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Cover: Clouded leopard Neofelis nebulosa, Khao Yai, National Park, Thailand
Photo: Sean Austin (see page 17)

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Editorial

Could the Lion go the way of the Tiger?

Visiting East Africa and southern Africa, you are sure to see lions. They are the centre of attraction. They are visible in so many places that it has seemed no need to worry about their future. Nevertheless, concern has grown among lion specialists because it is becoming clear that lions are heavily persecuted outside reserves by livestock owners, who either suffer, or fear they will suffer, from losses to lions. Habitat is being fragmented and legal hunting continues.

No one knows how many lions there are in sub-Saharan Africa. When Kristin Nowell and I were compiling our book, “Wild Cats: Status Survey and Conservation Action Plan” (IUCN 1996) we received “guesstimates” ranging from 30,000 to 100,000.

Out of the blue, Sarel van der Merwe, Curator of Bloemfontein Zoo in South Africa, wrote to me in January about his concern about lions. We contacted lion specialists, 18 of whom met in October at the time of the annual gathering of the Conservation Breeding Specialist Group (CBSG) in the South African resort of Warmbaths. A Lion Working Group was established and a far-reaching plan drafted to examine the situation throughout sub-Saharan Africa

With the guidance of David Wildt, a member of both the CBSG and the Cat Specialist Group, the working group identified the key issues concerning lions and agreed on the need for a continental survey. Priority will be given to collecting data on lion status in central and west Africa, where lion populations are feared to have become “Vulnerable”, an IUCN category of risk defined as “not Critically Endangered or Endangered, but facing a high risk of extinction in the wild in the medium-term future”.

The group envisages two formal meetings. The first will be a workshop to prepare a survey to determine lion status in central and west Africa, based on the initial data collection. This will be followed by a larger conference for detailed discussion of lion issues on a continental basis.

There is no suggestion that the African lion is currently in danger of extinction in the wild. But, in the early decades after World War II, few thought the tiger could face extinction. This was despite warnings from such eminent tiger specialists as Jim Corbett, who said in his famous book, “Maneaters of Kumaon”, published in 1944: “A tiger is a large-hearted gentleman with boundless courage and when he is exterminated – as exterminated he will be unless public opinion rallies to his support – India will be the poorer by having lost the finest of her fauna.”

The same threats suffered by the tiger face the lion. Just as the Caspian, Bali and Javan tigers have become extinct, the Cape lion of southern Africa disappeared a century ago, and, soon after, the Barbary lion, in the north of the continent followed suit. In the meantime, the last Asiatic lions were pulled back from the verge at the last minute. But only 300 survive now in a single reserve in India.

Like tigers, lions are suffering habitat loss as human population grows and requires more land for settlement and economic development. Isolated groups of lions could become vulnerable to the ills of inbreeding. Persecution by livestock owners is playing its part in the fragmentation and decimation of lion populations.

Fortunately, the lion has not become a target for bone traders supplying the illegal medicine market in Asia, but vigilance is needed to detect any such development.

Hunting, which became a major threat to the tiger as the population dwindled, may also affect some lion populations. The Lion Working Group has recommended high priority to working out ways to ensure that trophy hunting is conservation-oriented, including developing quotas that do not harm lion population viability. This is a challenge to the hunting community. Tiger hunting had to be banned because of the conservation crisis. Hunting organisations and individual hunters must now cooperate with conservationists to ensure the lion’s future.

This is an important moment in the history of wildlife conservation. The African lion is a symbol of wild Africa. Action to ensure its future survival is vital – now! 

Peter Jackson
Siberian Tigers on Brink of Extinction in China

by Sun Baogang1, Endi Zhang2 and Dale Miquelle2

An international team of specialists has concluded that the Siberian (Amur) tiger (Panthera tigris altaica) is on the verge of extinction in China. Surveys were conducted over two years to cover the two north-eastern provinces where Siberian tigers were thought to still occur in China. Results of the field survey, conducted by Chinese, Russians and Americans in Jilin Province in February and March of 1998 and again in January and February of 1999 in Heilongjiang Province suggested that at least four, and as many as six tigers may occur in Jilin Province, and no more than seven occur in Heilongjiang Province. Evidence for 4-7 Far Eastern leopards, one of the rarest of the large cats, was also found in Jilin Province. Other reports of tigers and leopards could not be corroborated.

The latest survey in Heilongjiang Province was sponsored by the Wildlife Conservation Society of New York. A 12-member team, led by Sun Baogang and Yu Xiaochen of the Wildlife Institute of Heilongjiang, Dimity G. Pikunov of the Russian Academy of Science's Institute of Geography, Vladivostok, Yuri Dusishenko of the All-Russia Institute of Hunting Management, and Endi Zhang and Dale Miquelle, of the Wildlife Conservation Society, found the situation particularly serious in Heilongjiang Province.

Results indicated that the majority of tigers were recorded close to the Russian border, indicating that most probably dispersed recently from adjacent habitat in Russia, where tigers are fairly abundant. Most distressing to biologists conducting the survey was the complete absence of any evidence indicating reproduction. There were indications of only a few isolated tigers scattered across a huge landscape, with the only evidence of young coming from unconfirmed reports from local people that there was at least one year-old cub. Without reproduction in China, the population is doomed to extinction.

One month was dedicated to searching the best remaining habitat adjacent to the Russian border, and conducting extensive interviews with local citizens. The absence of persistent, repeated observations of tigers in any given locale suggests that there may be no resident animals in China, i.e. all recorded observations may represent transient or dispersing animals. The exception to this generalization may be in the Wandashan Mountains along the Russian border, where a few individuals likely maintain territories that include both countries.

Reports indicated that low ungulate densities, habitat degradation, and increasing human pressures, particularly poaching, have effectively decimated a tiger population that once spread from Changbaishan Mountains opposite North Korea nearly 1,000 km north to the Wandashan Mountains close to the Russian city of Khabarovsk.

Both Sun Baogang, Director of the Wildlife Institute of Heilongjiang and coordinator of the survey, and Endi Zhang, WCS China Program Director for WCS, expressed disappointment at the results of the survey. "We were hoping for more encouraging results," said Endi Zhang, "but even in the Wandashan Mountains, once considered the stronghold of tigers in Heilongjiang, there are likely no more than 2-3 tigers."

Dale Miquelle, WCS biologist in Russia, who also participated in the survey, suggested that there still may be a future for Siberian tigers in China. "There is still good tiger habitat in China," he said, "and a healthy population of tigers across the border in Russia. If the forests can be protected, and if the prey populations are allowed to grow, tigers will naturally disperse into China."

Recovery of the Chinese population of Siberian tigers is possible, but it will take a strong commitment by the Chinese government, and tight controls on key forest areas. Guan Goshen, also of the Wildlife Institute of Heilongjiang, pointed out that close collaboration between Russia and China will be critical to insure that natural ecological corridors exist between the two countries that will allow for exchange of tigers and other native wildlife. Creation of international protected areas that include Heilongjiang and Jilin Provinces, as well as adjacent lands on the Russian side will protect critical habitat and provide linkages for tiger populations on both sides of the border. Primorski Krai has already moved forward with such plans with the creation of Borisovoo Plata Zakaznik (Borisovoo Plateau Wildlife Refuge), and Heilongjiang has agreed, in principal, to similar protected areas on the Chinese side. Such international protected areas have proven to be successful in other parts of the world.

1 Wildlife Institute, Harbin, Heilongjiang Province, China
2 Wildlife Conservation Society, Bronx Zoo, New York, USA

New Wildlife Reserve in Russian Far East

A new wildlife reserve has been created in the northernmost part of the range of the Siberian tiger. The reserve, named Zakaznik (wildlife refuge) "Mopay" has been signed into law by the Governor of Khabarovsk Krai.

Dale Miquelle, leader of the Russian Far East program of the US-based Wildlife Conservation Society and Hornocker Wildlife Institute, said the 54,000 ha wildlife refuge provided a secure corridor linking the coastal population of tigers in Khabarovsk with the inland population, which was largely separated by the crest of the Sihote-Alin range. The need for the zakaznik arose with the creation of a new road through the area, which provided accessibility and a real threat to the prey species that winter in the area - moose Alces alces and red deer Cervus elephas.

Miquelle said there was no evidence in the recent past of resident, reproducing females in the zakaznik, but with the continuing expansion of tigers on the coastal portion it was feasible that tigers might become more of a permanent fixture in Mopay. On a longer time span, if predictions of global warming for the region were correct, Mopay might become important habitat for resident, breeding females.
Workshop to Develop Recovery Plan for Siberian Tiger in China

With results of two years of surveys suggesting that the Siberian, or North Chinese tiger (*Panthera tigris altaica*) is on the verge of extinction in North China, a workshop is being convened in Harbin, Heilongjiang, in April 2000 to develop a recovery plan for the tiger.

The workshop, sponsored by the Ministry of Forestry and supported by the Wildlife Conservation Society, will attempt to identify key threats to wild tigers in north-east China, and then develop mechanisms to eliminate or mitigate such threats to secure a future for the tiger.

The objectives of the workshop are threefold:
1. develop a recovery plan that will be submitted to the Ministry of Forestry and hopefully incorporated as part of a Federally approved recovery plan;
2. include in the recovery plan a set of specific, concrete conservation actions that will lead to recovery of China’s wild Siberian tiger population;
3. encourage international organizations interested in tiger conservation to participate in the recovery process in north-east China.

All interested parties are invited and encouraged to attend. In addition to local participants, it will be especially important to have representatives from the international community to participate and demonstrate an interest in seeking means to assist in the recovery process.

Sumatran Tigers: From PHVA to Conservation Action

by Ronald Tilson*

The Sumatran tiger (*Panthera tigris sumatrae*) is listed as Critically Endangered by the IUCN Cat Specialist Group. The growth of the human population in Sumatra threatens to destroy much of the remaining suitable habitat for this tiger subspecies. Near forest-edge communities, hunting of wild pig and deer decreases prey availability, and grass cutting and fires set by villagers degrade available habitat, both for tigers and prey species. The market for non-timber forest products is lucrative in some areas. Tiger cubs are occasionally captured in protected forests and sold in illegal markets. Tiger parts, products of poaching and poisoning, are sold as traditional medicines, art and amulets, driven by the massive traditional East Asian medicine.

In 1992 the Conservation Breeding Specialist Group (CBSG) conducted a Sumatran Tiger Population and Habitat Viability Analysis (PHVA) workshop in Padang, Sumatra, in concert with the primary conservation authority in Indonesia, the Department of Forest Protection and Nature Conservation (PHPA). This meeting launched an explosion of tiger conservation activity among Indonesian and international organizations and agencies. The recommendations made at the workshop resulted in the creation of Indonesia’s *Sumatran Tiger Conservation Strategy* and an international collaborative effort to fund and carry out a long-term program to balance the needs of tigers with those of people.

PHVA workshop

The predominant issue at the PHVA workshop was the estimation of tiger numbers and distribution, as tigers are exceedingly difficult to observe or count in the forests of Sumatra. Even less was known about the extent of tiger-human conflict or the magnitude of the threats to this subspecies. A comprehensive Geographic Information System (GIS) database for Sumatra was compiled for use during the workshop in estimating available tiger habitat and populations.

Workshop participants estimated that there were approximately 500 tigers remaining in the forests of Sumatra, assuming that all available habitat was occupied and included sufficient prey. Smaller populations of tigers were estimated to be living in a number of isolated forest patches, only some of which are protected. Even within some of the large protected areas, the habitat is significantly fragmented and thus, tiger populations are probably also fragmented.

Human population growth, transmigration programs, and other pressures mostly linked to agriculture are causing a decline in non-protected tiger habitat, generally categorized as production forest. A gradual deterioration of habitat quality at the edges of protected forest is occurring as well. Another impact of human population growth is the removal rate of tigers through poaching, poisoning and official trapping. Two significant threats to tiger populations
were identified. One was the small size of existing tiger populations; the second was removal of tigers from these small populations, which had the potential to severely impact these populations. This finding brought home to participants how crucial it is to prevent tiger poaching.

Once any of the small tiger populations in Sumatra begins to decline, management strategies will need to be implemented to prevent extinction. Thus, there is a need to closely monitor populations on a continuing basis. Management strategies for wild tiger populations that were discussed included expanding protected populations by converting production forest to protected forest, stopping poaching, increasing the prey base, and exchanging or supplementing genetic material among populations (both wild and captive).

Post-workshop actions

Two years later, in recognition of the tiger’s critical situation, PHPA formalized the results of the workshop in a comprehensive action plan that prioritized the steps necessary for effective tiger conservation. This bilingual document, the Indonesian Sumatran Tiger Conservation Strategy, addressed four categories of recommendations necessary to ensure the long-term survival of Sumatran tigers within their remaining range:

• Secure and protect all remaining tiger populations and their habitat.
• Develop conservation management strategies for all remaining wild tiger populations.
• Develop a tiger captive management program for reinforcement and recovery of wild populations.
• Establish a communication network responsible for the survival of tigers in Indonesia.

Three years after the workshop, the Sumatran Tiger Project, a field-based study of wild tigers and their conservation needs, began to implement specific recommendations of the strategy. A companion study of human-wildlife interactions and attitudes of villagers living next to the park followed. Some components of these ongoing studies include:

Field-based conservation

The Sumatran Tiger Project was designed to provide a holistic approach to conserving the tigers of Sumatra. From 1995 to 1998, the project focused on defining the conservation requirements of wild Sumatran tigers in lowland rain forest habitat. The field study began at Way Kambas National Park in southern Sumatra, using remote infrared cameras and global positioning system (GPS) technology to establish tiger population densities in the park. A primary goal was to develop a technique to rapidly census tiger and tiger prey populations. Field information on habitat requirements, prey selection, and behavioral responses to disturbances further refined the conservation needs of wild tigers.

