of the jaguar – from which our corporate symbol was derived. We are proud to be associated with theformal attempt to protect the jaguar species, an animal of great beauty, agility and distinctiveness. Since the Company was founded in 1935, we have tried to emulate these characteristics in designing our cars."

The donation is via WWF/US, which is managing the project for the protection and development of the Cockscomb Reserve.

WORLD BANK LOAN FOR BRAZILIAN PANTANAL RESERVES

Jaguar and other cats will benefit from the World Bank's first environmental conservation project - a loan of up to $100,000,000 for a reserve of 11 million hectares in the Brazilian pantanal.

A condition of the loan is that the Brazilian government puts up an equal amount.

The pantanal is a vast swampland covering an area equal to the Netherlands, Belgium and Switzerland together, which Dr Thomas Lovejoy, Vice-President for Science of WWF/US, describes as a "wildlife paradise".

Dr Lovejoy, who is coordinating the project, told a press conference in Washington, that the pantanal was being damaged by dykes built by ranchers, which converted the pantanal swamps into scrubland and displacing floodwaters which did harm elsewhere.
Largescale poaching, especially for caiman, has also been going on. But according to wildlife specialist Arne Sucksdorf jaguar have increased during a 10-year ban on hunting.

A Sao Paulo rancher, Mr Roberto Klabin, who plans to develop tourism on his 52,000 ha ranch, said that he loses about 150 cattle a year to jaguar, but considers it a "contribution to conservation".

A REPORT ON AFRICA'S LEOPARDS

The leopard population of sub-Saharan Africa has been estimated by computer modelling at about 700,000 in a report presented to the CITES Conference of the Parties in Ottawa on 14 July.

The report, which also discusses possible exploitation of leopard, was prepared by Rowan Martin of Zimbabwe's National Parks and Wildlife Department and Tom de Meulenaar of TRAFFIC (Belgium), part of a network which collects wildlife trade statistics. It was requested in the context of the longstanding discussion within CITES on whether the African leopard should remain on Appendix I, which includes species threatened with extinction and banned from commercial trade, or be transferred to Appendix II, which includes species which are not currently endangered but might become so if trade is not controlled.

There is no current proposal to transfer the African leopard to Appendix II, and the matter could only considered if a proposal is made for the next CITES Conference in 1989. Perez Olinde of Kenya, on behalf of the African delegations present, expressed appreciation of the report, but said there had been insufficient time to study the data. The group believed that the leopard should remain on Appendix I pending consideration of the report.

India's delegate, Dr M.K. Ranjitsinh, said the report represented an important step forward, but expressed concern that such reports would be used by governments to establish policies that wildlife must be exploited. The delegate questioned the model's validity and the safety of assuming that leopards were at maximum density wherever they occurred. If trade in leopard furs were to restart it would set back the progress achieved in conservation over the past few years.

These are some key points in the report:

1. Leopards are a species to which a "Complete Compensation Model" is applicable since the population tends towards saturation density as subadults seek territories.

2. A leopard population can either sustain harvesting with no detectable change in the population, or the harvest is too high, in which case the population is headed for extinction. The population can be reduced to a very low level under heavy harvest, but if the harvest is not maintained the population will bounce back to maximum density.

3. Predator populations are limited by food supply, which, in Africa, is determined by biological productivity determined by rainfall. On this basis a mathematical model was constructed using the available habitats used by leopards, available estimates of leopard density, and the extent of available habitat to plot leopard numbers against rainfall.
4. The result was an estimated population of 700,000 leopard, with confidence limits of 600,000 to 850,000.

5. The method was cross-checked by comparing the model estimate of 10,000-12,000 leopard in Kenya with the estimate produced completely differently by Patrick Hamilton (1981). The result was substantially the same.

6. Leopard numbers depend on available habitat, and this is being reduced at the rate of 2-3% p.a. in Africa, thus halving the leopard population in about 35 years.

7. About 6,000 leopard are killed annually in Africa by sport hunting, for control and trade (including illegal trade).

8. Overall the fur trade at its height did not seriously affect the African leopard population.

9. A safe harvest for leopard could be between five and 10%.

10. A 5% harvest would produce an income of $30 million for African countries. Those wishing to protect the leopard at all costs should be prepared to pay this amount.

As Cat Group Chairman I made the following statement at the meeting:

"This is the first attempt at a serious scientific assessment of leopard numbers, and the method used appears to be well-designed. However, the figures remain unconfirmed by "ground truth", except in Kenya, where they closely match surveys by Patrick Hamilton. If the population figures prove to be accurate elsewhere, the method offers an extremely valuable way of assessing other felid populations. Intensive status studies are required in various representative habitats to ascertain the validity of the method.

"The report confirms the finding by Myers (1976) that the leopard is not endangered in sub-Saharan Africa, and is therefore a candidate for CITES Appendix II as it is certainly vulnerable to excessive exploitation. However, there is the problem of "look-alike", because no detailed surveys of leopard populations have been carried out in North Africa and Asia, where five sub-species are already classed as "Endangered", and others are known to be extremely rare and threatened. While it is unlikely that any substantial illegal trade in these species would occur, nevertheless their status is such that removal of even a few individuals could lead to extinction of the race. Any decision to change the status of the leopard in sub-Saharan Africa must be taken in this light.

"Regarding the proposals for exploitation of leopard in sub-Saharan Africa, I recognize the value it could have for conservation of the species while personally disliking the idea of killing leopards, except when necessary to protect human interests. It appears to be the experience of countries with well-managed wildlife populations, such as Zimbabwe, that income-producing safari hunting can induce livestock owners to tolerate leopard on their land, which they would otherwise have wiped out. But in non-ranching areas it may be difficult to ensure that graziers receive a proper return from any trophy hunting. Fears have also been expressed that the large sums involved could lead to corruption, and that many countries lack the infrastructure to assert necessary controls. Fragmentation of habitat could lead to extinction of isolated populations."
"As far as the skin trade is concerned it is said that there is little desire by furriers to reopen the fashion market for spotted cats. However that may be at present, the possibility of a future fashion drive cannot be ruled out. A new spotted cat skin fashion boom could lead to devastating pressure on vulnerable leopard populations, even though not threatening the species.

"Obviously, governments have the right to manage their wildlife populations, but it should be done in a way consonant with the common responsibility of humanity to conserve the world's natural heritage.

"In short, while accepting that the leopard could be on Appendix II since it is not endangered as a species, although vulnerable to excessive exploitation, I believe that careful consideration has to be given to ensuring, in advance of any change of status, that leopard populations will not be over-exploited."

LEOPARD IN CAPE PROVINCE, SOUTH AFRICA

Leopard are widely distributed in South Africa's Cape Province and are a serious problem for livestock owners, according to a report by Peter Norton following a study on behalf of the Department of Nature and Environmental Conservation.

The report covers leopard biology, especially movements and feeding behaviour in Cape Province; the conservation status with recommendations, including the feasibility of sanctuaries; leopard as a problem animal with recommendations on reducing stock losses; and creation of awareness of the problems of leopard conservation both among the public and stock farmers.

Some key points of the report are as follows:

1. In the Cape Province leopards are still widespread in suitable habitat.

2. The distribution of stock-farming in the province is such that leopard problems have been recorded wherever the species is known to occur.

3. The most important problem areas border on extensive forestry reserves where the leopard populations are protected. This suggests that methods of containing them should be investigated.

4. Many of the leopards caught for stock-raiding are prime adult animals rather than dispersing sub-adults or old animals.

5. In spite of years of persecution relatively large numbers of leopards are still being killed annually, suggesting that, even if the population is declining, it is not in a phase of rapid decline.

Thus the leopard is not "endangered" in the strict sense of the word, Norton concludes, but in common with many other large carnivores its habit of catching livestock wherever it occurs means that the populations will come under increasing pressure as intensive stock-farming moves into marginal habitats.
LEOPARD SKIN QUOTAS

The CITES Conference of the Parties agreed to the following annual export quotas of whole or near-whole leopard skins for the next two years (earlier quotas for comparison) pending review of the relevant resolution at the next Conference:

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Quotas for leopard, despite its inclusion in Appendix I, which bans international commercial trade, were first approved by the Conference of the Parties in Botswana in 1983 in a resolution "recognizing that the killing of specimens of leopard may be sanctioned by countries of export in defense of life and property and to enhance the survival of the species, and that the leopard is in no way endangered in Botswana, Kenya, Malawi, Mozambique, Tanzania, Zambia or Zimbabwe".

The Resolution also recognized "the overwhelming desire of the Parties that the commercial market for leopard skins should not be reopened".

The original quotas were modified at the Buenos Aires Conference in 1985. At this year's Ottawa Conference the Central African Republic applied for a quota on the grounds that, although there had been no census in the approximately 110,000 km² of leopard habitat, information from trackers and hunting guides confirmed that the leopard population had "reached a high reproduction level".