Community-based conservation

The community component used rapid assessments of villagers and detailed surveys to study land use patterns, human-wildlife conflicts, and attitudes of nearly 1,000 households in 25 villages living adjacent to the park. One significant finding was that there is little meaningful communication between villagers and forestry staff. We are now working to foster better dialogue and more cooperative interactions. The first community-based conservation activities, with support from university and government authorities, is taking place in villages near the park and includes meetings with local community leaders and forestry staff officials, and development of conservation awareness material.

Future of tiger conservation in Indonesia

In 1998 the Sumatran Tiger Project began taking on an expanded role in tiger conservation as one of the primary components under the newly-formed Indonesian Sumatran Tiger Program. This program was created to coordinate all tiger-related activities in Indonesia through a central coordinating committee comprised of three agencies: the conservation management authority (PHPA); the scientific authority (LIPI); and the ex situ management authority (TSI). The committee is responsible for strategic planning on a national level, setting policies and priorities for tiger conservation in Indonesia, and coordinating activities among the partnership organizations and agencies.

Over the next several years, the goal of the Sumatran Tiger Project is to identify the remaining tiger populations in Sumatra and to assess the threats to these populations. With this information, forestry staff can prioritize which tiger populations will form the future for the tiger’s survival in Sumatra. A cost-benefit analysis will be necessary because not all tiger populations can be secured. Some tiger populations may be too small, the threats may be too large, or the costs of protecting these tigers and their habitat may be too high. Once forestry staff make these decisions, the tigers and their habitat will need to be protected by inserting anti-poaching patrols, providing sufficient forestry staff to monitor these populations and habitats over time, and working with forest-edge communities to reduce tiger-human conflict. Conflict can be reduced by dealing rapidly with problem tigers, providing a clear message that forests are inviolate, and by working with community groups to find alternatives to their dependence on local forest resources. Integration of these responses will significantly help to secure the tiger’s future in Sumatra.

Tiger conservation teams

The Sumatran Tiger Project has created a field census methodology to census potential tiger habitat throughout Sumatra quickly, efficiently and economically. These rapid assessment teams, called Tiger Conservation Teams, are now gathering information on presence or absence of tigers and their prey, status of existing and potential habitat, and the extent and type of threats from surrounding villages, including poaching, encroachment, and habitat degradation. Team members are introducing local forestry staff and civilian authorities to the plight of the Sumatran tiger. At the same time, the teams review with local forestry staff the current and historical status of tigers in the area, their prey and habitat, and verify habitat boundaries. Project staff will visit community leaders and villagers knowledgeable about tigers and tiger-human conflicts, gather pertinent information about these issues, and document land-use patterns, human demographic patterns and socioeconomic status. At each local site, members will conduct public awareness sessions in schools, villages and forest-edge communities. Conservation education brochures about the status of the tiger will be distributed at every opportunity.

Problem tiger rescue team

Indonesia has deliberately linked in situ and ex situ tiger conservation activities. Unlike all other tiger range states, which have not linked field and captive conservation priorities, Indonesia formally declared the importance of this linkage through the Ministry of Forestry’s Sumatran Tiger Conservation Strategy and the Indonesian Zoologi-
CITES Mission to Tiger Range and Consumer Countries

A Technical Team from the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) visited 14 tiger range and consumer states in the course of 1999 charged with assisting in developing strategies for improving control of tiger trade and related activities.

Led by the CITES Enforcement Officer, British policeman John Sellars, the team visited Cambodia, Canada, China, India, Indonesia, Japan, Malaysia, Myanmar, Nepal, Netherlands, Russian Federation, United Kingdom, United States of America and Vietnam.

The lengthy report to the CITES Standing Committee covers major issues in tiger conservation, with an overview and detailed reports on the situation in the countries visited. Here follows a slightly condensed version of the team’s general observations. The full report is available on the CITES website <http://www.cites.org/>.

1. Conservation initiatives

1.1 Farming

It was suggested to the team that, given the proven success of breeding tigers in captivity with relative ease, such an approach would provide an answer to the present demand for the species.

The team cannot deny that captive breeding and ranching has proved to be a very effective means of enabling trade within the provisions of the Convention. Crocodile farms are a good illustration of this. The team doubts, however, whether such an approach would necessarily be beneficial to the survival of the remaining tiger subspecies in the short or mid-term and that the following factors require consideration.

a) Unlike the reptile skin trade where demand can be quantified, albeit approximately, most of the current demand for tiger and tiger products is illegal and, consequently, cannot be gauged to a meaningful degree.

b) Knowledge of wild tiger population numbers is so limited and relatively poor that the success or failure of such an approach could not be measured.

c) The likelihood of wild tiger populations being small, farming would provide an opportunity for laundering wild-caught specimens that would simply accelerate and/or assist current poaching and illicit trade.

d) As a response to the current problems, on its own, farming ignores the important other factors that a reduction in tiger numbers, as a flagship species, indicates. Range States might not consider and tackle degradation of habitat, loss of tiger prey species and the fact that illicit activities involving other species will invariably also be taking place and will not simply be restricted to tigers.

1.2 Hunting

Whilst there would undoubtedly be individuals who would be willing to pay substantial sums of money to hunt tigers, the team believes that the scope for this cannot be considered in the foreseeable future for the factors given at b), c) and d) above. Additionally, in the majority of range States visited, enforcement controls are not sufficient to allow adequate regulation of such an approach.

1.3 Eco-tourism

The tiger’s nature and behaviour does not readily lend itself to being viewed by tourists. Parts of its natural habitat, particularly some Asian jungle and densely forested terrain, is not conducive to visitors in the way that the savannah of Africa can be enjoyed.

That said, tiger range States contain beautiful landscapes that tourists could enjoy and these, together with the differing cultural experiences, would require to be accentuated alongside any opportunity to view wildlife. The element of chance in actually being able to see a tiger in the wild may, in itself, be a positive factor in attracting visitors. Similarly, the difficulties of access and lack of five-star accommodation facilities might also be seen as added attractions among the increasingly specialized ‘adventure’ holiday market.

The team believes that such approaches, especially if they employed traditional hunt-
ers who could identify likely viewing spots, might provide an opportunity for local communities to benefit from their fauna and flora.

In considering this concept, the team had in mind the work that has been done elsewhere to bring tourists into areas where they can see orang utan and mountain gorillas. Whilst the potential for such eco-tourism must be limited, it envisages that there may be a market for this and that some people would be willing to pay substantial sums for such an experience.

The team does, however, believe that eco-tourism involving tigers must be carefully considered, planned and controlled before it could be beneficial to communities and tiger populations.

India and Nepal have already demonstrated the success of eco-tourism, although it must be recognized that much of their tiger habitat may be more conducive to visitors than that of other Asian range States.

1.4 Rehabilitation and captive-breeding releases

The team is conscious of the work being conducted in this area and recognizes the potential of such schemes, especially given the reproduction success rates of tigers in captivity. It appears, however, that relatively few such projects incorporate, at present, elements that allow for the re-introduction to the wild of either captive-bred or confiscated animals. The team acknowledges the difficulties in preparing captive animals for a return to the wild. Captive-bred specimens may not have the hunting instincts and skills necessary for their survival in the wild.

The return of confiscated and seized tigers to the wild can be frustrated by risks of infection but, more importantly, the difficulties in identifying areas where they will not come into conflict with other tigers who have established territories. The team was told of the concerns, held by some persons involved in captive-breeding programmes, that re-introduced tigers might pose a threat to humans and/or livestock. That aspect clearly has considerable implications, not the least of which being potential litigation problems. It might also generate further animosity towards tigers and subsequent revenge killing of tigers.

There is little doubt, however, that population and habitat surveys may identify areas of suitable habitat that might be utilized for release programmes.

The team also believes that work on this subject will be of great importance, in due course, in relation to the introduction of animals to enable genetic diversity to populations that have been confined in areas where genetically viable populations have been seen as being at risk. The team also believes that recent research indicating that subspecies may not be so genetically different as might have been thought may provide greater opportunity for re-introduction schemes.

2. Negative factors

Regrettably, the team learned during its work that progress in tiger conservation and tackling illicit trade is, ‘in some Parties, hampered by the following factors.

2.1 Management and policy considerations

Albeit understandable in developing nations and those with economies in transition, conservation remains a low priority for many countries. The team saw examples of exploitation of natural resources, the sustainability of which must be questionable. Many range States have administrations that are based upon practices developed during colonial periods. Whilst offering employment opportunities for large numbers of personnel, they are not necessarily efficient and many people appeared to fill posts that were not especially demanding upon their time.

It was not uncommon for the team to encounter officials who were clearly embarrassed by their lack of ability to answer questions in a detailed manner or who could be seen to be delivering responses that did not truly reflect the situation in the field.

Lack of direction from and/or meaningful supervision by management appeared to produce a situation where some enforcement personnel do not seem to carry out the basic essentials expected of such a post, particularly active patrolling and/or seeking out offences and offenders.

Personnel whose remit includes the task of tackling poaching and illicit trade hold positions that were initially created with much simpler duties in mind and may not be equipped to combat present illicit activities.

Some administrations appear willing to allow NGOs and/or foreign finance and practical aid to supplement or provide enforcement actions that other countries would expect to be the responsibility of their own staff. This situation occurs despite the fact that some of the range States appear to have very substantial numbers of Rangers, Guards, Police and Military personnel, some of whom may be under-employed.

2.2 Corruption

All too frequently, the team was advised that corruption played a major part in the inability of some range States to tackle wildlife crime effectively. This was not surprising, given the poor salaries paid to government employees and the potential profits to be made from trafficking in endangered species.

Frustratingly, the team learned of many cases where the dedicated actions of such people as Forest Rangers came to nothing when offenders were subsequently handed over (as required by law or administrative edicts) to other agencies, for example, the Police in some countries, for further investigation and/or prosecution. The team was told of one anti-poaching unit that had detected 1,600 offenders in a four-year period. Of those, only 40 had subsequently appeared in court. It seemed to the unit that the majority of the other offenders had been able to corruptly escape further action.

It was also told of instances where alleged corruption among the judiciary seemed to result in penalties being imposed that did not reflect the crime and/or cases being dismissed before a proper hearing of the evidence had taken place.

2.3 Collusion

Whilst similar to the problems of corruption, this problem is perhaps worse in terms of combating wildlife crime. The team learned of instances where enforcement staff and government officials were actively cooperating with poachers and traders or deliberately ignoring illegal activities.

It was told of a case in one range State where a policeman was found to be a ‘middleman’, receiving illegally taken wildlife products which were then allegedly marketed by a Chinese contact. Although the matter has still to reach court, the team saw photographs taken during a raid on the policeman’s home where a ‘processing’ facility was found behind his house. Something of an abattoir was located where wild animals were skinned and subjected to taxidermy procedures. It was of considerable
credit to those involved that enforcement action was taken against an individual who clearly felt himself immune from the law.

The team heard of scenarios where senior provincial or district officials simply ignored directions from central government and directed local enforcement staff not to target poaching or wildlife trading.

In a number of range States the team observed that military personnel, perhaps having no truly legal or constitutional authority, are, in practice, regarded as the top level in the hierarchy of enforcement agencies. It heard of soldiers who were allegedly themselves active poachers. Indeed, press reports in one State identified a provincial military commander as the person responsible for controlling illicit wildlife poaching and trade.

2.4 Nepotism

The team heard of incidents in range States where appointment to positions in departments responsible for conservation and wildlife law enforcement relied more upon who you knew rather than what you knew. Indeed, the team met officials whose positions included responsibility for CITES implementation and enforcement issues but who clearly had no knowledge of national conservation and/or enforcement matters, let alone the Convention.

The team visited one Party where these problems were so well recognized amongst the public that it was commonplace for anything irregular or unlawful to simply be explained by quoting the initials, CCN, i.e. corruption, collusion and nepotism.

The team formed the impression that CCN is so extensive and ingrained in the cultures of some Parties that it was hard to believe that any progress could be achieved unless such practices were first eradicated. Regrettably, since such practices apply throughout everyday life, it seems unlikely that CITES concerns, often an already low priority, have much chance of breaking through those barriers.

3. Partnerships

The team saw many excellent examples of joint activities between government departments and agencies and NGOs. It was concerned, however, that some Parties might allow the willingness of NGOs to supplant what may truly be the country's own responsibilities. That said, the team vehemently believes that conservation of endangered species and enforcement of national and international law can only be effectively achieved through co-operation and multi-agency approaches.

It is anxious, though, that the role of government in conservation and wildlife law enforcement may not be sufficiently appreciated by the general public in many Parties and wishes to avoid the risk of such matters being seen as simply relating to NGOs. Whilst it would not, in any way, wish to discount the major part played by national and international wildlife and environmental conservation bodies, it does have some concerns about the way in which their involvement may be open to misinterpretation.

4. Enforcement and non-governmental organizations

The team noted that, in a number of States, the involvement of NGOs was almost essential to wildlife law enforcement efforts. Not only did NGOs identify unlawful activities, they actively researched illicit trade, obtained evidence of illegal practices, prompted and assisted government agencies in enforcement action and evidence collection and, thereafter, funded and co-ordinated prosecution.

The team acknowledges that the involvement of NGOs in some countries results in enforcement activities that would, otherwise, simply not occur.

It commends the work being done in a number of range States and acknowledges that very little, if anything, might take place in some Parties without their input.

The team does, however, have grave concerns over the level of involvement of NGOs. It is of the opinion that some governments have abdicated their responsibilities to a degree where NGOs almost control the enforcement of domestic wildlife laws in some areas. It is also concerned that some Parties have authorized NGO members to carry firearms whilst front-line enforcement personnel do not benefit from such powers.

The team believes that it is absolutely essential for national governments, and their enforcement agencies, to co-ordinate and control investigations into alleged incidents of wildlife crime. NGOs can play a vital role in detecting illicit trade and persons engaged in such activities. Such organizations, however, operate without the level of accountability that is commensurate with State professional enforcement agencies and prosecution authorities.

The team is concerned that covert operations by NGOs could, if not adequately controlled, actually motivate wildlife crime and was told that this might have taken place in some countries. 'Sting' operations are an important and highly useful tool in the armoury of enforcement agencies. It is vital, however, that they be targeted appropriately and strictly monitored and authorized by government officials.

The team recommends that all range and consumer States, as a matter of priority, have in place efficient investigation and prosecution authorities and that any involvement of NGOs be limited to the provision of appropriate assistance and expertise. The aim should be that the involvement of NGOs could be dramatically reduced because the State does all that is required to operationally combat illicit activities.

5. Enforcement issues

The team believes that Parties must acknowledge that, before they can truly be effective, enforcement officers should be trained and equipped to basic standards if they are to tackle wildlife crime meaningfully. At the very least they should have knowledge of:

a) relevant legislation and the powers granted to them
b) the importance of crime information and the recording and dissemination of intelligence
c) collection and preservation of evidence
d) basic scene of crime examination
e) self-defence and arrest techniques including, where appropriate, use of firearms
f) the questioning and recording of evidence from witnesses
g) lawful methods of questioning suspects and recording admissions
h) the modus operandi in common wildlife crimes
i) forensic science support available.

The team recognizes that the economies of many range States do not enable them to
pay salaries commensurate with high moti-
vation or to equip their enforcement person-
nel as they might wish.

Pursuant to Resolution Conf. 9.13 (Rev.), "RECOGNIZING also that long-
term solutions to the protection, conserva-
tion and management of the tiger and its
habitat require the adoption of bold and un-
precedented actions", the team believes that
it may be cost-effective and productive to
reduce the overall number of personnel in
some range States and use monies saved to
create and fund specialized units.

6. Forensic science support

The team believes that awareness of the
forms of forensic science support that are
potentially available to enforcement offici-
ers should be increased. Pathology, mor-
phology, ballistics, fingerprint identification,
questioned document examination and DNA
profiling are all examples of techniques that
operational staff could call upon. Even if
requests for forensic science support may, in
practice, be rare, knowledge of the tech-
niques available should enable enforcement
officers to improve their own evidence col-
collection work. Such awareness can also as-
sist during the interrogation of suspects.

The team recommends that considera-
tion be given to preparing a simple guide to
the forms of support available and the ways
in which they can be deployed to assist in
combating illegal killing of and trade in
CITES-listed species.

7. Tourist souvenirs
in duty free shops

The team was concerned to see that CITES-
listed specimens were for sale in duty-free
shops in many of the airports through which
they passed in the course of the missions.
That included Bangkok, Beijing, Hanoi, Ho
Chi Minh, Phnom Penh and Jakarta. Items
for sale included stuffed and mounted cat
species, traditional medicine products and
reptiles. Whole turtles and turtleshell prod-
ucts were common. Snake and crocodile
skin wallets and handbags were also often
seen. When asked, sales assistants invari-
ably said that no documentation was needed
to export the items.

Even if, in some instances, such sales
were not against national law the team feels
that it would be only fair to warn potential
customers that most, if not all, of such wild-
life products might be confiscated by Cus-
toms officers in, for example, Europe and
North America.

8. Education and awareness

8.1 Education and awareness
methodology

During the missions, the concept of educa-
tion and awareness programmes was men-
tioned many times and encompassed many
activities and different audiences.

Education risks being seen as a panacea
to all problems without being placed in
an overall approach to protect the tiger and its
habitat. The team believes that different audi-
ences require customized programmes and
that each programme should have specific
priorities.

The needs identified cover a spectrum
of audiences; politicians (decision makers),
Management and Scientific authorities, spe-
cialized enforcement officers, other enforce-
ment officers (Customs and Police), govern-
mental agencies with complementary man-
dates (forestry and agriculture), potential
partners (religious authorities and schools),
natural resource users (hunters, loggers and
farmers), and the general public (adults and
children).

Each audience has its own environment
and the choice of the approach is essential
for the success of the programme. Some will
be satisfied with an overview that makes
them aware of the issue, whilst others may
require detailed training to master the Con-
vention, their national legislation and tech-
niques related to the implementation of their
responsibilities.

Depending on the political structure of
the country, its experience with CITES and
the values of its society, the programme
should use adapted approaches and, where
necessary, different languages.

It may be counter-productive to believe
that the easy delivery of a single programme
or product will succeed. It is very important
to recognize cultural differences and de-
velop and customize programmes for each
country and each audience.

The team recommends the education and
awareness campaigns relating to Traditional
Medicine (TM) used by a number of Par-
ties. It is wary, however, that the focus of
some is too narrow. By concentrating on
megafauna species, such as the tiger, rhi-
oceros and bear, campaigns may create an
impression that only the well-known spe-
cies are of significance, which ignores the
fact that specimens of many CITES-listed
species feature in TM products. There is
also the risk that the impression is given that
the authorities are only interested in a
few select species.

The team believes that further thought
should be given to the manner in which
training is provided to enforcement person-
nel in range States. It notes that CITES
training and enforcement seminars, pro-
vided by a number of international, gov-
ernmental and non-governmental organiza-
tions, have been highly successful and ap-
preciated by recipients. It suggests, how-
ever, that there is considerable scope for
on-the-job training and that this might re-
quire the secondment of experienced Po-
lice, Customs and Wildlife Officers from
developed countries to enable the provision
of practical advice and information that can
not readily be conveyed, or learnt, during
the limited duration of seminar or work-
shop.

8.2 Conflict cases

Historically, there has been a widely held
belief that tigers that attack humans or live-
stock are old, injured or ill animals that are
prompted to do so because they are not fit
enough to kill their usual prey species.

In complete contrast, the team heard
during its missions that "problem" tigers
were routinely found to be young and fit
animals, often males, who were able to
carry out attacks, particularly on humans,
with considerable ferocity and strength.

It has been noted in a number of range
States, however, that man-eating tigers may
display old injuries consistent with their
having been targeted by poachers. The team
is of the opinion that it may be useful to
publicise this fact in awareness and educa-
tion campaigns. It recommends that States
publicize the fact that poachers are not only
breaking the law when attempting to kill
tigers but may also be endangering local
communities through their actions and risk
producing man-eaters.

8 Autumn 1999
The Challenge to Save India’s Forests and Wildlife in the New Millennium

by Valmik Thapar *

In September 1999 I was asked by the Ministry of Environment and Forests to visit Jamua-Ramgarh Sanctuary in Rajasthan State because the government was keen to alter its boundary. I had never heard of Jamua-Ramgarh, which is close to Jaipur and contiguous to Sariska Tiger Reserve. I got the shock of my life. It was a haven for the marble mining industry, which had ripped apart the earth; mile after mile was a scene of land overturned by mining. All of it was illegal under the Wildlife Protection Act, but had been authorized by the Ministry of Environment and Forests, even though it had no legal right to do so.

From the heart of the sanctuary, the equivalent of at least US$20 million has been turned over each year in marble sales, although this vital tract of land was contiguous to some of the finest tiger turf in Sariska. But because the area was unknown, unvisited and hidden from the public eye it had conveniently become a sanctuary for mines and exploited with impunity even though it was totally illegal. This was “protected” tiger country, but more than 25 km² of it has been gobbled up, chewed and defaced forever.

I knew then that we had reached the most dangerous moment in the history of our forests and wildlife – the great natural treasures of India. The makers of the law had become the breakers of the law and there was enough grey area in the law to exploit, to even get away with murder. We are at the end of a century and at the beginning of a new one – in fact this is the eve of a new millennium. Our wilderness is faced with the gravest possible crisis and we, as conservationists, both in government and outside it, are not even armed for the battle. Our information systems and levels of awareness are so completely inadequate that we have become pawns in a much larger and vicious game being played in the nexus of big business and the politics of India.

How are we going to save the wilderness? Do we have any idea of the fate of our 534 protected areas? I fear that our knowledge of them ends at 30, the most well known and accessible ones – the rest are on the road to oblivion. How can we stop it?

The task is enormous, but we cannot give up. We have got to move into the next century equipped to deal with the horrors that confront us. We must, first of all, learn every detail of the laws that govern our wilderness – the Wildlife Protection Act, Environment Protection Act and the Forest Conservation Act. We need to become legally literate. At the moment we are ignorant of the law. It is only when you know the law that you can detect a violation of it in the field. We have to ferret out violations of the law and correlate law and violation so that we are armed with reasonably watertight information, which is the only bullet we have to strike those that loot the wilderness. It is vital to have a detailed information system on each threatened protected area – as the first stage in preparing for battle. We need to read about the economics of the wilderness and understand how the iron ore and cement and marble industries work; we need to quantify the worth of our natural resources to the people and the nation and then, with this understanding, we must attack for the truth, for the enforcement of the laws, for the very future of mankind.

While intervening we have to protect our backs – the adversary also strikes where you least expect and so there must be a good bunch of lawyers to prevent fake cases, false complaints, intimidation or harassment of people in and out of government. Remember: saleable products worth huge sums are turned over, and in this big business there are vicious vested interests.

An “Attack and Defence Unit” is required with lawyers, media and the few honest politicians or bureaucrats that want to fight for the justice that our precious wilderness deserves – and of course people from any walk of life and especially representatives of local communities. So, if you have a Jamua-Ramgarh in your backyard, create an Attack and Defence Unit and fight the battle to save it – don’t give up. Use the power of collective strength in inter-disciplinary fields and enter the next millennium stronger, saner, and equipped and armed to fight the forces that destroy this nation’s natural resources. Attack through the courts, in the media, in the press and with frequent interventions with both state and central governments. Rally local people to fight against commercial exploitation and mining. Their protests are strategically vital. A majority of them will fight against the nightmare of mining and commercial exploitation that has resulted in polluting the air and water and sharply depleting the natural resource base. It is these local communities that also require, in their own language, the package of information on the site necessary for the unit to strengthen both its attacking capacity and defending ability.

Remember you cannot legally mine for marble or renew a lease in Jamua-Ramgarh Sanctuary, but it is done. Despite the law, the mining industry turns over vast sums in such places, but they never put anything back. Big business has ripped apart the finest parts of the country and I hang my head in shame at our businessmen and their ethics. Even the effluents of so many mines have polluted water, making it unfit for consumption, and dust from blasting has created so many particles in the air that it is unfit to breathe – and they all get away with such a magnitude of crimes.

There is not a second to lose – in defence of India’s wilderness we must join hands and use our brains to outwit those that are pilfering our natural resources and bending the laws. There are hundreds of cases waiting to be fought for. Get a list. Get into action. Raise the money you need from people you know, and create the vital attack and defence units and battle to save threatened sites. There is no other way left. Without such Attack and Defence Units the precious turf of the tiger will rapidly vanish.

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(Condensed from a contribution to Sanctuary Magazine, Mumbai, India)
Some South Africans Like Lions in their Streets, but Others Shoot them

The people of Marloth Park village on the southern edge of South Africa’s Kruger National Park like to have lions around as “guard dogs” to deter burglars and other would-be malefactors. But in another area 14 out of 21 lions which escaped from the park were shot by farmers after they stalked livestock, and three others were euthanized when it was found they had bovine tuberculosis.

A pride of about a dozen lions wanders around at night in Marloth Park, which has 140 permanent and 1,000 seasonal residents. Around the beginning of October, lions killed a man whose body was found near a stolen solar panel. They had dragged him from an acacia tree and eaten most of him.

In response to the killing, wildlife authorities arrived to shoot the lions responsible and drive the others out of the village area. But residents launched a “Save our Lions” campaign, protesting outside council offices and threatening court action to prevent moves against the lions.

One resident is reported to have said: “Marloth Park dies if the lions go. If we can’t physically stop it happening, I swear I will go out and buy lions at a game auction and put them here”.

However, the head of the Wildlife Protection Service, Jan Muller declared: “They’ll argue like mad for their lions today, but tomorrow, when a child is killed, they’ll blame us. Emotions are running high, but I cannot permit these lions to live in a residential area – it is asking for trouble.”

Marloth Park building codes forbid fences, dogs and alarm systems, and the area is said to have become fair game for housebreakers, with an average of 14 burglaries a week in 1998. When lions moved in and mauled six persons in six months, the crime wave halted. Nevertheless, one of the mauled said he wanted the lions to stay because they brought in money and kept the bad guys out.

After the killing, children continued to play unsupervised, and the latest craze was said to be to creep up behind someone and growl.

However, on the orders of the Mpumalanga Parks Board, the three guilty lions were drugged and euthanized. Radio collars are being fitted to the local lions and a joint team of local residents, the board and game rangers will monitor their movements.

Farmers shoot lions from Kruger

The 14 lions which were shot were among 21 which got through the fence in a matter of three weeks in July and August near Onderberg. A spokesman for Mpumalanga Parks Board said there was no reason for panic, but local residents were warned to be alert and report sightings without delay.