It said there was "near disappearance of baboons, which are their main prey" and declared that leopards were creating problems in some areas by "mass killing of kids...and aggression against old people and small children". Every year about 30 control hunts were officially authorized.

The request said leopard hunting been prohibited for 26 years, poaching was "very limited", with individuals rarely offering skins to tourists, and the local handicraft industry not interested in them.

The request was approved.

Ethiopia's delegate said that his Government intended to become a Party to CITES and requested a quota for export of 500 leopard skins for the next three years, and 300 for subsequent years. He said leopard skin stocks had accumulated from confiscation and killing for livestock protection. Despite reservations because of the lack of data, the request was granted after discussions with Rowan Martin (author of the leopard survey report) and some African delegates.
A CITES Secretariat report to the Conference said that six of the seven quota states had not exported the number of skins allowable in 1985 and 1986. The exception, Botswana, had reported 99 skins exported in 1985 against its quota of 80, and had not reported for 1986, although Martin and Are Meulenaar said in their report that the quota had been used. Their report estimated that about 160 skins from leopards killed as hunting trophies or for livestock protection could be exported annually. The Botswana delegate did not, however, ask for a higher quota for the next two years, although specifically asked whether one was required.

The USA expressed concern about trade in Appendix I species continuing under the quota system, but recognized that time was needed for the Parties to review the new information on leopards. It therefore agreed to the continued quotas until review in 1989.

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MAN-EATING LEOPARD SHOT IN NEPAL

A maneating leopard operating in the Pokhara area of Nepal, which had killed a number of children, has been shot by Royal Palace hunters, Charles MacDougall reports from Kathmandu.

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LEOPARD NEWS FROM CHINA

Tan Bangjie reports that police at Fuzhou bus station confiscated two leopards among 52 other wild animals in the hands of illegal traders between December 1986 and January 1987, according to a report received by the Chinese Wildlife Conservation Association.

Local people killed a leopard which invaded a farmer's house near Shiyan, western Hubei, the local radio station reported on 6 February.

A worker discovered a dead leopard on Wulip Mountain about 80 km northwest of Beijing in February and sold the skin for ¥500. He was arrested and the money confiscated. Tan Bangjie says it is believed that the leopard had been trapped by someone a few days earlier, but escaped and died of wounds.

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LEOPARD IN SRI LANKA

Charles Santiapillai reports that the leopard Panthera pardus kotiya in Sri Lanka is now "clearly endangered" and that existing protected areas are unlikely to support more than 600 animals.

"Unless firm action is taken now, its prospects for longterm survival look pretty bleak indeed. Legal protection alone cannot ensure the survival of the leopard in Sri Lanka in the face of rapid conversion of forests to agriculture and human settlement," he adds.

Santiapillai estimated a leopard population of 400-600 in 1982, based on an average density of one to 20-30 km². Serious decline began with the accelerated development of the Mahaweli Ganga River to irrigate 363,600 ha covered by lowland forest to settle nearly one million people. Leopard have been extinguished in some areas and the population fragmented elsewhere leaving isolated populations near the minimum critical size. The conflict between Tamils and Sinhalese and the widespread availability of arms had led to
increased poaching of leopard prey species, while the leopard itself was vulnerable because of the high commercial value of the skin. Forest cover in Sri Lanka was estimated to have fallen from 44% in 1956 to 25% in 1981 as a result of conversion to agriculture.

Santiapillai declares that the basis of conservation must be to separate human settlements from wildlife refuges, although given the small area of Sri Lanka the refuges would be subject to the influence of human populations. He notes that out of the 460,000 ha in and around the Mahaweli Development area, 45% is to be set aside for protected areas, but says that buffer zones and forms of multiple use were required. In addition prompt and adequate compensation should be paid for livestock taken by leopard.

LEOPARDS AND TRAFFIC JAMS

In the October 1986 issue of BBC Wildlife film producer Hugh Miles, maker of a highly acclaimed film of leopard in Masai Mara, drew attention to the damaging harassment of leopard by tourist vehicles. Now the manager of one of the lodges, Mr. K. Ammann, has written to the magazine pointing out that film crews contribute to the problem by working on the leopards during the periods the tourists are absent, and also serving as markers for tourist vehicles.

TRANSFER OF SIBERIAN TIGER FROM CITES App.II TO App I

The Siberian tiger Panthera tigris altaica was moved to Appendix I of CITES at the Conference of the Parties in Ottawa in July, thus banning international commercial trade. This ends an anomaly by which the Siberian tiger was the only subspecies not on Appendix I, despite the fact that it is one of the rarest in the wild.

The transfer, which was proposed by Switzerland and had been recommended by the Cat Specialist Group, was opposed by the USSR on the grounds that the Siberian tiger was not threatened with extinction because it was well protected in the USSR and there was a world captive population of over 600.

Dr. Vladimir Flint, the Soviet delegate, said that the number of Siberian tigers in the USSR was considered too high, and there was a lack of natural prey, so that they had been attacking livestock and dogs. They had also become aggressive towards humans, with two people killed and two injured in 1986. The matter had been discussed by the Soviet authorities and it had been decided to reduce the population from the current 350-380 to 300. Local authorities had been authorised to start the cull, concentrating on aggressive tigers and those taking livestock. At the same time hunting of prey species (deer and pig) had been suspended for two years to allow populations to recover.

Dr. Flint said there was no international market for Siberian tigers since the captive population in zoos numbered over 600 and even cubs found no buyers. The USSR was considering trade in tiger products, such as skin and bones.

As Chairman, IUCN/SSC Cat Specialist Group, I said that the Group recognised the conservation measures taken by the USSR for the Siberian tiger. However, at a meeting in 1984, the members present recommended that the subspecies be moved to App.I. Transfer of the Siberian tiger to App.I would not prevent international movement of specimens for scientific purposes. It
was not possible to countenance commercial trade in a subspecies numbering less than 500 in the wild in the USSR, China and Korea. Even considering the captive population of over 600, the Siberian tiger was less numerous than other subspecies which had the full protection of App.I. While live specimens and skins of Siberian tiger were usually distinguishable from other subspecies, this was not true of parts, such as bones, for which there was a substantial market for medicinal purposes in east Asia. There was a real possibility that permitting a commercial trade in Siberian tiger products could lead to illegal traffic in parts of other subspecies.

As far as surplus live specimens were concerned, I said that there was certainly a need for fresh blood in the captive population, and I had had requests for help in obtaining it.

I recommended that the USSR's objection be overruled and that the Siberian tiger join other subspecies on App.I. Any reservation taken by the USSR in order to disregard the CITES listing was to be deplored, while hoping that it would be withdrawn on mature consideration in the light of the serious plight of the tiger as a species.

China supported my stand, noting that a potential for trade in tiger specimens existed, and Kenya stated that the low population estimates of Siberian tiger warranted international trade controls. Kenya and Brazil urged the USSR to reconsider its intention to enter a reservation, and India offered assistance to any Party experiencing problems with tigers. The proposal was supported by UK. The Committee of the Parties voted 49-2 (USSR and Costa Rica) in favour of moving the Siberian tiger to Appendix I.

Dr Flint told me afterwards that he proposed to discuss the matter on his return to Moscow.

Meanwhile, Dr Victor Korkishko of the Far Eastern Science Centre in Vladivostock has written to say that press reports of aggressive tigers "somewhat exaggerate a problem." He says there are no maneating tigers in the region, and there has been only one case in Primorye this century when a tiger treated a man as prey and killed him, after which the tiger was shot.

"It is true that in the last few years tiger predation on livestock and meetings with men have become more frequent. In some cases the tigers attacked hunters and seriously injured them. But in the overwhelming majority of cases the tiger attacked after the man had used a gun or a dog was near a man. Hunters often exaggerate a threat and shoot."

Relating a personal experience Dr Korkishko said that last winter he met a tiger, which took the initiative. The tiger was within five metres for an hour and at times approached to half a metre. It had had a good chance to attack but they parted peacefully. There have been many other similar cases.

"Nevertheless, humans do not feel secure in the neighbourhood of the big cat, although they have never shown any panic as had been suggested in the press, Dr Korkishko said."

Another Russian biologist, who has recently visited tiger areas, said biologists believed there were not more than 200 Siberian tigers left, and strongly opposed any hunting or culling operation.
GIRL SURVIVES TIGER ATTACK IN NEPAL

A 15-year-old girl was bitten on the head by a tigress while cutting thatch grass in Royal Chitwan National Park earlier this year, but survived despite one of the canines penetrating her skull.

Charles MacDougal reports that he saw the girl a month after the attack and she was doing fine. The wound was still open but clean and being treated daily. The attack occurred when grass-cutters inadvertently surrounded the tigress, which bit the girl while escaping.

Two other attacks took place during the grass cutting. A woman escaped with a bite out of her thigh by a tigress, which had been resting with newly-born cubs when disturbed. In the other incident a woman was killed and half eaten on the park boundary. There had been no other recent maneating incidents.