Six of the 14 lions killed were shot by one farmer. Three others were captured in a citrus orchard, but were euthanized when it was found that they had bovine tuberculosis, a disease which is thought to have originated in cattle and spread to wild buffalo in Kruger. The lions contracted TB from eating infected buffaloes. Now there are fears that wild animals will spread the disease to uninfected livestock.

An official said that, although lions occasionally left the park, it was unusual for so many to do so in such a short period of time. It was possible that there had been a population explosion among the Kruger’s lions.
Continuing Tiger Toll

India

Seizures of tiger skins in India between January and the end of October 1999 amounted to 24, according to a report by the Wildlife Preservation Society of India. In addition, six complete skeletons and 226.5 kg of bones were recovered, with another 50 kg offered by one of the traders. Ten tigers were found dead, one after a fight with another tiger, and others apparently poisoned. In one case, the bones and other parts had been removed.

Fake skins are being marketed; 16 were seized, along with 25 pieces of skin and two heads and jaws, all fake.

A total of 17 leopard skins were also seized in the same period.

South-East Asia

The September issue of TRAFFIC Bulletin, organ of the Trade Records of Fauna and Flora in Commerce organisation (TRAFFIC), reported that 11 tiger skins had been recovered in China’s southern Yunnan Province when it was found that wild animal parts were being smuggled by post. The authorities believe the suspects may have smuggled about 5,000 skins through the post, probably including more tiger skins.

The April issue of TRAFFIC Bulletin carried a report by P. Davidson of the New York-based Wildlife Conservation Society’s Lao Programme that over 70 clouded leopard skins had been on sale in Tachilek, a Myanmar town just across the border from Thailand. In 1998, items seen in Tachilek included four tiger skins, seven leopard, 52 leopard cat, 11 golden cat, and 16 marbled cat skins. However, the report said that far fewer items had been seen than in a survey in 1994.

Note

The extent of the toll of tigers, and other species, is impossible to assess. While full skins each represent a tiger, skulls and bones and other parts could come from the same tigers, or from others. However, it is generally agreed that seizures amount to a small fraction of the items in illegal trade. The average weight of the dried bones of a tiger is reckoned to be 12 kg, but leopard and other bones may be included in seizures.

1998 Far Eastern Leopard Census in Russia and the Status of the Subspecies Across the Far East

by D. G. Miquelle1, V. V. Aramilev2 and P. Fomenko1

As part of the continuing efforts to protect the last remnant population of Far Eastern (Amur) leopards (Panthera pardus orientalis) in south-western Primorski Krai of the Russian Far East, the Wildlife Conservation Society sponsored a survey to assess the status of the population in the 1998 winter season (Aramilev et al. 1999). Most recent surveys, including one conducted in 1997 (Pikunov et al. 1997) have suggested that 20-30 leopards remain in this fragment of habitat. However, with ideal snow conditions and employment of a slightly different methodology, the most recent survey indicated that there may be as many as 40-44 Amur leopards in the region. This survey also suggested that the number of tigers in this region (14-17) may be greater than earlier indications suggested. It is difficult to assess whether the differences in survey results reflect differences in methodologies (and snow conditions), or real changes in leopard and tiger numbers. All surveys continue to indicate that this subspecies of leopard is one of the most endangered large cats in the world.

Perhaps the most significant finding of the recent survey was evidence of a large number of kittens. While earlier surveys consistently reported few offspring, raising fears that inbreeding depression was resulting in low reproductive output, the 1998 survey reported 11 kittens associated with five females, including one female with three young. This increased reproductive output may indicate that poor recruitment is not a limiting factor for this population. However, continued monitoring will be necessary to place results of this survey in context.

While the Far Eastern leopard population once stretched westward from the southern Sikhote-Alin Mountains of Primorsky Krai, Russia, into the East Manchurian Mountains in Jilin and Heilongjiang provinces of China, all recent indications suggest that the Russian, coastal component of the East Manchurian Mountains is the last stronghold of the Far Eastern leopard. While as recently as the mid-1970’s there was evidence of leopards in three isolated populations across Russia (Pikunov and Korkisk 1992) and of a remnant population in China (Xingjia and Jinsong 1996), all recent information indicates that only the south-west Primorye population survives. A survey of the Pogranichny region (where one of the three populations formerly existed), by the 1998 survey team, as well as a special effort in the 1999 winter sponsored by the Tigris Foundation of Holland, revealed no evidence of leopards, and though evidence of leopards in southern Sikhote-Alin is sporadically reported, there is no evidence of a permanent, breeding population. Similarly, recent surveys in Jilin (Yang et al. 1998) reported evidence of leopards, but almost all signs was along the Russian border, with no evidence of a reproductively active population occurring anywhere in north-east China. North Korean officials have reported evidence of leopards (Institute of Geography 1998), but this information has not yet been corroborated. While North Korea represents the last potential site of a second population of Far Eastern leopards, most conservation efforts are presently focused on protecting leopards remaining in the Russian Far East (State Com-
committee of the Russian Federation on Environmental Protection 1999).

New initiatives led by Endi Zhang of the Wildlife Conservation Society, in cooperation with the Hornocker Wildlife Institute, are aimed at conserving potentially good leopard and tiger habitat (including well-managed forest tracts) in Jilin and Heilongjiang Provinces of China, just across the border from the existing Russian population. However, intensive use on the Chinese side by local villagers has eliminated the prey base. Better controls on activities of local people, and restricted access to key areas will be crucial to recovering the leopard population in China. It has been projected that such efforts, if successful, could result in nearly a doubling of the potential leopard habitat in a bilaterally-managed landscape. Such a transboundary habitat protection plan may be the best hope for this subspecies.

New transboundary development initiatives in the region, fostered by a UNDP-sponsored Tumen River Development Program, are one of the greatest threats to maintaining a continuous, unfragmented habitat across which leopards and their prey can cross international boundaries. The developing transportation corridor linking north-east China with seaports in Russia and North Korea is likely to eliminate any chance of retaining an ecological corridor between North Korea, China, and Russia unless serious mitigation steps are implemented in the near future.

References


State Committee of the Russian Federation on Environmental Protection.


1 Wildlife Conservation Society, Bronx Zoo, New York, USA
2 Director, Sikhote-Alin Zapovednik, Primorsky Krai, Russian Federation
3 WWF Russian Programme Office, Vladivostok, Russian Federation
Jaguar Conservation Program

by Cheryl-Lesley Chetkiewicz*

The jaguar, a potent symbol representing all that is wild, is a top predator ranging across a variety of landscapes throughout Latin America. It retains its religious, spiritual, and cultural significance for many of the indigenous people in the Americas.

Jaguar ecology however remains poorly understood. Starting in the late 1970s and early 1980s, Wildlife Conservation Society (WCS) scientists Drs George Schaller and Alan Rabinowitz, undertook ecological studies in Brazil and Belize, respectively. Since then, only a few comprehensive studies have been carried out and the status of the jaguar throughout its range remained poorly understood. By the end of the 1990s, there were ongoing research efforts in Argentina, Brazil, Costa Rica, Mexico and Venezuela. However no-one was addressing the conservation of jaguars as a species across its entire range.

Conserving such a wide-ranging species as the jaguar, requires an approach that focuses on assessing, prioritizing, and conserving not only the individual populations, but also the suite of adaptations and ecological interactions associated with them. Building on the results from the WCS/World Wildlife Fund priority-setting framework for tigers in Asia, WCS developed a geographic priority-setting exercise for jaguars.

In March 1999, WCS, in collaboration with Dr Rodrigo Medellin at the Universidad Nacional Autónoma de México and with support from Jaguar Cars, organized and facilitated a workshop appropriately titled, “Jaguars in the New Millennium”. This brought together over 30 jaguar researchers from the United States to Argentina to Mexico.

Led by Dr Eric Sanderson, WCS Landscape Ecologist, the workshop focused on determining the state of knowledge about existing jaguar populations and their status throughout Latin America. In addition, experts identified areas of remaining habitat where little or nothing was known about jaguars and those areas best suited for long-term conservation of jaguar populations. Current threats to jaguar survival, specific actions needed to reverse these threats, and research priorities were also addressed at the workshop. An analysis of the results and over 30 contributed research papers will be published in a Spanish-language volume due out next year.

Based on the priorities that emerged from the workshop, Dr Alan Rabinowitz, Director of the WCS Global Carnivore Program, and Dr Andrew Taber, Director of the WCS Latin America Program, developed a proposal for a comprehensive conservation program for jaguars. The Program consists of five components including: population status and distribution surveys, long-term research studies, jaguar-livestock conflict research and rancher outreach, population monitoring, and education and policy initiatives. As a result, Jaguar Cars awarded WCS one million dollars for the next five years to get this program underway.

To provide National expertise, input, and direction to the administration and management of the Program, WCS has created a Jaguar Advisory Group (JAG). The JAG includes: Dr Alan Rabinowitz, Dr Andrew Taber, Dr Howard Quigley, Dr Peter Crawshaw, Dr Rafael Hoogestijn, and Dr Marcelo Aranda. The first JAG meeting is scheduled for October 1999 and plans are underway to develop a website and brochure to provide further information on the Program and funding opportunities for jaguar research.

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Leopard Records in Armenia in the 1990s

by Igor Khorozyan*

The global concern on the status and survival of the Persian leopard (Panthera pardus saxicolor) in Armenia has slightly been increasing, and determination of the cat’s range becomes critically important. This article accumulates very scanty and scattered data on the leopard records/sightings/presence signs in the country in the 1990s and provides a rough estimate of the cat range.

The sites where people reported about the leopard presence are depicted on Fig. 1.

Point 1 in Autumn 1996 was immediately recorded by Bashkho, a herdsman in April 1986 which caused disappearance of a whole local sub-population (Khorozyan 1999). In 1993-94, however, three to four pairs resided in the reserve’s Kakavard (Quail Fortress) district (Walker 1994). Currently, eight individuals (two families, each consisting of male, female and two cubs) are living here (Anon. 1998).

Point 2. In 1993, a leopard pugmark was seen and outlined on the paper by Basil Ananyan, a young local bird specialist, on Garni river bank close to the northern border of Khosrov Reserve.

Point 3 beside Ekhegnadoz town is indicated by the Ministry of Environment (Anon. 1998b) as a leopard habitat. In 1992, an abandoned leopard den was found here in a crevice by tourists (zoologist Armen Amiryan, Yerevan, Armenia, pers. comm.).

Point 4. A young animal was recorded in 1995 on a cliffy overhang by a colonel who was driving his jeep over the road Ekhegnadoz-Goris (ornithologist Karen Agababian, Yerevan, Armenia, pers. comm.).

Point 5. Several leopards were seen in spring-fall 1998 in the vicinities of Hustoop Mt. (Anon. 1998a). In November 1997, an adult livestock-raiding leopard was killed near Kapan town by a professional hunter following the claims of local people (Armen Amiryan, pers. comm.). The picture of its skin is possessed by the
Fig. 1. The leopard records in Armenia in the 1990s. Numbered points (black quadrates) are described in the text.

Fig. 2. Human demography of Armenian provinces (Yerevan urban agglomeration excluded). Abbreviations of province names: AG – Aragatsotn, AR – Ararat, AM – Armavir, GE – Gegharkunik, LO – Lori, KO – Kotayk, SH – Shirak, SK – Syunik, VD – Vayots Dzor, TA – Tavush.

References

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14 Autumn 1999
Cougar Translocation in New Mexico

Intentionally moving wild animals from one locale to another is a technique that is used in wildlife management to establish animal populations in a new, or previously occupied area. Also, a "problem" animal is sometimes moved away from the site of the trouble, rather than taking the animal into captivity, or killing it. Moving wildlife is called "translocation."

In the past, large carnivores that were killing livestock or harassing people and their pets were simply eliminated. In fact, as the western frontier was occupied by Euro-Americans, bounties on wolves, coyotes, cougars and bears encouraged the local, or in some cases, range-wide demise of these species.

Translocation of carnivores, and cougars in particular, may become increasingly important as a management tool and conservation technique as attitudes change toward predators. Very little research had been done to evaluate translocation on cougars before Hornocker Wildlife Institute scientists Toni Ruth, Ken Logan, and Linda Sweanor conducted a study on this technique in New Mexico in the early 1990s. Our scientists worked with New Mexico Department of Game and Fish biologists, including Larry Temple.

The goals of the study were to evaluate translocation as a management tool that might be used to:
1. re-establish cougar populations in historically occupied territories;
2. improve the genetic pool of a small population by introducing cougars from outside; or
3. manage problem individuals. Cougars were captured from a study area in southern New Mexico, and translocated to a second study area in the northern part of the state.

A common misunderstanding about moving wildlife from one locale to another is that to be successful, we just have to match the animal with the appropriate habitat. But animals live in a complex social matrix with others of their own kind. Many animals need their own territory, or home range, where each individual has a defined area. If the social space doesn't exist for a new animal, it won't matter what habitat is available; they won't be able to find a new home. Since hunting and natural attrition (deaths) were both at work in the northern release site, the translocated cougars, we surmised, could find vacancies, and occupy them anew.

Fourteen cougars were captured and translocated during the study. They were moved 300 miles from their former range to areas in the northern study area. Radio collars were placed on these cougars, and they were monitored after they were released in the new area. Two cougars were only monitored for a month or less, but most were monitored for nine months to two years.

The most desirable outcome for translocation would be to have the cougar remain in the area where it was released, and to settle down quickly and establish a new home range. The worst outcome would be for the cougar to start wandering after translocation, on an extended journey, trying to find its way back to the original home range. This kind of behavior can expose the animal to many dangers, and the ultimate outcome is often death.

Eight of the monitored cougars in the Institute study eventually moved 50 miles or more from their release sites, and their movements were generally southerly. They were probably tending to move back toward their original homes. Two male cougars that were translocated actually did make it all the way back to their original home ranges.

The results of the study showed that the outcome of cougar translocation seems to be influenced by the age of the cougar. Translocation worked best for cougars that were 12-27 months old. These cougars quickly established new home ranges after translocation, and 50% survived to the end of the study. Mature, breeding cougars (2-6 years old) in the study had the strongest tendency to try and return to their original home ranges. The oldest cougars (older than eight years) had the poorest survival in the study; both older cougars in the study were killed by other cougars after they were released in the new area.

By the end of the study, none of the 14 cougars had died. This was an abnormally high mortality rate, higher than that for cougars in the southern study area. Also, the majority of the deaths occurred in the second year after translocation. Our Institute scientists think that chronic stress may be a factor for these translocated cougars, especially for the mature and older cougars. The causes of death were similar to those for cougars in other parts of the country, though.

Translocation can be a useful technique when trying to resolve conflicts in wildlife management, or for long-term population management. Options available when there is a conflict with a wild animal include capture, euthanasia, or translocation. Institute scientists do not recommend translocation when the problem with a cougar involves attacks on people. Cougars like these are too unpredictable, and capture or euthanasia is necessary. It may be possible to translocate a "problem" cougar preying on livestock or pets, if the new area for the cougar does not have livestock or human residences.

In all situations, wildlife authorities will deal with each problem cougar on a case-by-case basis. Our study results show that the best probability for successful translocation will occur with independent young cougars (12-27 months old). This age group is only a small part of any cougar population, though.

Even with the best outcome, translocation remains a risky and expensive wildlife management option. It's important to try and deal with situations that lead to cougar problems before they become problems. We know that the very best approach to cougar conservation is to maintain large expanses of suitable habitat that will allow natural movements of cougars. But in our developing West, it will also become increasingly important for us to look on the other side of the equation, for innovative ways to decrease the potential for cougars to become problems.

Utah and New Mexico Wildlife Boards Set Hunting Quotas

Utah Wildlife Board has set a quota of 415 cougars for the 1999-2000 hunting season, an increase on last winter’s 407 quota.

The Salt Lake Tribune (19 August 1999) said the board rejected pleas from non-hunters to end the use of hounds in pursuing cougars, to end all cougar hunting in the state, and for 20 to 30 percent reductions in harvest.

It also rejected requests from southern Utah hunters to increase the number of cougars killed and lengthen the season by a month. A special hunt near Mount Timpanogos to protect bighorn sheep that will soon be transplanted there was authorised.

The board also tried for the first time to meet performance targets it adopted last March to manage cougars. Those targets called for an adult survival rate of at least 65 percent; that cougars older than five years old should constitute at least 15 percent of the total population, and that the percentage of females should not exceed 40 percent. That policy drew praise from the regional wildlife managers who must make cougar harvest recommendations to the board.

Arguing for harvest reductions, cougar hunting opponents focused on a survey conducted by Utah State University that showed a majority of the people of Utah opposed cougar hunting or the use of hounds to hunt cougars and bears.

New Mexico to protect wild sheep by cutting cougar population

New Mexico game managers propose shooting dozens of cougars Puma concolor in order to allow dwindling numbers of bighorn sheep Ovis americana to recover.

According to State biologist Bill Dunn there are about 540 Rocky Mountain bighorns and 220 desert bighorns in New Mexico and about 2,000 cougars. The cougars are said to have increasingly preyed on the bighorns because of a decline in the deer population. Of 100 radio-collared bighorns, 53 have died since 1993, three-quarters killed by cougars.

The State Game Commission was expected to give permission for the killing of as many cougars as the Game Department sees fit in an area of 224 km² in the Manzano, Ladrones, Hatchet and Peloncillo mountain ranges. About two dozen cougars a year were expected to be shot.

At the same time, the game managers plan to help the deer population by killing hundreds of coyotes Canis latrans which are said to kill fawns. However, studies of the effectiveness of removing coyotes have had contradictory results.

Animal rights and environmental organisations denounced the plans. John Horning of the Forest Guardians Group declared that New Mexico’s bighorns were limited to a fraction of their historical range because of bad management and diseases caught from domestic livestock.

“I don’t think a bullet in a cougar is a healthy response to the situation,” he said.

Lisa Jennings of Animal Protection of New Mexico said the department had in fact slaughtered too many deer in the past and was blaming cougars for their lack of proper management practices.

Florida Panther Breeding Experiment Declared Success

Introduction of eight female Texas cougars Puma concolor stanleyi to southern Florida in 1993 to improve the genetics of the local Florida panther P. c. coryi has been a success, with 15 kittens born, according to wildlife officials. Despite the different names, they are the same species and in former times the two subspecies are presumed to have overlapped and interbred.

Now the cougars may be captured and returned to Texas because they are taking up space needed for the Florida panthers.

There would have been more kittens, but one female cougar died in August from pregnancy problems. Another cougar was killed by a vehicle and a third was found shot dead.

Officials said the programme had cost US$10,000, which was raised by sale of licence plates depicting the panther.

There are estimated to be 50-70 Florida panthers in the wild. Once ranging through the southeastern states, the panther survives only in the south of Florida because of rapidly increasing human population and loss of habitat to consequent development.

DNA Assessment of Puma Subspecies

Over 30 subspecies of puma Puma concolor (also known as cougar, mountain lion, panther and other names) have been described, but genetic research is indicating that only six should be recognized by science.

At the 1999 meeting of the American Genetic Association, researcher Melanie Culver said that blood and tissue samples from 209 pumas in zoos, museums and the wild across North and Central America, and 106 from South America had been examined at the Laboratory of Genomic Diversity, National Cancer Research Institute in Frederick, Maryland. She and other researchers looked for sequence differences in three mitochondrial genes and 12 microsatellites—short bits of repetitive DNA sequence that lengthen and mutate through time and thus indicate the relatedness of organisms.

No differences were found in the mitochondrial DNA of North American pumas, and their microsatellites were “virtually indistinguishable”. This suggested that the 15 listed subspecies identified by their regions and appearance were in fact the same and constituted just one subspecies, Culver said.

In Central America, the studies showed that there is only one subspecies, while in South America there are four.

The most genetically diverse pumas were found to be in Paraguay and Brazil, south of the Amazon river. They are the oldest puma race, dating back 250,000 years. Their northward radiation led to the evolution of the other subspecies.

Final results of the studies will be published in a scientific journal. The results could affect the conservation programme for the critically-endangered Florida panther P. c. coryi. Isolated in the southern portion of Florida, there are only 50-70 panthers. A trader’s release of some South American pumas in the Everglades introduced new genes, and, as part of the continuing conservation programme, female Texas cougars P. c. stanleyi were released to improve the genetics of the panther (see “Florida Panther Breeding Experiment Declared Success” above).
Ecology of the Clouded Leopard in Khao Yai National Park, Thailand

by Sean C. Austin and Michael E. Tewes*

Introduction
The clouded leopard *Neofelis nebulosa* is one of the most enigmatic wild cats in the world. It is a medium-sized (11-20 kg) wild cat found in much of southeastern Asia. Its geographic range runs from central Nepal to southern China and south through peninsular Malaysia, including the islands of Sumatra and Borneo (Corbet & Hill 1992). It is found as far east as Taiwan, although the last confirmed sighting there was in 1983 (Rabinowitz 1988).

There is very little scientific information on this species in the wild. Most available information is anecdotal, based on local surveys and interviews, from sighting reports, or based on captive accounts (Nowell & Jackson 1996). The clouded leopard is, at present, listed by IUCN as Vulnerable (IUCN 1996) and listed under CITES Appendix I, which bans international commerce. It is a species drawing great interest due to its secretive habits. It is disinclined to leaving scat and scrapes along forest trails (pers. obs.) (Rabinowitz et al. 1987); prefers primary evergreen forest; and plays an important role as a large carnivore. Being a large carnivore, it tends to use larger areas than herbivores of similar size (Gittleman & Harvey 1982) making it an appropriate indicator species for conservation.

This study is focusing on the ecology of sympatric carnivores in Khao Yai National Park, a large (2,168 km²) protected area in central Thailand, with a particular emphasis on wild felids. The study area covers approximately 100 km² of mixed deciduous and semi-evergreen forest with approximately 20% of the area covered by grassland and open gravel/shrub habitat. Elevations in the study area range between 750 m and 850 m. There is a consistent history of clouded leopard presence in the study area, with park staff and visitors (Davies 1990) noting regular sightings.

During the study, we have captured and radio-collared two adult clouded leopards. Only one clouded leopard has ever been studied using radio-telemetry (Dinerstein & Mehta 1988). In that instance, a young male was captured adjacent to Chitwan National Park, Nepal, translocated within the park boundaries, and released. The cat was lost after two weeks due to official restrictions on tracking. The radio-collared clouded leopards from this study, one female and one male, which have been tracked for only four and two months, respectively, represent the first to be studied in their own home range and habitat. Records from camera-trapping have produced three photos from this study and four from Wildlife Conservation Society (WCS) field-work. The following information is a preliminary summary of trapping, telemetry and camera-trap findings.

This study is conducted by the Feline Research Center of the Caesar Kleberg Wildlife Research Institute at Texas A&M University – Kingsville. Financial support is also provided by the Feline Research Center. Sean Austin is participating within the Joint Ph.D. Program of Texas A&M University – Kingsville and Texas A&M University – College Station with Drs Michael Tewes and Nova Silvy serving as project supervisors.

**Trapping**

Of the two live-captures, the first was a mature female captured in a smaller (150x44x44 cm) steel-mesh trap along a trail in primary semi-evergreen forest. Upon approach, the female clouded leopard was very calm and remained tranquil during and after the entire sedation process.

Table 1 lists the physical parameters and other noted capture information for both clouded leopards. The female was blind in one eye, probably due to an injury as the entire orbit was white rather than only the pupil.

The male was captured in a large (200x100x100 cm) wooden box trap in similar habitat. Its behavior was much more typical of an entrapped wild felid, with back and forth pacing and threatening displays. Sedation for both individuals was quick and without problems. The male also had a significant handicap, with one of its upper canines broken off. The injury appeared old as the remaining tooth portion was worn smooth. Also, the male had what appeared to be a large tumorous growth on the top of his nose.

Both captures occurred within two months of each other and the first after 15 months and 4,606 trap nights. Before the initial capture there were numerous clouded leopard sightings along roads and seven camera-trap photos. Given the number of trap nights and numerous locations where traps were placed, it is probable that clouded leopards were encountering traps but not entering. At the capture location of the male clouded leopard, a different clouded leopard had been photographed and a live-trap had been open for 15 months. The lack of overall success in this and other studies suggests that there is some inherent behavior that makes clouded leopards wary of enclosure traps and thus difficult to capture for study. It is also likely that, since both cats were individuals with significant previous injuries, they may have been impaired from successfully hunting their normal prey and were behaving atypically when entering the traps.

**Home range use**

Preliminary home range analysis using the minimum convex polygon method indicates home range use by clouded leopards is much greater than would be expected for cats of this size. For the female, from 60 relocations, the home range is 33.3 km² with a core

<table>
<thead>
<tr>
<th></th>
<th>Capture Date</th>
<th>Trap Type</th>
<th>Bait</th>
<th>Age</th>
<th>WT (kg)</th>
<th>TB (cm)</th>
<th>TL (cm)</th>
<th>HF (cm)</th>
<th>ULC (cm)</th>
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<td>Female</td>
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<td>steel mesh</td>
<td>live chicken</td>
<td>Adult</td>
<td>11.5</td>
<td>94</td>
<td>82</td>
<td>17</td>
<td>3.5</td>
</tr>
<tr>
<td>Male</td>
<td>11 July 1999</td>
<td>wood</td>
<td>live chicken</td>
<td>Adult</td>
<td>18</td>
<td>108</td>
<td>87</td>
<td>18.5</td>
<td>4.1</td>
</tr>
</tbody>
</table>

Age – Based on tooth wear, body size, and overall condition
area (85% relocations) of 21.1 km². Due to this use of large areas, telemetry equipment could not always receive an initial signal. For the female, 16 (21%) of the 76 relocation attempts proved unsuccessful. Therefore, the area actually used is likely to be larger. Only two of 60 relocations (~3.3%) showed the female in grassland and open gravel/shrub habitat which indicates a strong preference for denser evergreen forest.

Though produced from fewer relocations, the male clouded leopard is using a similarly large area. The male is using a home range of 36.7 km² in 34 relocations, with a core area of 21.6 km². Because of the location of its home range, the male has been easier to find. However, seven of the 41 (17.1%) attempts proved unsuccessful, also suggesting that it is using a larger area. Similarly, the male shows a strong preference for dense evergreen forest, being found in grassland and open gravel/shrub habitat in only three of 34 (8.8%) relocations.

The habitat preference for these two individuals concurs with most sighting accounts and camera-trapping evidence that clouded leopards prefer primary evergreen forest even when other habitats are available. However, reports suggest that this cat is to some extent ecologically flexible and can use selectively logged forest (Rabinowitz et al. 1987), tall grassland and marginal scrub forest (Dinerstein & Mehta 1989), and dipterocarp forest (Santipailai & Ashby 1988) when needed. The size of the areas used is surprising as these areas (33.3 km² and 36.7 km²) greatly exceed the size of male leopard (Panthera pardus) home ranges (18 km²) elsewhere in Thailand (Rabinowitz 1990; Grassman 1997).