(Shortly after MacDougal had written, the newspaper Rising Nepal reported that a maneater was creating chaos in the eastern sector of the Chitwan Park. The half-eaten body of a watchman had been found, people had been mauled, and cattle were being taken, it said)

MacDougal says that during a survey with David Smith in western Nepal "a lot more tigers than expected" were located outside reserves in "almost every fairly decent bit of habitat we looked at". There was continuous distribution of tiger all the way from the eastern edge of Banke District extending in a belt through Bardiya and Kailali Districts and into Kanchipur. But there was no link to Sukla Phanta reserve, and the last corridors by which tigers might cross into India had disappeared, as had been expected.

CHINESE FIRES THREATEN TIGER?

Widespread forest fires in northeast China might threaten the future of the Manchurian (Siberian) tiger Panthera tigris altaica, according to Keith Laidler writing in The Guardian, London.

The fires are reported to have destroyed 3.7 million hectares of forest and killed hundreds of people. Although none of the nature reserves in which tigers are conserved was burnt, Laidler says that the destruction of so much forest could lead to pressure to open up logging in them to provide timber for construction, thus destroying the habitat.

The Forest Minister, Yang Zhong, has been sacked in the wake of the fires, the New China Newsagency reported.

According to Tan Dangjie there are fewer than 50 altaica left, and they are hunted, primarily for bones for medical purposes.

TIGER BREEDING STATION TO PROVIDE BONES PROPOSED

The Chinese National Pharmaceutical Bureau has recently entrusted the Beijing Pharmaceutical Company with the task of drawing up a plan for a tiger breeding station in the vicinity of Beijing to solve the problem of the shortage of tiger bone.
Tan Bangjie says the bone is essential for the manufacture of drug wine, which is sold widely in southeast Asia, and the shortage of bone is driving up the price, which is now 1,500-2,000 Yuan ($400-540) per kg.

Live tigers are being exchanged between Chinese zoos at a price of ¥20,000 ($5,400) for cubs and ¥30,000 ($7,600).

All the Siberian tigers P.t. altaica imported into China from North America in 1983-84 have been concentrated by the Ministry of Forestry at a wild animal farm at Heng-dao-he-zi, near Mudanjiang in southern Heilongjiang Province. The plan is to breed tigers there and make a profit, Tan Bangjie says.

The newspaper GUAN MING RI BAO published a reader's letter on 3 April saying he had seen many stalls selling tiger bone and other tiger products in open markets in Kunming recently. He was startled to find as many as eight full tiger skeletons in the market, and he asked how could so many tigers, which were nationally protected animals, be killed and offered for sale. He appealed for a ban on tiger product sales.

Tan Bangjie comments that it is an open secret that the trade in wild animals and their products on the Sino-Burmese border in western Yunnan, especially around Cang-yuan (23°N-99°E), has been going on quite normally in the past few years. Chinese zoos and merchants have brought a number of young and adult tigers from Burma through this channel, he says.

For the first time since 1956 there has been evidence of a tiger in Huang-sang Nature Reserve (26°50’N-110°20’E) in southwest Hunan Province. It was heard at midnight on 3 March and footprints were found next morning, according to the China Environmental Journal.

Farmer Liao Shou-xun of Helping village (27°50’N-117°50’E) in northwest Fujian Province captured a newborn tiger weighing 850g. on Mikuxian Mountain on the Fujian-Jiangxi border on 9 March. After 20 days of feeding it had grown to 1,350 g. Liao informed Tan Bangjie that he would present it to a zoo when it was bigger.

Xiao Chang-chun, a staff worker at a lumber yard at Le-chang County in northern Guangdong Province, informed Tan Banjie that the local gazette of Shaoquan had appealed to hunters to exterminate a South China tiger recently discovered in Guitou District (25°N-113°50’E), north of Shaogang.

A report in the China Daily of 24 July said that farmers in Jinxian County, Jiangxi Province, were complaining that wild pig were running wild and eating up large tracts around their paddy fields, causing heavy grain losses. The newspaper quoted and official of the China Wildlife Conservation Association, who had visited the area, as saying that the reason was that the South China tiger, which used to eat the pigs had been wiped out in the area. The paper said that in a township in Jiangxi tigers skins were on sale for about 1,000 Yuan ($270), and the price of a stuffed tiger was 2,000-3,000 Yuan ($540-810).

The official told the newspaper that the local authorities had been asked to stop illegal hunting of tiger and to ban the fur market, but they had replied that the fur market produced over 1.2 million yuan ($324,000) in taxes.
TIGERS IN THE INDIAN PARLIAMENT

Ten tigers have been found dead in and around Dudhwa National Park, near India's border with southwest Nepal, the Minister for Environment and Forests, Bhajan Lal, told the upper house of Parliament, the Rajya Sabha, on 5 May.

He said one tiger had been run over by a train in the park, another had been killed in a fight with another tiger, and a third had been poisoned. Of the seven found dead outside the park, the government had recovered two skins and five skeletons. Two boys who had been arrested were released by lower courts, he said.

Replying to a member who asked whether the government was aware that tigers were being exterminated by poachers and the ecology of the Dudhwa park was being destroyed by illegal tree felling, Bhajan Lal said that out of the 450 km² are of the park, 123 km² was earmarked as a buffer zone. This was too small for the tiger population, and, as a result, tigers had killed 170 people around the park. He denied that there was poaching, but said 10 km² had been affected by illegal felling of trees.

Bhajan Lal said that Rs100.63 million ($7,750,000) had been earmarked for anti-poaching work in national parks during the Seventh Five Year Plan, and the number of guards had been increased. State Governments had been advised to put up fencing to stop tigers moving out of the parks. The Central Government would give 100 per cent assistance to State Governments to protect wildlife, he said.

Stating that there were 4,000 tigers in India, Bhajan Lal said it was not a big number, but added: "If the number increases we will consider their export".

In the Uttar Pradesh Assembly, the Forest Minister, Zafar Ali Naqvi, said 72 tigers were known to have died in UP forests in the past five years, including six in national parks. Among the dead ten were shot for maneating, 17 were killed by poachers, eight died in fights, and two others from drowning. Villagers killed six tigers in selfdefence and one was run over by a train. (According to the 1984 census there were about 700 tigers in the State.

(An eyewitness report refutes the suggestion that a tiger was run over by a train, since the locomotives have cow-catchers, and the dead tiger, when found near the railway track, had all four legs and head cut off cleanly as though with an instrument).

TIGER PURSUES PREY FOR OVER TWO HOURS

A tiger in the Eravikulam National Park in Kerala, South India, was observed to pursue a wounded sambar for over two hours travelling two kilometres.

Dr Clifford Rice, who was studying the Nilgiri tahr Hemitragus hylocrius gives the following account in the Journal of the Bombay Natural History Society, Vol 83, No.2:

16.18h - Sambar Cervus unicolor start giving alarm calls from a large shola (forest patch) in Turner's valley at the base of the west side of Poola Malai. A growl, apparently of a tiger, also is heard.
16.39h - The tiger is first seen bounding, then moving more slowly across the grassland flats at the base of the valley below the shola. It is following a sambar doe, which is moving up the base of Turner's Valley, about 250m ahead. The sambar doe has a wound on her right hind leg, a large chunk of tissue hanging free, although it does not appear bloody. She continues up the valley, and then turns uphill to enter another shola about 800 m from the first at 16.45. The tiger also continues up the valley, swimming through one pool in the stream, and then climbs on to the flats. Walking at a steady pace without hesitating, the tiger follows roughly the same path as taken by the sambar, although it is not obvious if it is following visual or olfactory cues.

16.50h - The tiger also enters the second shola.

16.58h - A series of sambar alarm calls come from the shola. Then 10-20 more at intervals of a few seconds.

16.59h - Having emerged from the side of the shola, the tiger again appears moving down the side of the valley, rounds a grassy ridge, and trots back into the first shola.

17.01h - After passing through the top of the shola, the tiger comes out onto the burned grassland above it.

17.02 - It is still apparently on the trail of the sambar doe whose movement I seem to have missed from my distant vantage point. The doe is now with several other sambar on the grassy slopes above and ahead of the tiger.

17.08h - Having apparently lost track of the wounded doe, the tiger doubles back, retraces her steps and disappears into the top of the shola.

17.16h - The tiger moans several more times. The doe has continued across and up the slope and moved from view.

17.33h - The tiger reappears at the top of the shola, sniffing the ground while moving. It climbs in switchbacks up the slope, now 50 m above. As the tiger comes into view the other sambar call. The tiger looks up at them and then doubles back up the valley as the sambar continue to stand and call, even after it moves out of sight.

17.41h - Tiger moans again. It is now just above the shola where it emerged earlier, apparently trying to relocate the wounded sambar's trail.