Activity and movement

Literature is contradictory concerning the activity patterns of clouded leopards. While older (Lekagul & McNeely 1977) and recent (Kanchanasakha 1998) literature suggests clouded leopards are strictly nocturnal, preliminary results from this study do not indicate this pattern. Both clouded leopards exhibit cathemeral (active day and night) patterns with significant increases during crepuscular hours. The female shows more diurnal activity, being active for approximately 45% of daylight observations, while the male shows activity for 35%. For both individuals, activity dramatically increases during evening crepuscular hours, increasing to 85% active observations. Nocturnal activity (about 60% of the observations) remained higher than diurnal activity for both. Both individuals displayed a pronounced decrease in activity during the mid-diurnal (11.00-14.00h) and mid-nocturnal (02.00-05.00h) periods.

Both clouded leopards are very active in terms of movement and distances traveled. The female has been relocated on 33 consecutive days with a mean daily movement of 958 m. The male has been relocated on 14 consecutive days with a slightly greater daily movement distance of 1,076 m. This information supports the belief that clouded leopards use trees more for resting (Rabinowitz 1987) than actual movement through the forest. It would be difficult to cover these daily distances without spending much time on the ground.

Two weeks after capturing the male, both clouded leopards were observed using the same general area on a daily basis. Initially it was thought the two clouded leopards were a pair as they are known to pair-bond in captivity and there are records of pairing in the wild (Lekagul & McNeely 1977). After six days they moved in different directions, at which time it was suggested (G. Law pers. comm. 1999) that the two were together while the female was in oestrus. Yamada and Durrant (1988) found clouded leopard mean oestrus duration to be 6.2 days, which concurs with data gathered here.

Camera-trapping

Since October 1997, seven photos of clouded leopards have been produced within an area slightly larger than the study area; three from this project and four from WCS work. Clouded leopards can be individually identified by their distinct markings. From camera-trap evidence and the two live-captures there are at least six (perhaps seven) individual clouded leopards within approximately 100km². Without delving into the number of females within a male home range and the extent of inter- and intra-sex home range overlap, a very crude estimate of 100-120 clouded leopards for Khao Yai National Park can be estimated. There is a significant amount of human pressure at the perimeter of the park which may reduce edge density; however, this perimeter decrease may be balanced by much of the park being undisturbed and with a higher density than the study area which has significant traffic and tourism.

This study has the opportunity to finally shed some light on the behavior of the clouded leopard in the wild. Two, though a small sample, represent the first efforts into learning about such specific behaviors as home range use, activity, movement, and habitat use. This study will provide baseline information needed to better understand the ecology of this cat and ultimately predict its reaction to ever-increasing human pressure.

References


IUCN—the World Conservation Union. 1996. 1996 Red list of threatened animals. IUCN, Gland, Switzerland.


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Colorado Lynx Reintroduction

by Kim Poole and Tanya Shenk

Despite controversy and an inauspicious start (Cat News 30:15-16), the project to reintroduce Canada lynx (Lynx canadensis) to Colorado is on track. Further releases of lynx are planned for this coming winter. The decision to continue reintroduction efforts and add to the 41 lynx released during this past winter and spring was based on the promising results reported at a project evaluation meeting held in late August 1999.

Lynx historically roamed throughout the high-elevation conifer forests along the Rocky Mountains in the western half of the state. As in the rest of their range, historic lynx distribution in Colorado likely tracked the distribution of their primary prey, the snowshoe hare (Lepus americanus). At the southern extension of their range in North America, and adapted to relatively low densities of hares, lynx were probably never abundant in the state. Unregulated trapping and poisoning from predator control efforts likely contributed to the extirpation of the species in the early 1970’s.

In a project led by the Colorado Division of Wildlife (CDOW), lynx were obtained from British Columbia, Yukon and Alaska during January to April 1999. Lynx populations in much of their northern range are currently at peak levels, tracking the high numbers of the snowshoe hare. The lynx were obtained through the cooperation of jurisdiction agency biologists and local trappers, using the most humane methods to protect the animals and minimize injuries. The lynx were transported to a holding facility in Colorado over a three-month period in mid-to-late winter.

The area targeted for initial release efforts centered on the San Juan Mountains in southwestern Colorado, where preliminary surveys indicated the highest levels of hare and other potential lynx prey. All lynx were radio-collared to enable monitoring of survival and movements. The initial release protocol called for the immediate release of females once they passed veterinary inspection in Colorado. Males were to be held for a period of weeks until females established a territory, and then males were to be released near female territories. Four animals were released in early February. However, three of these died of starvation within six weeks of their release and the fourth was recaptured and returned to the holding facility where she recovered and was later released again.

Retrospection on the animals released under the first protocol suggested that these animals may not have been in optimum physical shape when released. Therefore, a second release protocol was initiated whereby lynx were held at the Colorado holding facility for a minimum of three weeks and fed high quality diets to encourage weight gain. Most lynx gained 10-15% of their body weight while in captivity. Nine lynx were released under this second protocol; to date one juvenile female from this protocol has died, also of starvation.

After the death of the lynx under the second protocol, a third release protocol was developed that called for releasing all subsequent lynx in the spring, when prey would be most abundant. Twenty-nine lynx were released under this protocol, of which seven have died to date: two were hit by cars, one was shot, one died of starvation, one died of probable starvation, and two died of unknown natural causes other than starvation. Thus of the 22 female and 19 male lynx released (six female and one male lynx 9-12 months of age and 34 adults), 11 mortalities have been recorded to date. Of the five confirmed starvation deaths, three were associated with animals released in less than ideal condition and two were lynx less than one year old. The three lynx that were shot or killed by cars in June and July were in good body condition, and starvation was ruled out as the cause of death for the two lynx that died of unknown natural causes.

Through extensive aerial radio-tracking, 17 lynx have been located within a roughly 200 km x 145 km area surrounding the release sites in the San Juan Mountains. Eight animals are known to have moved away from this core area, most in a northerly direction. Six lynx (five males, one female) have not been found since 15 July. A number of lynx appeared to have made exploratory movements of up to 100 km, and subsequently returned to the core area. Preliminary trends suggest that juvenile (10-12 month old) females appear to establish ranges closer to the release sites than adult females, and, as expected, male lynx tended to disperse farther than females.

The above results were reviewed during a project evaluation meeting of the Colorado Department of Wildlife’s Lynx Recovery Team and the Lynx Advisory Team, made up of scientists from western United States and Canada, held in late August 1999. The consensus was that, barring significant mortality during the coming winter, up to 50 additional lynx should be released in the core area to augment the animals currently present. Proposed monitoring and research will include continued aerial radio-telemetry, snow-tracking to provide information on habitat use and hunting behaviour, and further assessment of snowshoe hare densities in the state.

As noted in the last issue of Cat News, the reintroduction was initially opposed for a variety of reasons by a number of agricultural groups, animal rights groups, trapper organizations and some biologists, especially so after many of the initially released lynx starved. Marc Bekoff, of the University of Colorado, argued that the reintroduction should not have proceeded, primarily for ethical reasons (1999, Endangered Species UPDATE 16:27). Others argue that the science behind the reintroduction was poorly done, and the risk and cost of failure was too great (1999, Science 285:320-321). The only other lynx reintroduction conducted in North America, into northern New York State in the late 1980’s, appears to have failed. Looming over the entire program is the pending US Fish and Wildlife Service decision, expected to be rendered in January 2000, on whether lynx populations in the United States south of Canada should be listed under the Endangered Species Act. Fish and Wildlife Service representatives at the evaluation meeting suggested that listing would have little direct impact on the Colorado reintroduction efforts.

Many eyes are watching the fate of the lynx currently roaming the mountains of western Colorado. The coming winter will likely prove to be the litmus test for the project; if too many lynx starve then the project will be regarded as a failure by many people. For some, the end goal should not be lost in amongst the political and biological debate. As noted by Steve Buskirk, a zoology professor at the University of Wyoming and Lynx Advisory Team member: “If we can establish a lynx population that will be there for our children and grandchildren, this recovery work will be well worth the effort”.

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2. Colorado Division of Wildlife, 317 West Prospect, Fort Collins, CO 80526, USA (Tanya is the lead field researcher for the project)

by Luke Hunter*

Historically, translocation and reintroduction of large African carnivores has been widely practised, but such efforts have been poorly researched and the little data which exist indicates these projects are largely unsuccessful. Daily monitoring of 13 lions Pantera leo, 15 cheetahs Acinonyx jubatus and their offspring which had been reintroduced into the Phinda Resource Reserve in northern KwaZulu-Natal was conducted for 40 months (May 1992-September 1995) to collect information on various aspects of their behaviour and ecology. The same populations have been monitored intermittently from September 1995 to the present. The study aimed to assess the success of such restoration attempts and to determine whether reintroduction is a viable method for the re-population of large felids in areas of their former distribution.

Two earlier reports (Cat News 24:15-16, 25:14) presented detailed information of the study site and preliminary findings from this study. This article is a summary of the author's completed Ph.D. thesis (Hunter 1998).

Most previous efforts to translocate or reintroduce large African felids were 'hard releases', usually lacking consideration for various factors which would be expected to influence the success of such procedures. Parameters such as trauma or disorientation associated with capture and translocation, the presence of resident conspecifics, the availability of space for released individuals, and the probability of individuals leaving the release site and encountering conflict with humans were often poorly known. During the present study, significant effort and resources were invested to attempt to address these factors and overcome at least some of the problems typically associated with carnivore translocation.

Following experience from Europe and North America (largely with non-felids), the Phinda study adopted 'soft-release' techniques, the first large-scale project to do so with African cats. All individuals in the present study underwent a pre-release captivity period of 6-8 weeks at the release site. Additionally, release events were staggered and took place from different locations within Phinda to: 1) allow individuals sufficient time and space to establish home ranges before the potentially disruptive effects of subsequent releases, and 2) reduce the chances of newly released individuals encountering territorial conspecifics soon after release by locating later release sites outside the home ranges of established individuals. Finally, the reserve lacked resident lions and cheetahs and was entirely surrounded by 2.2m high electrified fencing to attempt to discourage reintroduced cats from leaving the site.

All reintroduced lions and cheetahs remained at the reserve. Animals generally did not display 'homing' behaviour characteristic of many previous carnivore translocations. Three groups of lions and cheetahs (largely young males) showed evidence of homing for two months following release, but all subsequently established home-ranges at Phinda. The reserve's boundary fence was a critical factor in restricting post-release movements of felids. The study also demonstrated that, when co-housed during the pre-release captivity period, unfamiliar and unrelated individuals of each species established enduring relationships which persisted long after release. This has important implications for translocation attempts where individuals are frequently captured opportunistically, usually when they leave conservation areas and come into conflict with humans. This technique facilitated the formation of socialised groups composed of such 'problem animals', which — for social carnivores — are probably better suited for reintroduction purposes than lone individuals.

Reintroduced lions and cheetahs at Phinda which survived the crucial early post-release period established home ranges in the reserve, most of which endured for the duration of the study. This suggested that reintroduction may be a viable method for re-establishing resident felids. Lions (of both sexes) and male cheetahs were territorial whereas female cheetahs showed no signs of establishing territories and, in some cases, used the entire reserve as their home range. Lion individuals and groups used between 27.56 km² and 130.20 km² as their home-ranges in Phinda. Mean home range size of female groups was 52.83 km² ± 35.68 km² (range: 27.56 km² - 105.60 km², n = 3). Male home-ranges reflected their attempts to encompass as many female territories as possible and were as extensive as 78.7% of the entire reserve (which is 180 km² in size). Lions showed evidence of home-ranges shrinking during the dry winter, probably reflecting the distribution of artificial water sources in the reserve. The placement of such waterpoints may be an important issue for the management of predator-prey relationships in small reserves.

Mean size of the territories of male cheetah coalitions was 92.89 km² ± 59.39 km² (range 56.79 km² - 161.44 km², n = 3). Territories were fiercely contested and fights between rival coalitions resulted in four deaths of males during the study. The 'patchiness' of available preferred habitat may have increased the likelihood of conflict between male cheetah coalitions. Such habitat, particularly open grassland, formed the core areas of both male and female cheetah's ranges. In 'reclaimed' conservation regions, such as Phinda, where historical human influences, such as cultivation, intensive livestock farming and the extirpation of indigenous bulk grazers and browsers (for example, elephants) may radically alter the structure of habitats, the planning of a restoration attempt of cheetahs must include consideration of available suitable habitat. The 'rehabilitation' of human-altered landscapes may be an important factor affecting project success.

The greatest cause of mortality to reintroduced felids was as a result of human activity, particularly poaching. Five reintroduced lions and two cheetahs were killed in wire snares. Other human-mediated causes of mortality included road-kills and poor boundary security; which allowed individuals to leave the reserve and enter farming communities where they were ultimately killed by humans. Practitioners of reintroductions need to be aware of the influence of human activity on carnivore re-establishment and allocate resources accordingly to moderate its effect.
Inter and intra-specific conflict with other large carnivores was also a significant cause of deaths of reintroduced cheetahs and their offspring. While this is inevitable in any natural system, practitioners of multi-species reintroductions, such as at Phinda, should consider establishing competitively vulnerable carnivores prior to releasing ecologically dominant species. Delaying the release of lions until reintroduced cheetahs have had a chance to reproduce and their offspring have dispersed and established home ranges may ameliorate the effects of lion predation on cheetah re-establishment.

Despite mortalities, population characteristics suggested that lions and cheetahs are rapid and effective in re-colonising vacant areas. Most lions and cheetahs survived the critical early post-release stage (three months) and a minimum of 60% of females of both species survived to reproduce. Three lionesses bore litters before their third birthday and five male lions sired cubs at 26-28 months old, which is generally earlier than in established populations. Cheetahs at Phinda probably also had opportunities to reproduce younger than elsewhere, though this is based on circumstantial evidence. The opportunity for hastened reproduction may have arisen as a result of low population density allowing normally subordinate individuals to breed earlier than in established populations. This was probably a significant factor in rapid population growth at Phinda.

At least 47 lion cubs and 48 cheetah cubs were born during the study. Seventy-seven per cent of lion cubs and 63% of cheetah cubs reached independence during the study, and high rates of cub and sub-adult survival was a further factor contributing to rapid population growth. Increased cub survival (compared to other studied populations) was probably due to low density of established predators (conspecifics and competing species) and a high density of non-migratory prey. Population modelling suggested that low mortality rates for juveniles and sub-adults is a critical factor for rapid re-establishment.

Re-introduced lions and cheetahs foraged successfully following their release, and the post-release survival of reintroduced felids was clearly unaffected by their ability to acquire prey. Certain ungulates were preferred prey of cheetahs and lions, to the extent that some species experienced severe population declines as a result of predation. Wildebeest *Connochaetes gnou* were the most important species for lions and were killed at three times their availability, despite the greater abundance and availability of species such as nyalas *Tragelaphus angasi* and impalas *Aepyceros melampus*.

Predation by reintroduced lions on wildebeest resulted in a population decline of an estimated 30% during the study period. Similarly, cheetahs preyed upon reedbuck *Redunca arundinum* at eight times their availability at Phinda and reedbuck numbers declined by an estimated 53%.

Given its small size (180 km²) and total enclosure by electrified fencing, Phinda probably lacked predation-free refuges, so that preferred prey species were unable to migrate to areas of decreased predation pressure. The decline of wildebeest and reedbuck at Phinda prompted intensive population management (capture and removal) by the reserve's owners of cheetahs and especially lions, and is clearly one of the most pressing concerns of re-establishing predator-prey relationships in small, enclosed conservation areas.

The study of the Phinda lions and cheetahs is continuing. Other sites of large felid re-introduction in South Africa have been added to the project which aims to unify efforts to re-establish large carnivores in the region. Further information of the ongoing research can be accessed at:


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**The Wildcat in Israel**

by H. Mendelsohn*

The wildcat *Felis lybica tristrami* was formerly widespread in Palestine (now Israel and occupied territories). It inhabited different habitats, apart from sand dunes. The preferred habitat was Mediterranean scrubforest (macchia) on rocky slopes, but it occurred also in open habitats where it used deserted dens of other mammals (foxes, porcupines, etc.). It also occurred in man-made habitats such as citrus groves, and also in desert habitats.

At that time, in the 1930s, human population was low, about 1,500,000 (now about 7,500,000), and only in a few areas were there dense human settlements, mainly in the coastal plain and in the hills between Nablus and Hebron. Even there, wildcats were quite common.

With an increasing human population, more and more settlements were founded and in all of them domestic cats were, and are, kept. Domestic cats breed twice a year and rear, on average, four pups each litter. Because of the favourable climate and ample food supply from garbage, the survival of young domestic cats (even if not fed by humans), is very good. Large populations developed and many became feral, penetrating into outdoor and natural habitats occupied so far by wildcats. In competition with the wildcat, feral cats are superior. They are bigger and, therefore more successful in competition for living space, food and oestrous females.

Wildcats are territorial and live at densities of about one specimen per km². They breed once a year and rear, on average, three kittens, so are easily outnumbered by the more fertile feral cats that are more social and live at much higher densities than the wildcats. Domestic feral cats seem to be closer to *F. lybica*, from which they have been developed, rather than to the European
F. silvestris. Therefore, hybridization is widespread and pure-bred F. lybica tristrami have not been found for several years.

An additional factor has added to the extermination of F. lybica. This species has no resistance at all against feline distemper (Panleucopenia); captive-born kittens die within their first year if not vaccinated. Feral cats seem to acquire resistance early in life and can infect pure-bred wildcats.

If pure-bred F. l. tristrami do still survive anywhere in Israel, it can only be in as yet non-densely settled areas, as in some desert areas, the Jordan Valley or the Golan Heights. With increasing human and feral cat populations, they will also disappear from these areas – a lost conservation cause.

Because feral cats are able to live at high densities and because, contrary to wildcats, they hunt also during the day, they exert a much higher hunting pressure than wildcats and have a disastrous influence, not yet fully appreciated, on some forms of wildlife, mainly reptiles, ground and low-nesting birds and small mammals. One case concerns the local green lizard (Lacerta trilineata israelica), a quite big, somewhat sluggish lizard, that has lived until now in the preferred habitat of the wildcat. Because of the low density at which wildcats live and because they hunt only at night, both species could coexist in the same habitat. The day-active feral cats that live at high densities have exterminated this lizard in many areas.

Bibliography

Snow Leopards, Local People and Livestock Losses
by Rodney Jackson*

Livestock depredation is emerging as a significant issue across the Himalaya, including the Hemis National Park (HNP) in Ladakh. Some consider that this protected area harbors the best snow leopard population in India, but local herders perceive the endangered snow leopard as a serious threat to their livelihood.

A survey sponsored by the International Snow Leopard Trust (ISLT) found high rates of crop damage from blue sheep, and livestock depredation by snow leopard and wolf in nearly all of the 15 settlements of HNP. Interviews with village leaders, farmers and herders representing 79 households indicated that a total of 492 animals (with a market-value estimated at Rupees one million (US$2,300) were killed by predators between January 1998 and March 1999.

The worst case involved a snow leopard that entered a nighttime village corral and then killed 53 sheep and goats belonging to a single household. In 1996, the Ladakh Wildlife Department initiated a compensation program, but by late 1997 the number of claims filed exceeded the budget allocated and the Department was forced to suspend the program. Consequently, relations between wildlife officials and local people have also suffered, making management of this important protected area more difficult.

A People-Wildlife Planning Workshop was convened in Leh and the Markha valley of Hemis National Park in an attempt to seek alternative solutions to this vexing problem. Sponsored by ISLT, and with the collaboration of the Ladakh Ecological Development Group (LEDG), the objectives of the workshop were to:
1. Prepare an Action Plan assisting villagers and the local protected area authority (Jammu & Kashmir Wildlife Department) to identify cost-effective, sustainable and ecologically compatible means for reducing livestock losses, especially from snow leopard;
2. Train representatives from local NGOs and villagers in Appreciative Participatory Planning and Action techniques pertaining to applied People-Wildlife management; and
3. Increase understanding and awareness about people-wildlife relationships, in particular the importance of conserving snow leopards, their prey and habitat.


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Autumn 1999
The three-day introductory workshop session in Leh was attended by 26 representatives from non-governmental organisations, government and the general public. It highlighted the need to increase public awareness of snow leopard conservation and the importance of Hemis National Park as a significant repository of high-altitude trans-Himalayan biodiversity. Participants developed an Action Plan, using a special food-web poster and game, for implementation over the next year in local schools and villages by LEDeG, SECMOL, and Leh Nutrition Project (LNP) with ISLT providing training and materials.

This was followed by a 14-day session in Markha village, a hamlet of 26 households located in prime snow leopard habitat in Hemis National Park. It was attended by 14 persons (including resource specialists) from LEDeG, Leh Nutrition Project, Sheep Husbandry Department, Jammu and Kashmir Wildlife Department, Autonomous Hill Council, WWF-India, a University, The Mountain Institute (Nepal and Sikkim) and the International Snow Leopard Trust (India and USA).

The Mountain Institute provided workshop facilitation, using a highly participatory planning process known as Appreciative Participatory Planning and Action (APPA) which draws upon traditional Participatory Rural Appraisal (PRA) tools. APPA operates under the premise that the best results occur when local communities take a leadership role, focus on their opportunities rather than problems, and build on past successes. It is practiced through a four-step iterative process (4-D’s) which seeks to build consensus through:

1. discovering the community’s strengths and valued resources (Discovery);
2. envisioning short-term and long-term development scenarios if feasible resources were suitably mobilized and the community acted in concert (Dream);
3. designing an action plan for guiding change in ways that emphasize what the community can accomplish on its own while diminishing long-term dependence on outside financial and technical resources (Design); and
4. spurring participants to begin realistic community-improvement actions immediately, rather than waiting for external agents to act (Delivery).

Workshop participants were trained in each technique after which villagers participated in the sequential series of planning exercises, including resource mapping, seasonal agricultural activities, trend-lines, the delineation of depredation “hotspots” and ranking of pastures, sources of livestock mortality, indigenous livestock guarding methods and “good shepherding practices,” income sources and opportunities, and the nature of existing village institutions. These activities indicated that the greatest loss resulted from snow leopards killing livestock in the night-time corrals located in Markha’s winter pastures, and that the problem could be largely or entirely avoided by ensuring all corrals were predator-proof.

Using similar participatory tools, workshop participants and villagers then spent several days discussing, designing and refining a set of remedial measures to reduce depredation losses which:
1. met the funding conditions set by the donor (ISLT); and
2. achieved high design standards mutually agreeable to all parties, including the experts attending the workshop.

To receive donor support, the solution had to benefit both snow leopards and humans, involve a significant contribution (such as labor or materials) from the community, benefit all households, be monitored to ensure proper implementation, and have a designated party be responsible for maintaining any infrastructural improvement. The preferred solution had to comply with park regulations, be ecologically sound, socially responsible and cost-effective.

The participants concluded that the best solution involved the replacement of the four existing corrals with predator-proof structures constructed of stone and mortar with a wire-mesh roof. An Action Plan was prepared listing each of the activities to be undertaken, where, by whom, by when, along with an indicator(s) for measuring the effectiveness of the undertaking. An agreement was drawn up and signed specifying the conditions, roles and responsibilities of the signatory parties, namely ISLT and the leaders for each corral user group.

The Markha villagers agreed to provide all labor and on-site materials (stone and mud) required for corral improvement, while ISLT provided off-site materials (wire mesh, roofing poles, doors and related hardware) along with technical assistance and oversight. ISLT also agreed to provide mesh for predator-proofing corrals windows in Markha and Chalak, under the stipulation that the owners assume responsibility for strengthening the doors if required to prevent predators from entering the pen. Project activities will be implemented this winter and early spring, under an Memorandum of Understanding with the LNP (the most active local NGO in Hemis National Park) and supported by ISLT’s staff in India.

Workshop participants recommended that the APPA approach be applied in other settlements to reduce people-wildlife conflicts due to crop and livestock damage. Such participatory planning initiatives could be undertaken by a small team of 2-3 trained persons from local NGOs and government line agencies. Participants felt that this approach is especially helpful in strengthening local capacity for planning and development, and in making such interventions more effective, less costly and more sustainable. Finally, it was recommended that a community-based tourism training workshop be held in Ladakh in order to explore options for increasing trekking revenues for local people as a means of helping to offset livestock and crop losses.

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Implanting Transmitters in Neonatal Lynx

by John D. C. Linnell and Jon M. Arnemo

Collecting good quality scientific data on wild felids almost always requires the use of radio-telemetry. For adults, it is usually possible to attach a transmitter to a collar placed around the neck. However, for juveniles this is impossible due to the fact that they grow, and that expandable collars that generally work for neonatal ungulates are not practical for carnivores. Data on behaviour and survival of Eurasian lynx kittens prior to independence is a virtual blank, and was one of the priorities for our ongoing field project in Hedmark county, Norway (see related article in Cat News 30). Implanting radio-transmitters in the intra-peritoneal cavity is a standard technique for adults of species like otters or wolverines that present problems with collar attachment. The aim of this study was to test the method on neonatal lynx kittens.

Lynx kittens were located by closely tracking radio-collared female lynx back to their natal lairs. Kittens could then be grabbed by hand. After an initial test of the procedure on a nine-week old kitten in 1996, we used the procedure on all reproducing females in 1997 (six kittens in four litters) and 1998 (three kittens in two litters). For the latter two years, the operation was performed when the kittens were 4-5 weeks old and weighed between 900 g and 1.7 kg. At this age they were much easier to catch and handle. Two sizes of transmitters were used (7 g and 20 g), constructed by Telonics. Both transmitters had a 4-6 month battery life, with the larger model having a much stronger signal.

The operations were carried out in the field using standard procedures under a medetomidine-ketamine anaesthesia (contact Jon M. Arnemo for details). All operations were successful. After the operation the female lynx always returned to the kittens and immediately moved them some hundred meters to a new lair. All kittens survived for at least four months after the operation. Two kittens were recovered having died of parasite infestation, and four more were recaptured using dogs, all at around six months of age. In all cases the implants were examined and there was no indication of any problems associated with the procedure. We therefore conclude that implanting transmitters in neonatal lynx is a very effective, and acceptable, technique to collect data on this elusive stage of the life cycle.