17.50h - The tiger starts up the slope again, galloping a few strides, then stands. It moves toward the other sambar, then turns back and forth.

17.54h - One of the sambar above sees the tiger and calls. The tiger zigzags around in the grasslands, giving a moan. Now about 100m apart and in plain view of each other the tiger and sambar stand facing each other. The sambar call, but not as persistently as earlier.

18.02h - The tiger seems to be searching the area for the wounded sambar's trail, moving back and forth.

18.06h - The tiger traverses the slope above the sambar and moves to ridge, stands, and the sits on its haunches.
18.09h - The tiger moves around the corner out of sight.

18.26h - Sambar alarm calls alert me to the tiger traversing back across the slopes. The tiger moans. The sambar take flight about 50m.

18.28h - The tiger moans again, diagonalling down across the slope. Six more moans by 18.34h. I lose track of it in the fading light, but moans are still heard until 18.56h.

Dr Rice comments: "This would appear to be a rare instance of an extended pursuit by a tiger, much in contrast to the quick and efficient hunting and killing usually attributed to them... Most accounts of killing are of tethered domestic buffalo baits and are of little use for comparison here. Nevertheless, it does illustrate that a tiger may pursue its prey far some distance, covering more than 2km in over 2h in this case. The wound was presumably inflicted at the initial attack, and was likely an important stimulus for the continuation of the pursuit. The tiger was probably using its sense of smell when following the sambar doe up the floor of the valley, and certainly seemed to be searching for a scent trail when zig-zagging on the slopes above the shola. Likewise it does not seem likely that the tiger could have kept on the trail of the sambar through so much grassland and forest without being able to follow the scent trail. This indicates, as Schaller has reasoned, that tiger's sense of smell is fairly good."

Dr Rice also observed leopards attacking tahr, and notes that surprise appeared to be essential. When tahr were aware of a leopard's presence it had little chance of a kill, although the tahr did not flee.

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EATING TIGERS IN TAIWAN

Asiaweek magazine's cover for 8 March portrayed the slaughter of a tiger in Taiwan to make stew, with more pictures inside of a tiger pinned in a cage and of other animals doomed to be killed and eaten.

In an editorial ASIAWEEK said: "The Cantonese like to say they eat everything with four legs except table and chairs, everything with wings except an aeroplane. Game dishes are especially popular, prized both for their exotic taste and reputed health-giving properties. That some wildlife are endangered species protected by law does not mean that they are safe from the dinner table."

The magazine said its reporter discovered a "bustling trade" in snakes, civets, wild boar, cats, partridge, wild duck, turtles and more in markets in Canton and Shenzhen, the free trade zone across the border in China. Animals on display were legal, but despite strict laws against the sale of endangered species, dealers were offering tiger, leopard, owl and pangolin. There were even special tours from Hong Kong to China's Guanxi Autonomous Region to dine on wildlife.

Many of the black market dealers came from Bolu, a mountainous region 116 km from Shenzhen, but the pipeline stretched all the way to China's borders with Burma and Vietnam. A Burmese tiger had been secretly transported to Guangxi and kept caged at a farmer's house. The selling price was HK$10,000 (US$1,280).
ASIAWEEK said large cats were usually transported in wooden boxes. One dealer had said he could arrange to send live tigers or leopards to Sheung Shui in Hong Kong's New Territories, where they could be picked up.

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MANEATING LIONS IN TANZANIA

Lions crossing into Tanzania from Mozambique have killed 30 people in Tunduru District in one year, according to Tanzania's Sunday News of 29 March.

The newspaper carried a picture of a male lion, which had reportedly killed 22 people in Mozambique before crossing to Mtwarar Rural District of Tanzania, where it killed three people, injured two others and ate 17 goats before being shot.

One lion ate the Tunduru District Game Warden in the town, according to the DAILY NEWS, and later attacked a Game Scout who was tracking it.

One official was quoted as attributing the lion attacks to poaching which had starved the lions of game. People were killing wildlife because of the lack of cattle and other domestic animals in the region.

The reporter who visited Tunduru said most residents, educated and "down-to-earth peasants", agreed that there were some witches and nature doctors ready to invoke evil in the form of lions. He said one man who had a grudge against a neighbour was said to have consulted a medicine man in Mozambique, who gave him a rope which could be turned into a lion if he followed strict instructions. The man lost the prescription and was eaten by the lion. The lion was now hungry and with no keeper had begun to eat other human beings.

The reporter concluded, "It is now exactly a year since Tunduru residents, peasants and workers, were promised a new wind of change of making their district safe against the marauding lions. But so far it is all wind and no change. Another human being was eaten earlier this month."

Another newspaper, the Daily News, reported on 29 July that game scouts deployed to deal with the maneaters complained of lack of ammunition and inadequate funds. They had suggested that the government should launch a special campaign involving the armed forces to solve the problem.

A local superstition had it that the lions had been sent by bad people to punish some officers in the natural resources department in the district, who were said to have harassed illegal hunters and fishermen. There were tales of lions scratching and knocking at doors, or pulling off roofs, while others spent the night in homestead compounds looking for victims.

Marcus Borner of the Frankfurt Zoological Society's Tanzania Wildlife Conservation Project says that two of the original three maneaters have been shot. The Serengeti Research Institute had sent tapes of noises of hyenas on a kill to attract the lions, but they were only partly successful, although the lions came the next day. It is suspected that the lions may have acquired a taste for human flesh from eating people killed in Mozambique's bush war. The Project Director of the Selous Game Reserve reported very little game in the area where the lions live. He saw only a few hartebeeste during an aerial survey, and said poaching of the few remaining wild animals was high.
AFRICAN AND ASIATIC LIONS LINKED

African and Asian lions shared a common ancestor between 50,000 and 200,000 years ago, according to Stephen J. O'Brien, of the US National Cancer Institute, and a group of specialists.

The following is the abstract of a paper published in NATURAL GEOGRAPHIC RESEARCH 3(1), 1987:

"Electrophoretic variation of 45 to 50 allozyme loci were typed in four African and one Asian (Indian) lion populations. The African population revealed moderate amounts of genetic variation compared with other cat species. The lions from the Ngorongoro Crater, a small isolated 'island population' within the Serengeti ecosystem in Tanzania, had a reduced level of variability, which was a precise subset of the larger founder population of the Serengeti plains. The Asiatic lion population from the Gir Forest in western India is a relict population of less than 250 individuals, which descended from a much more widely distributed subspecies early in the 19th century. The Gir lions were genetically monomorphic at each of 46 typed loci, suggesting a drastic population bottleneck followed by inbreeding in their recent history. The allozyme genetic distance estimates between African lion populations and between Asian and African subspecies were low and comparable with the distance values between conspecific mouse populations or between human racial groups. These results suggest that the two subspecies shared a common ancestor recently, estimated at between 50,000 and 200,000 years before the present."

STATISTICAL ANALYSIS OF ASIAN LION CENSUS

In CATNEWS 5 p.36 a report on the census of Asiatic lions in the Gir Forest, India, was reproduced from HORNBILL, a publication of the Bombay Natural History Society. A recent issue carried the following statistical analysis of the census:

On the probable error in a census on wartholes.

In a recent issue of Hornbill (1985, No. 4), the Editorial began thus: "Wildlife conservation in India, and perhaps elsewhere in the world also, is halting by numbers. How many? is the crucial question that is being asked." The editorial concludes: "It is best to consider all census figures as showing only a trend and not to accept any absolute figure." While this dictum is very appropriate, it would also be useful to develop some quantitative measure of degree of error in reported census figures.

The same issue of Hornbill (pp. 24-28) reports findings of a Lion census on wartholes carried out in the Gir in Gujarat State during May 1985. The procedure adopted is described as follows: "On each warthole three persons were posted to keep a vigil of the visit of animals round the clock for 24 hours. It was expected that all the animals would be visiting (one only one warthole) at once during the period of 24 hours. The result of the count is 239 lions. Unfortunately no measure of reliability of this figure is provided so that while some are very pleased with this number, others are quite sceptical.

Statistical analysis can sometimes yield a somewhat objective assessment of error in these numbers. This assessment is based on certain mathematical model implicit in the analysis. We shall briefly touch upon some very simple models, and point out their implications.

1. Model implicit in the census report: It is assumed that each lion visits the warthole (let us assume there is only one, the multiplicity does not affect the discussion) at least once. This implies that some lions may visit the hole more than once and hence will get counted more than once. Thus by their own reckoning the forest department figure of 239 is an over-estimate. If N is the true number of lions and V is the average number of visits per lion, then the warthole count is N V. Therefore a correct estimate of N is the warthole count (239) divided by V. If V is 2, the revised estimate will be only 119.

2. Alternative model: However, in all such plans of the census, perhaps some lions do not visit a warthole at all on the day of study, thus deflating the count. Suppose the proportion of days on which a lion visits a warthole (once only) is p and does not visit at all for the remaining 1 – p. Then on an average the warthole count is N p, and hence a good estimate of N is the count 239 divided by p. If p is 0.90, the revised estimate is about 265.

3. A combination model: Perhaps it is prudent to allow for both possibilities Suppose some lions visit the warthole exactly once on the census day (say with probability p), some lions visit exactly twice (with probability p²) and remaining lions don’t visit the warthole that day (probability p = 1 – p = p³). We could take into account the more remote possibility of 3 or more visits. This does not affect the conclusions materially.

Under this model it can be shown that on an average the warthole count will be N(p + 2p²) or equivalently 2N(1 + p – p³). The discrepancy (or bias to use a statistical term) is N p². Clearly if p is too small, the bias will be negligible. If p is too large, the bias may be relatively serious. Another pertinent question is the standard error of the warthole count. (Roughly, higher standard error reflects lower reproducibility of the estimate.) It can be shown that in the worst case the standard error of the warthole count is N (This happens when p = 1/2 and p = 0). An estimate of this worst case standard error is 2.39 (i.e. 1.54 for the problem on hand) and hence a confidence interval for the true number of lions is given by 239 ± 40. If this order of error is acceptable then the method in use should be considered adequate; otherwise it is not.

In conclusion we would like to propose that it is crucial to have some idea of the probabilities p, p, and p (not measured in the Gujarat study). If these are estimated then the appropriate estimator of the number of lions N will be the warthole count, C, divided by V (i.e. V p²). The approximate 95% confidence bound for N will then be given by 8.

As a numerical example, if the count is 239 and estimates of p, p, and p are 0.05, 0.80 and 0.15 then the approximate estimate of N is 217 and the 95% confidence interval for N is 200 to 234. Notice that even the upper bound of the confidence interval is smaller than the actual count.

S. KUMTE
A.P. Gore
Department of Statistics, University of Poona, Pune - 411007."
SNOW LEOPARD SURVEYS IN NEPAL

Rodney Jackson and Gary Ahlborn of the California Institute of Environmental Studies unexpectedly found snow leopard sign in Nepal's Sagarmatha (Everest) National Park during surveys last winter.

But in the Hongu valley to the east, where snow leopard were thought to exist, no sign was found.

Jackson and Ahlborn carried out surveys at the request of the Woodlands Mountain Institute, which is sponsoring a "Heart of the Himalayas Conservation Programme" aimed at protecting some 800,000 ha in the Everest region. The information was urgently needed for the Nepalese Government's consideration of more than doubling the size of the Sagarmatha National Park and for planning in the contiguous Tibetan area of China.

Jackson reports:

"We found no sign of snow leopard in the Hongu, which many thought would be a stronghold for the species, and probable cat sign in the Gokyo area of the Sagarmatha National Park, where the species was thought to have been extirpated over 10 years ago.

"Since potentially suitable habitat exists in both areas, the difference seems to be explained primarily by prey species, their abundance and availability. The Hongu lacks any large ungulates, except domestic sheep that invade the area in thousands for a brief period each summer. Vigilant shepherds almost guarantee that no cat could survive in the area for long, especially as it would have to subsist off livestock. By contrast, numbers of Himalayan tahr Hemitragus jemlahicus and musk deer Moschus moschiferus have increased dramatically within the boundaries of the Sagarmatha National Park following its establishment in the early 1970s. We do not think livestock predation problems (due to snow leopard at least) will arise as long as domestic livestock are dominated by yaks, which are used as beasts of burden for the growing trekking business conducted by the Sherpas who are residents of the Park. Goats and non-Tibetan breeds of sheep have been banned by the authorities, who feel that much of the range deterioration is due to these species.

"We have suggested two ways by which His Majesty's Government could improve the alpine grasslands of the upper Hongu Valley, which could constitute suitable range for tahr, as well as a few snow leopards or wolves Canis lupus. Firstly, the habitat could be enhanced through the reduction and eventual elimination of livestock, which currently heavily utilize the roughly 25 km² of productive grassland. The sheep grazing is apparently being conducted by only a few Gurung families who have leased the rangelands from Rai owners, who, in turn, live at the downstream end of the impassable gorge. The lease will be up for renewal soon. It should be relatively inexpensive to purchase.

"Secondly, we have recommended that the park boundaries be slightly modified to better encompass populations of tahr living along the lower Hongu gorge, which is not occupied by humans. In time we would expect them to move upward and inhabit the alpine zone, thus providing a year-round food source for large carnivores like wolf and snow leopard. We suspect that snow leopard
will eventually enter this remote valley from existing populations in the Rolwaling or Thame areas to the northwest, or from across the border in Tibet."

CLOUDED LEOPARD STUDY

Alan Rabinowitz of the New York Zoological Society has begun a two-year study of clouded leopard in Thailand. He has established a field station in the Huay Kha Khaeng Wildlife Sanctuary adjoining the Burmese border.

Rabinowitz, whose jaguar studies in Belize led to the establishment of the world's first jaguar reserve in the Coxcomb Basin, chose his clouded leopard research area after surveys in Sabah and Sarawak in northern Borneo and Taiwan. Among his conclusions from these preliminary surveys was that the clouded leopard was not an arboreal cat in the true sense of the word, and most likely used trees primarily as a resting site. He said the clouded leopard still appeared to inhabit many areas in Sabah and Sarawak and seemed to be in no immediate danger of extinction. On the other hand, in Taiwan the only recent evidence of the cat was in two remote, isolated areas of the Central Mountain Range - the Yushan National Park and a provincial forest in the Tawu Mountains. Rabinowitz stressed that habitat protection was paramount if the cat was to survive, along with prevention of the poaching of potential prey species. He recommended more detailed surveys and the development of a plan to upgrade the area in the Tawu Mountains to a wildlife sanctuary. Last February he conducted a class and workshop to teach wildlife survey techniques to Taiwanese officials and researchers so that they could census clouded leopard populations.

CHINESE RESTAURANT FINED FOR TRADING IN CLOUDED LEOPARDS

The Xinghua Wildlife Restaurant in Huizhou, 150 km east of Guangzhou (Canton), and several people were fined recently for trading in clouded leopards, according to the newspaper Yangcheng Wan Bao of Guangzhou of 13 April 1987.

Tan Bangjie quotes the newspaper as saying that in January 1986 the restaurant owner bought a clouded leopard from a farmer in Zijin County, about 100 km northeast of Huizhou for 1,000 Yuan ($270) and sold it for a profit to the Shangrila Hotel, where it died after being displayed for six months outside the hotel. The restaurant owner bought another clouded leopard for the same price in January 1987 and killed it for meat. Fines were imposed on the restaurant, the hotel, and the farmers who had supplied the cats.

PLEA FOR THE PYRENIAN LYNX

The lynx of the Pyrenees in France and Spain, which appear to survive in a relict micro-population, are probably descendants of the Pleistocene cave lynx and deserve special protection from interbreeding with introduced lynx, according to Professor Dr Helmut Hemmer.

Commenting in a letter on a draft data sheet on the Eurasian lynx, Dr Hemmer disagreed with the draft's basis that the geographic populations of lynx in Eurasia could be divided into only one or two subspecies. He said that the species showed a clear differentiation that might help understanding of evolutionary processes in other large mammals during the Pleistocene. He said that the extinct Alpine lynx (not the introduced species) had clearly evolved from the cave lynx of the Pleistocene, and that the Pyrenian lynx was also a member of this clade, somewhere between F. lynx and F. pardin.
"There are good indications that the former Alpine lynx (not the introduced one) represented clearly its own clade that derived from the cave lynx of the Pleistocene. It must be supposed that the Pyrenesian lynx is also a member of this clade (somewhere between Felis lynx and F. pardina). So far as I can see there are reports of this animal surviving in relict micro-populations. If these Pyrenean lynx were mixed with any introduced F. lynx lynx we should be finishing off the last cave lynx in the name of nature conservation."

CALIFORNIA'S MOUNTAIN LIONS TO BE HUNTED AGAIN

After a 15-year break mountain lions Felis concolor can again be hunted in California. The State Fish and Game Commission has lifted a ban, and set a hunting quota of up to 190.

Two children were attacked by mountain lions last year in Caspers Wilderness Park in Orange Country last year, leading to calls for lifting the hunting ban. But a State wildlife official, Terry Mansfield, said that black bear and deer were responsible for more attacks on people.

Mansfield said surveys indicated more than the estimated 1,000 mountain lions in California, but there was no cause for alarm. Some press reports have claimed there are 5,000 in the State, but Joe Maynard of the Exotic Feline Breeding Compound, Rosamund, puts the maximum number at less than 3,000, probably many fewer, living in fragmented range.

CITES PROTECTION FOR NORTH AND CENTRAL AMERICAN JAGUARUNDI

The CITES Conference of the Parties in Ottawa in July unanimously agreed to substitute Felis yaguarundi "populations of North and Central America" in place of the subspecies cacomitli, fossata, panamensis and tolteca in Appendix I of the convention, which bans international commerce.

The change was proposed by Switzerland on the ground that the original intention of the Plenipotentiary Conference in Washington in 1973 had been to fully protect the North and Central American populations of jaguarundi by placing them in Appendix I. Since many authors felt that these subspecies were not valid, and because it was known that the jaguarundi shows an enormous individual variation with different colour phases, from foxy red to black, occurring in the same litter, it seemed preferable to replace the four subspecies by a geographically defined population.

CATS IN SAUDI ARABIA

Any visitor to Jeddah in Saudi Arabia will be impressed by the number of feral cats swarming around garbage areas. Unfortunately, except for the wild cat Felis sylvestris, all the other Felidae in the country are very rare and threatened.

The FAUNA OF SAUDI ARABIA Vol. 7, Carnivora, published in 1985 (edited by J. Gasperetti, D.L Harrison and W. Buettiker) contains the following information:
WILDCAT *Felis sylvestris*

Distribution is widespread in Arabia. They mingle with domestic cats and hybrid specimens are common. It is often difficult to distinguish pure wildcats from similar looking domestic cats in the field. It is desirable to investigate the impact of feral cats on birds, reptiles and small mammals and determines measures for their control.

SANDCAT *Felis margarita*

Probably more widespread than collection records indicate. Their known habitat in Arabia, which indicates that they live without any source of water, coincides with that of sand skinks *Scincus* spp. and the Arabian toadheaded lizard *Phrynocephalus arabicus*, which probably contribute greatly to their food requirements of the order of 0.25 kg per day. The sandcat is susceptible to baiting and trapping.

CARACAL *Felis caracal*

Not common but widespread in Arabia. Caracal are easily baited and trapped, making their continued existence precarious at best. Large and well-managed protected areas need to be established to assure the longterm survival.

LEOPARD *Panthera pardus*

Probably now confined to the southeastern Asir, the remoter mountains of South Yemen and the mountainous Ras Musandam in Oman, due to shooting and poisoning. The leopard needs urgent protection if it is to be saved from extinction. At the time of writing extermination is imminent for several reasons. Leopard are shot, poisoned and snared. They are also tracked to their lairs, walled in with stones and cement and starved to death. The skins are usually sold in the markets of Asir towns for a paltry sum. Large and well-managed protected areas are required to assure its survival. It would be worth considering compensation of herdsmen and farmers for animals lost to leopard predation. Game wardens should be trained to prevent killing and molestation of leopard.

CHEETAH *Acinonyx jubatus*

Probably once more widespread in Arabia than records indicate. It is hoped that in some corner of the vast deserts the cheetah is still extant.

**SPANISH AIRFORCE MAY BOMB MAJOR WILDLIFE AREA**

The estate of Caba/eros in the Toledo Mountains of central Spain, home of Spanish lynx *Felis lynx pardina*, wildcat *F. sylvestris* and many birds of prey which are now very rare in western Europe, has been chosen by the Spanish Government as an airforce training area.

The Federacion Coordinadora para la Defensa de las Aves (CODA) describes the 24,000 ha estate as the biggest wild Mediterranean forest left in the world, containing 13% of the surviving European breeding population of the black vulture *Gyps monachus*. It is one of the last strongholds of the lynx, whose population has been gravely depleted and fragmented.
CODA declares that military training in Caba/eros would violate the international Covenant of Berne, which was signed by Spain in 1986, the European Community Bird Directive and the Spanish Law of Protected Species.

In response to CODA’s call for a mailing campaign to save Caba/eros I addressed letters to H.M. King Juan Carlos, Prime Minister Felipe Gonzalez and Defence Minister Narcis Serra on behalf of the Cat Specialist Group, and contributed $50 to CODA’s campaign budget.

CAT SKINS DETAINED IN SPAIN

A shipment of 5,000 cat skins, which arrived at Bilbao, Spain, from Hamburg, Germany, was detained by customs at Madrid because of supposed illegality. The skins had been refused entry by Germany.

TRAFFIC BULLETIN, which quoted DIARIO 16 of 19 March 1987, said the unique aspect of the case was that the skins - of little spotted cat Felis tigrina and Geoffroy’s cat F. geoffroyi - had been travelling through European customs since 1982, the year they left Paraguay.

The shipment has been held in Madrid awaiting an export permit from the country of origin. However, Paraguay banned exports of wildlife in 1975.

The skins were allegedly bought for seven million pesetas (US$55,000) by a Spaniard.

CAT GROUP POLICY ON TROPHY HUNTING

In CATNEWS 6 I invited comments on a suggested draft for a Cat Group policy on trophy hunting, an issue which is very much to the fore. The draft said:

1. Trophy hunting is a legitimate use of wildlife, provided:

1.1. that the target species is not threatened either locally or overall;

1.2. that the controlling authorities have proven ability to manage the wildlife resource;

1.3. that a substantial portion of the income should be channelled to conservation and for the benefit of local people without reduction of the normal budget allocations for those activities.

2. Each trophy hunting proposal should be considered separately in the light of the above conditions.

Professor Dr. Paul Leyhausen

"I am not of the opinion that trophy hunting should be regarded as 'a legitimate use of wildlife' by IUCN, least of all by the Cat Group. Even with animals of relatively high population density like most herbivores, trophy hunting must of necessity in the long run exert a negative selection pressure. The trophy hunter very naturally seeks the best, the biggest, the
most phenomenal antlers, horns, pelts etc. Thus mortality caused by trophy hunting takes a disproportionately high toll of the best, and inevitably will result in a deterioration of stock quality. In an animal like a big cat, whose density is low even in undisturbed populations, this effect will be more pronounced and quicker to become manifest. If control should ever be necessary, it should be exerted along the principles of indiscriminate elimination of surplus. If indeed we want conservation we must be careful not to deflect natural selection. In a declining species — and the leopard is a declining species, even where it is still relatively frequent, even according to Norman Myers — trophy hunting must be resisted to the last stand, especially by the Cat Group. Experience has shown that when you don't or won't withstand the beginnings you will never be able to stem the tide later. Under no conditions whatsoever condone trophy hunting of cats!"

Dr Brian Bertram

Below is a suggested redraft of the policy on trophy hunting.

1. Trophy hunting of cats can be a legitimate use of wildlife. For it to be considered desirable in any particular situation the minimum requirements are:

1.1. that killing is carried out humanely;

1.2. that the target species is not threatened either locally or overall, either directly or by facilitating uncontrolled killing elsewhere;

1.3. that the controlling authorities have demonstrable ability to manage the wildlife resource properly;

1.4. that it should result in a significant increase in the amount of money channelled towards conservation and for the benefit of local people.

Mr Arjan Singh

"So-called sport hunting, apart from the moralistic view that it is uncivilised to take pleasure in taking life of another entity in creation, is also anachronistic because of the alarming shrinkage of wild populations. It is now a form of legalized poaching, and the declared inability to eradicate poaching smacks of the adage that if you can't beat them, join them. Pompous statements regarding 'sport culling' and 'sustained yield' are easy ways of justifying such slaughter, and in the present context of reduced and degraded habitat areas, even a local deficit may be converted into a surplus area by an immoral reduction of habitat. Wildlife must still be expected to pay for its own salvation.

"Sport killing must be outlawed in tandem with the concomitant occupation of commercial poaching. The difference is strictly marginal, and the slender revenues are tainted. The argument that legalized hunters keep out poachers is another talking point by which false theories are propagated, as they operate under different mandates. What is correct is that sport hunters do harm by legalized killing of prime breeding stock, and illegal operators can often take shelter behind their activities. If killing is made illegal, it will go a long way toward depressing occupations which are essentially immoral — one for commercializing a living resource and the other for taking a vandal's pleasure in destruction."
Dr Louise Emmons

Dr Louise Emmons, who has extensive experience in Latin America, opposed any hunting of jaguar for the following reasons:

1. It is currently impossible to evaluate and accurately monitor populations;

2. Although jaguar occur widely, populations appear low;

3. These populations are threatened by subsistence hunting and deforestation;

4. Hunting jaguar in rainforest entails the slaughter of other threatened species;

5. There is no mechanism to correctly control a limited take.

"In the completely rainforested regions where I have worked, virtually all ex-jaguar hunters say they hunted with box traps baited preferentially with monkeys, or as second choice peccary or deer. Because the return per trap is low, many monkeys and other game were shot for every jaguar and ocelot caught. Monkey and peccary populations over vast areas have already been decimated by hunting. Reopening hunting of felids in rainforest regions would add severe and unsustainable pressure to remaining monkey populations. In drier habitats, where dogs are used, these can be so efficient at finding jaguar that entire populations can be quickly reduced below acceptable levels for sustained management."

ROARING AND SCREAMING BIG CATS

The roaring cats of the genus Panthera are distinguished by an elastic ligament in their hyoid bones. This accounts for their deep voices, but does not account for their roaring, according to Malcolm Hast, Professor of Otolaryngology at Northwestern University School of Medicine, Chicago. According to a report in the New Scientist of 19 February 1987, Hast dissected the larynges of 12 species of cat and found that real roarsers had very large undivided vocal cords with a large pad of fibroelastic tissue at one end. Thus the tube was like a trumpet, allowing sound to pass from high to low air resistance with a better transfer of acoustic energy resulting in a booming roar.

The only cat in the genus Panthera without this structure is the snow leopard P.t. uncia, which screams, and Hast suggests this should make it a separate genus Uncia.

MILLIONS AND MILLIONS OF CATS

There are 400 million domestic cats in the world, according to a report by the French Academy of Sciences quoted by the New Scientist of 2 April 1987. The USA heads the list with 55 million, with Indonesia second with 30 million - but in each country there are five humans per cat. Britain has 5.3 million cats with 20 per km², a much lower density than Madeira with 100 cats per km² or Israel with 50. Gabon, Guyana, Burkina Faso, the Central African Republic and Peru were said to have no cats at all.
CATS OF THE WORLD: BIOLOGY, CONSERVATION AND MANAGEMENT

The gestation period is probably a record, but at last the offspring of the International Cat Symposium held 4-6 October 1982 on the campus of Texas A&M University in Kingsville, Texas, has been born. CATS OF THE WORLD, the Proceedings of the symposium, is now available and will be an invaluable reference work from now on. Many of the leading world experts on cats contributed to the symposium with papers on the status, social interactions and behaviour, reproductive behaviour/population dynamics, predator/prey interactions and resource use, and conservation strategies.

It is perhaps illustrative of the problems faced by editors of proceedings that several important papers are represented only by abstracts, the authors having presumably failed, as novelist Trollope described the art of writing, to "apply the seat of the pants to the seat of the chair." This is a pity, for one would have liked to see their contributions fully recorded. Perhaps the Editors had them in mind when they wrote in the Introduction: "Research and public dissemination of research results to public administrators and to the public at large is crucial." Incidentally, I could not help noticing that the guilty parties included three members of the Cat Group.

The section on the status of the cats ranges through important areas of Asia, but India is a notable omission. This is surprising, given that Project Tiger, launched in 1973, has been one of the most publicised of all wildlife conservation projects, and information about the area's 15 felid species - the highest number of any country in the world - although scanty, is better than that from most of the rest of the world. Only Kenya, Uganda and Botswana represent the African continent, from which it would have been desirable to have something from Zimbabwe and South Africa as well in view of the advanced state of research and knowledge in those two countries, not to mention Equatorial and West Africa. The only Latin American country covered in the volume is Venezuela, which reflects the paucity of knowledge of the neotropical cats in the continent. Happily, since the symposium was held the flow of information has improved to some extent.

In terms of biology and behaviour there is a heavy bias towards North American species, notably the bobcat. This is undoubtedly because of the location of the symposium, as well as the fact that more work has been done in the area. But one hopes the next symposium on cats will redress the balance.


TIGERS OF THE WORLD

The proceedings of the symposium on tiger at Minneaplis-St Paul in April 1986 will be available soon.

TIGERS OF THE WORLD: THE BIOLOGY, BIOPOLITICS, MANAGEMENT AND CONSERVATION OF AN ENDANGERED SPECIES

Ed. Ronald L. Tilson and Ulysses S. Seal

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Artois, Dr Marc, Centre National d'Etude sur la Rage, Domaine de Pixerecourt, B. P. No. 9, 54220 Malzeville, FRANCE, (0033) 16 (8) 329 2608. Eur. Wildcat.
Baude, Dr Robert E., Rare Feline Breeding Centre, P.O. Box 100, Center Hill, Florida 33514, USA. (001) (904) 793 2109. WAf SAm SEAs WEur. Clouded leopard, marbled cat, tiger, leopard, captive breeding.
Belden, Dr Robert, Florida Panther Recovery, Florida Game and Wildlife Commission, 4005 South Main Street, Gainesville, Florida 32601, USA, T:(001) (904) 376 6481. NAm. Florida panther.
Bertram, Dr Brian, Zoological Society of London, Regent's Park, London NW1 4RY, UK. T: (00 44) (01) 722 3333. EAf. Lion, leopard, cheetah. Captive breeding.
Biswas, Dr Biswanoy, c/o Zoological Survey of India, Indian Museum, 27 J. L. Nehru Road, Calcutta 700 016, INDIA. T: (0091) 33 23 2562. SAs. South Asian felids.
Blopervist, Dr Leif, Helsinki Zoo, 00570 Helsinki 57, FINLAND. T:(0035) (90) 170 07. CAs. Snow leopard (studbook keeper).
Bolshova, Mrs Lydia, Admin. of Nature Conservation Reserves, State Agro-Industrial Committee, Orliski per.1/11, 107139 Moscow, USSR, 207 6706.
Breitenmoser, Dr Urs, Ebnit, 3780 Gstaad, SWITZERLAND, (030) 41423. Eur. Lynx.
Brockelman, Dr Warren Y., Faculty of Science, Mahidol University, Rama VI Road, Bangkok 4, THAILAND. SEAs. Felids. Trade Cravshaw, Mr Peter G., 118 Newins Ziegler Hall, Univ. of Florida, Gainesville FL 32611, USA. SAm. Jaguar, ocelot, margay.
Dolbes, Dr Miguel, Estacion Biologica de Donana, Pabellon del Peru, Avenida de Maria Luisa s/n, 41013 Seville, SPAIN. T:(0034) (954) 23240. WEur. Iberian lynx. Captive breeding.
Eisenberg, Dr John F., Dept of Natural Sciences, The Florida State Museum, University of Florida, Gainesville FL 32611, USA, (001) (904) 392 1721. NAm SAm. Jaguar puma.
Foote, Dr Tom, AZAFA Conservation Coordinator, ISIS Office, Minnesota Zoological Garden, Apple Valley MN 55124, USA. T:(001) (304) 242 2160. Captive breeding.
Fox, Dr Joseph, c/o International Snow Leopard Trust, 16463 Southeast Thiryfifth St. Bellevue, Washington 98008, USA. SAs. Snow lpd.
Frame, Dr George, c/o Clark Lungren, Ass. de Developement de l'Elevage de la, Faune, B.P. 5570, Ouagadougou, Burkina Faso. T1x: 1112 bctr bf. Lion, leopard, cheetah.
Freeman, Mrs Helen, President, International Snow Leopard Trust, 16463 Southeast Thirtyfifth St., Bellevue, Washington 98008, USA. T:(206) 746 8743. Seattle Zoo (206) 4550. Snow lpd.
Garzon, Mr Jesus, Saltos de Torrejon. Plasencia (Caceres), SPAIN. WEur Spanish lynx.
Geertsema, Ms Aadje, Praamgracht 3, 3761 LA Soesdijk, NETHERLANDS. T: (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. T: (0049) 6136 42424. NAF SAs. Barbary lion, sand cat. Captive breeding.
Hoogesteijn, Dr Rafael, Apartado 3083, El Trigal, Valencia, Edo. Carabobo, VENEZUELA. SAm. Jaguar ocelot, jaguarundi, puma

Hornocker, Dr Maurice, Unit Leader, Idaho Cooperative Wildlife Research Unit, University of Idaho, Moscow Idaho 83843, USA. T: (001) (208) 855 7975. NAm SAm. American felids.

Jackson, Mr Peter, Haut Verger, Route des Macherettes. 1171 Bougy-Villars, SWITZERLAND. T: (0041) (021) 76 60 12. SAS. Tiger, Asiatic lion.

Jackson, Mr Rodney, California Institute of Environmental St, 910 E. Street, Davis CA 95616, USA. T: (001) (916) 756 1175; Res : (415) 381 922, SAS. Snow leopard.

Johnson, Dr Kurt A, Dept of Animal Ecology, 124 Scienecs II, Iowa State University, Ames Iowa 50011, USA. NAm SAm. Puma.

Joslin, Dr Paul, Chicago Zoological Park, Brookfield Illinois 60513, USA. T: (001) (312) 485 0263. SAS SWAS. Asiatic lion, cheetah, Caspian tiger.

Karanth, Mr K. Ullas, Centre for Wildlife Studies, 499 Kuvempu Nagar, Mysore 570 023, INDIA. SAS. Tiger leopard.

Khan, Mr Mohd Khan bin Momin, Director General, Wildlife and National Parks Dept, Block 19 Jalan Duta, Kuala Lumpur, MALAYSIA. T: (0060) 3 941466/94 1110. SEAS. Felids.

Khan, Dr M. A. Reza, Curator of Birds, Al-Ain Zoo and Aquarium, P.O. Box 1204, AL AIN, Abu Dhabi, United Arab Emirates. T: (0097) 12 828 488/res. 828 4540. 34008 balida em. SAS Was.

Konecny, Dr Michael, Dept of Zoology, University of Florida, Gainesville FL 32611, USA. T: (904) 392 1107. CAM. Felids.

Lewis, Mr John, Director, John Ball Zoological Gardens, 201 Market St. SW, Grand Rapids MI 49503, USA. T: (001) (616) 776 2591. EAs SEAS. Clouded leopard (Studbock kpr)

Leyhausen, Prof. Dr Paul, Auf'm Driesch. D-5227 Windeck l/Halsaedt, FEDERAL REPUBLIC OF GERMANY. T: (0049) (02292) 1641. EAf EQPh SAS SEAS. Taxonomy, Behaviour.

Houji, Dr Lu, Department of Biology, Animal Ecology Research Group, East China Normal University, Shanghai 2000062, CHINA. EAs. Chinese felids.

MacDougal, Dr Charles, Tiger Tops, P.O. Box 242, Kathmandu, NEPAL. T: (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. T: (001) (513) 281 4701. Captive breeding. Tropical felids.

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

Mendelssohn, Prof. Dr Heinrich, University of Tel Aviv, Faculty of Life Sciences, P.O. Box 39040, Ramat Aviv 69978, Tel Aviv, ISRAEL. T: (0097) 23 (03) 420812. SWAS. Leopard, jungle cat, caracal, wildcat.

Miller, Dr S. Douglas, Vice-President, Wildlife Research, National Wildlife Federation, 1412 Sixteenth Street NW, Washington DC 20036, USA. T: (001) (202) 797 6800. NAm SAm. Bobcat, lynx, puma, ocelot.

Mishra, Dr Hemanta R., Secretary, King Mahendra Trust, Babar Mahal, P.O. Box 3712, Kathmandu, NEPAL. T: (0097) 215850/215912, NP2203, SAS Felids.

Morsbach, Mr Dieter, Directorate of Nature Conservation, Private Bag 13306, Windhecek 9000, SW Africa. SWAf. Cheetah.

Navarro L., Mr Daniel, Centro Investigaciones, Apartado postal 886, Cancon Q.R., Quintana Roo, MEXICO. Cam. Ocelot.

Norton, Mr Peter M., Nature & Environmental Conservation Dept, Private Bag 5014, Stellenbosch 7600, SOUTH AFRICA. T: (0027) (02231) 70130. SAf. Leopard.
O'Brien, Dr Stephen J., Laboratory of Viral Carcinogenesis, National Cancer Research Institute, Bldg. 560, Room 11-85, Frederick MD 21701, USA. Feld 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 SFA.

Kalari lion, leopard, cheetah.

Packer, Dr Craig, Dept of Ecology and Behavioural Biology, 108 Zoology Building, 318 Church Street SE, Minneapolis MN 55455, USA. T: (612) 373 5177. EqAf. Lion.

Panwar, Mr Hemendra S., Director, Wildlife Institute of India, P.O. New Forest, Dehra Dun 248 006, INDIA. T: (0091) 27021, (081) 595258 pres in. Sas. Tiger, leopard.


Quigley, Mr Howard, Wildlife Research Institute, P.O. 3246, University Stn, Moscow Idaho 83843, USA. T: (208) 885 6871. SAm. Jaguar ocelot, puma, jaguarundi.

Rabinowitz, Dr Alan, Animal Research and Conservation Center New York Zoological Society, Bronx Zoo, Bronx NY 10460, USA. T: (1212)220 5155, (023) 428 279 NYZAKC. Cm. Jaguar.

Ranjitsinh, Dr M. K., Jt. Sec. (WL), Ministry of Environment, B2 B Block (4th Floor), CGO Complex, New Delhi 110 011, INDIA. T: (0091) 11 618028. 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. T: (0091) ( ) 58190. Sas. Asiatic lion, cheetah, leopard.

Rathore, Mr Fateh Singh, Field Director, Ranthambhor Tiger Reserve, Sawai Madhopur, Rajasthan, India. Sas. Tiger, leopard.

Ray, Mr Jaime R., Estacion Biologica de Donana, Apartado Postal 1056. Seville 41013, SPAIN. SAm.

Roberts, Mr Tom, Cae Gors, Rhoscenfnhir near Pentraeth, Anglesey LL75 8YU, UK. Sas. Pakistan felids.

Roelke, Dr Melody E, College of Veterinary Medicine, University of Florida, Box J-6 JHMHC, Gainesville, Fl 32610, USA. T: 904 392 2977. NAm. Florida panther.

Sankhala, Mr Kailash S., 21 Dulaheshwar Garden, Jaipur 302001, INDIA. T: (0091) ( ) 61958. Sas Tiger leopard, Indian felids.

Santiapillai, Dr Charles, WWF Indonesia Project, P.O. Box 133, Bogor, INDONESIA. SAs SEAs. Leopard.

Sanyal, Mr Pranabes, Assistant to Chief Conservator Forests, Forest Dept, Exchange Buildings, Calcutta, India. Sas. Tiger

Seal, Dr Ulysses S., Veterans Administration Hospital, 54th Street & 48th Avenue South, Minneapolis MN 55417, USA. T: (001) (612) 725 6767 extn 60 21, res. (61. Captive breeding. Tiger.

Seidensticker, Dr John C., National Zoological Park, Washington, DC 20008, USA. T: (001) (202) 483 1714. Sas SEAs. Tiger, leopard, captive breeding.

Seifert, Prof. Dr Siegfried, Dr Kurt Fischer Strasse 29, Zoologische Garten. 7010 Leipzig, DDR. T: (0037) 41 281235/52971. Captive breeding. Tiger (Studbook keeper).

Shoemaker, Mr Alan H., Riverbanks Zoological Park, 500 Wildlife Parkway, Columbia SC 29210, USA. T: (001) (803) 779 8717. Captive breeding. Leopard (Studbook keeper).

Singh, Mr Arjan, Tiger Haven, P.O. Pallia. 262 902 Kheri District, Uttar Pradesh, INDIA. Sas. Tiger, leopard.

Singh, Mr Ram Lazhan, Director, Project Tiger, Ministry of Environment, Bikaner House, New Delhi 110 011, INDIA. T: (0091) 11 364428, (081) 314497. Sas. Tiger.
Smith, Dr James L. David, Dept of Fisheries & Wildlife, 200 Hodson Hall, 1980
Folwell Ave, St Paul MN 55108, USA. T: (001) (612) 373 9904/3026 Res:
6992837. SAS Tiger leopard.

Stuart, Mr Chris, 7 Caledon St., Greyton 7233, SOUTH AFRICA. T: (02822)
9786. SAF. Carnivores

Sumardja, Drs Effendy, Directorate of National Parks and Recreation, 100 Jl.
Ir. H. Juando. Bogor 16123, INDONESIA. SEAs

Sungquist, Dr Melvin E., Dept of Natural Sciences, Florida State Museum,
University of Florida, Gainesville Fl 32611, USA. T: (001) (904) 392 1721.
SAM SAs. Tiger leopard, ocelot, jaguarundi.

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

Tan Bangjie, Prof., Beijing Zoo, Beijing, CHINA. EAS. Chinese felids.

Tello, Dr Jose Lobao, Box 1319, Maputo, Mozambique. SAF.

Tewes, Dr Michael, Director, Feline Research Centre, Texas A&I University,
Campus Box 218, Kingsville Texas 78363, USA. NAM. Ocelot, bobcat.

Thapar, Mr Valmik, 19 Kautilya Marg, New Delhi 110 021, INDIA. SAs. Tiger,
leopard

Tilson, Dr Ronald L., Curator of Research, Minnesota Zoological Garden, 12101
Johnny Cake Ridge Road, Apple Valley, Minn 55124, USA. T: (612) 432 9010.

Vaughan, Mr Chris, Escuela de Ciencias Ambientales, Universidad Nacional

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

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

Wilson, Mr Vivian J., Chipangali Wildlife Trust, P.O. Box 1057, Bulawayo,
ZIMBABWE. RFA EqAf SAF WAF. African felids. Captive breeding.

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

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

Xiang Feilun, Dr, Chongqing Zoo, Chongqing, CHINA. EAS. Captive breeding.
Tiger.

Xiao Qianzhu, Prof., Northeast China Forestry Institute, Harbin, CHINA. EAS.
Tiger. Chinese felids.

Yasuma, Dr Shigeki, WWF/Japan Scientific Committee, Nihonseisei Akabanebashi
Bldg (7F), 3-11-14 Shibya, Minato-ku, Tokyo 106, JAPAN. T: (0081) (03) 769
1711, (0720) 2428231 wfwjpn j. EAs. Iriomote cat.

Zhyvotchenko, Prof., V.I., Hunting and Hunting Science Magazine,
Sadovaya-Spasskaya 18, 107807 GSP Moscow B-53, USSR. T: 207 20 91. CAs EAs
EEur. Tiger, USSR felids.
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