Bibliography


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Using Genetic Tagging to Estimate Animal Population Parameters

by Garth Mowat, David Paetkau, Michael Proctor and Curtis Strobeck

Several recently developed genetic markers, most notably microsatellites, are sufficiently variable in most populations that a large amount of information can be gained about individuals by determining their genotype for a small number of these markers. In addition to being useful for studying genetic variation within and between populations per se, the analysis of such complex genotypes, or 'DNA fingerprints', has been combined with traditional statistical methods and novel tissue capture techniques to offer new possibilities for measuring population and behavioural parameters (Snow and Parker 1998; Taberlet et al. 1999).

This combination of techniques has been successfully used to study subjects like family relationships, group dynamics and individual movements (Packer et al. 1991; Amos et al. 1993; Morin et al. 1994a). For example, Pearce et al. (1996) used eggshell membranes and feathers to identify nesting female eiders and their young; they were able to non-invasively identify both the mother and chicks which occupied the nest and analyze nest fidelity of females by visiting the nest across multiple years. Taberlet et al. (1997) used DNA collected from hair and scat to identify most of the individuals in the Pyrenean brown bear population and document individual movement patterns.

Perhaps one of the most exciting recent developments has been the use of microsatellite genotypes as individual tags in the context of estimating population size or other parameters. Palsbøll et al. (1997) estimated the population size of the entire Atlantic humpback whale population using tissue samples collected from sloughed skin or biopsy darting and mark-recapture analysis. Kohn et al. (1998) estimated the size of the coyote population they studied using scat collection and mark-recapture analysis. Woods et al. (1999) used hair collection and mark-recapture analysis to estimate population size of grizzly bears for a large study area in southern Canada. The above methods offer new options for estimating population parameters for animal populations, they could be especially important for species in which parameter estimation has been particularly intractable, such as nocturnal species, marine mammals, and species living in dense forests.
How would a DNA based population inventory work?

DNA based inventories involve the combination of: 1) tissue collection in the field; 2) determining microsatellite genotypes to match samples to individuals; and 3) statistical analysis of the capture database to estimate the parameters of interest.

1. The field biologist must develop a method to obtain tissue samples from individuals in the population of interest. Remote, non-intrusive methods have obvious advantages and are possible for many species because DNA can be extracted from hair follicles, skin, feathers, and scat (Taberlet et al. 1999). A simple method that is highly efficient (i.e. removes a sample from most animals that approach the site) should allow field biologists to collect more samples than possible using standard live capture methods and facilitate a more rigorous sampling design resulting in greater accuracy and precision.

Taberlet and Bouvet (1992) first used hair collected in the field as a source of DNA to monitor brown bear numbers and movements (Taberlet et al. 1997). Palsboll et al. (1997) collected skin samples from humpback whales passively and using remote biopsy procedures during observation of whales. Woods et al. (1999) developed non-intrusive methods for pulling hair for inventories on bears. John Weaver (Wildlife Conservation International, Missoula, Montana, pers. comm.) developed rubber pads that have been used to remove facial hair from lynx, ocelot, and bears. Hair for genetic analysis has also been collected from martens and weasels using glue patches at bait sites (Foran et al. 1997a and b; Mowat et al. 1998); small mammals using two-sided tape (Raphael 1994); primates at their resting beds (Morin et al. 1994b; Gagneux et al. 1997); marmots, by plucking during live capture handling (Gossens et al. 1998). Scats have also been used to provide DNA samples for primates (Constable et al. 1995; Gerloff et al. 1995), ungulates (Flagstad et al. 1999), bears (Kohn et al. 1992; Wasser et al. 1997) and coyote (Kohn et al. 1998). Pearce et al. (1996) used eggshell membranes and feathers as a non-invasive source of DNA from eider nests.

2. DNA is usually extracted from tissue samples using chelex beads (Walsh et al. 1991) or QIAamp kits (QIAGEN Inc., Santa Cruz, California). Since the amount of DNA isolated from hair and scat samples is small, a specific, short region of DNA containing a particular microsatellite sequence (marker or loci) of interest is amplified through repeated thermal cycles of DNA synthesis using the polymerase chain reaction (PCR). Fluorescent dyes are incorporated during synthesis. The variation seen at such a loci is in the length (number of base pairs) of the microsatellite sequence. This length variation can be precisely measured using gel electrophoresis, in which DNA molecules are made to move through a gel matrix under the influence of an electric field. The rate at which individual DNA molecules move through the gel is determined by their length, and the fluorescent dye incorporated during PCR allows the location of the amplified molecules to be observed and recorded. The recorded genotype for a particular loci consists of two numbers describing the length of the maternally and paternally inherited copies of that microsatellite (alleles) in that individual. A more complex and informative, individual genotype is built up by performing this analysis on a series of microsatellite loci (usually 6-10). By using different fluorescent dyes, and loci with non-overlapping size ranges, many microsatellite loci can be analyzed in a single gel lane, greatly reducing the time, and hence cost, of the genetic analysis.

Once a genotype has been recorded for a given sample, probability statistics are used to test whether that genotype contains enough information (i.e. data from enough, sufficiently variable loci) to form a basis for individual recognition. Genotyped samples passing this test are then added to a database in which any two samples with the same genotype are deemed to be from the same individual (Woods et al. 1999). This database forms the capture dataset from the fieldwork. The sample population must demonstrate reasonable genetic variation in order to identify individuals; a pilot study may be necessary to determine genetic variation (Woods et al. 1999). Identification of individuals using microsatellite fingerprints may require analysis of a large number of loci for island populations making the method prohibitively expensive (Paetkau and Strobeck 1994; Paetkau et al. 1998).

The methods developed to PCR-amplify individual microsatellite markers normally work on a narrow range of closely related species. This means that an investment in marker development (microsatellite identification and "primer" development) is required in cases where they are not available for the study species. Marker development entails locating suitable DNA sequences (microsatellites) and development of primers — DNA sequences flanking the target DNA — that are ultimately used to locate and replicate the microsatellite during PCR. Even in species where markers are already available, it is worth putting considerable care into selecting a minimal set of maximally informative (variable) markers that can be analyzed as efficiently as possible in one gel lane. Here too, a pilot study is a good idea to ensure success and minimize DNA analysis costs. This set will not necessarily be identical for different populations of the same species. Straightforward analyses can also be developed to determine the sex or the species of individuals (Taberlet et al. 1993; Ennis and Gallagher 1994; Foran et al. 1997a; Woods et al. 1999).

3. The last component of the inventory is data analysis; the analysis method should be chosen before fieldwork is conducted because all analysis methods have sampling constraints which will affect the sampling design of the fieldwork. Most of the common mammal inventory methods could be applied to the type of capture and marking presented, such as census, sample surveys, line transect, and mark-recapture analysis. The simplest system possible is a census; however this method implies the capture of all, or nearly all, the individuals in a population which is rarely achievable in the field (Lancia et al. 1994). Boyce et al. (1999) present statistical methods that could be used to estimate the uncaptured proportion of the population in a census type of survey. The other sampling method used to date is closed mark-recapture modeling. Mark-recapture models make assumptions about the equality of capture probabilities among individuals and animal movements which requires tighter sampling criteria than a census. The design must strive to offer all residents an equal opportunity of capture (to minimize capture heterogeneity) and minimize the movement of individuals on and off the area during the census (to minimize closure bias; Otis et al. 1978; White et al. 1981; Rexstad and Burnham 1991). The benefit is that such lower levels of capture can be used to gen-
erate an estimate of population size. There is no assumption that all individuals in the population are captured. Open mark-recapture models are currently being investigated for use in monitoring population trend and estimating survival and recruitment. Open models require longer spacing among trapping sessions which probably means multi-year sampling for many larger species (Pollock 1990). We know of no examples where workers have combined genetic tagging and line transect population estimators. We do not rule out this application in the future, especially in combination with DNA sampling via scat or pellet collection or sampling sessile vertebrates such as nesting birds.

We have focused our attention on the use of closed population models because they are known to generate reliable estimates of population size given relatively low sampling effort. We are currently exploring the use of 2-3 sample session designs for bears, the shorter overall sampling period may reduce closure bias and would certainly reduce field costs in comparison to 4 or 5 session designs (Woods et al. 1999; Mowat and Strobeck 2000). Combining different types of tissue collections, such as hair and scat, is another future direction that may reduce capture heterogeneity and allow population estimation using as few as two trapping sessions.

We believe that many other possibilities exist for the application of genetic tagging to population analysis in wildlife conservation, and we expect to see many novel applications in the near future. This technology should allow the objective estimation of population size and other parameters, which includes estimates of precision, for species like felids which are notoriously difficult to count (Jackson 1999).

References
Gamete Recovery from a Namibian Cheetah

The death of an endangered animal is always a tragic loss, often made worse by the potential negative effect on an already depleted gene pool. Modern developments in reproductive science may have found a few solutions however and projects like Gamete Recovery International offer new hope, proving that the cycle of life is bigger than we thought.

The death of a wild cheetah recently in Namibia was such a tragic loss, as this young free-ranging male was in the prime of his life and represented a valuable source of genetic material, with a vital role to play in the maintenance of genetic diversity and therefore, the future survival of his species. But this cheetah's genetic legacy lives on today, due to a unique conservation project making use of exciting developments in reproductive technology and conservation biology.

Funded by Mondi Recycling, Gamete Recovery International (GRI) is a programme coordinated by the Wildlife Breeding Resource Centre (WBRC), a working group of the Endangered Wildlife Trust (EWT) in South Africa. Applying the latest developments in human and domestic animal reproduction to wildlife species, with a view to broadening gene pools and preventing extinction, the WBRC is developing methods of extracting viable genetic material (sperm and egg-cells) from recently dead animals.

The cheetah which died in Namibia in October represented the first transfer of viable reproductive material from a dead animal across South African borders and therefore, a breakthrough for this project. Less than 12 hours after the animal's death the material was processed by WBRC staff and 15 straws of sperm were frozen, each straw representing one dose needed to artificially inseminate a female. This material is now safely stored in the WBRC's gene bank and may one day result in the birth of cubs, fathered by an animal who died many years before.

The GRI programme was established in order to develop partnerships with zoos, breeding centres and other institutions who may gain access to material from wild animals which die. In this way, material from species like black and white rhino, cheetah, black-footed cat and a number of rare antelope species has been collected and processed. Once frozen, this material remains viable indefinitely and may be used for transfer back into a recipient of the same species at any time. Through this programme, the WBRC has also developed a DNA bank for wildlife, which houses material from over 35 wildlife species.

This particular event would not have happened but for the input of Bonnie Schoeman and Laurie Marker-Kraus of the Cheetah Conservation Fund (Namibia), Dr. Ulf Tubbesing (Namibia), DHL Namibia and Louise Watson at DHL South Africa, Mondi Recycling and WBRC staff (South Africa).

For more information on how to participate in this project please contact us:
- Website: <http://ewt.org.za/wbrc>
- Email: <mailto:wbrc@global.co.za>; <wbrc@global.co.za>
- Tel./fax: + 27 12 305 5840; + 27 82 990 3533/4

CAT News 31
New CITES Secretary General

Willem Wijnsteker, a Dutch environmentalist, has been appointed Secretary-General of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in succession to Izgrev Topkov from Bulgaria.

Wijnsteker, who was previously in the European Commission's Directorate General for Environment, Nuclear Safety and Civil Protection, has been actively involved with CITES for many years.

In a statement to the CITES Standing Committee in February, Wijnstekers said he was confident that he and the members could make CITES play a decisive role in the conservation and sustainable exploitation of natural resources in the next century.

"Together we must make CITES work for animals, for plants, and thus for people, and I should like to assure you of my total commitment to that objective."

He said he intended to re-establish the Secretariat as a "strong, professional and efficient entity". He said that time spent on unnecessary activities should be used for a higher quality of services to the Parties (governments members of the Convention). An important task was to guide the Parties, to initiate and take the lead on major policy issues. It should also be the "watchdog" of the Convention and become more effective in preventing undesirable effects and consequences of decisions of the Conference of the Parties and its committees. The number of recommendations had to be reduced in order to make those that really mattered better identifiable, understood and implemented.

Stating that Non-Governmental Organisations (NGOs) could do a lot of good or a lot of damage, he said they had reason to feel ignored. He intended to intensify the Secretariat's structural contracts with major international NGOs in all areas of interest to the Convention, but that did not mean that whatever NGOs said must influence CITES policy.

Wijnsteker said there would be greater transparency through a permanent, well-presented and accessible flow of information from the Secretariat to the Parties and others on activities and results.

The guiding principle for decisions should be that different Parties in different regions had different needs, interests and problems, which might require a different response, different mechanisms, tools and solutions, he declared.

CITES, which came into force in 1975 when 10 governments had ratified the treaty, now has 146 Parties. The web site is <www.cites.org>.

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**Studbooks**

**International Tiger Studbook 1998**

On 31 December 1997 the following tigers were held in the world’s captive facilities:

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<th>Species</th>
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<th>Male</th>
<th>Female</th>
<th>Facilities</th>
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<td>(122)</td>
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<td>(31)</td>
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**International Caracal Studbook**

On 31 December 1998, the following caracals were held in captive facilities:

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<th>No.</th>
<th>Male</th>
<th>Female</th>
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El Lince Ibérico
Photos:
Antonio Sabater Artús
Text:
Miguel Delibes de Castro y Francesco Palomares Fernández

A Last Chance for the Iberian Lynx?
by Guy Beaufroy
WWF Report, November 1999
WWF UK
Godalming, Surrey GU7 1XR, UK
7 pp.

The Iberian lynx Lynx pardinus is only slightly more than half the size of the Eurasian lynx, comparable with the American bobcat L. rufus and the Canada lynx L. canadensis. It is found only in Spain and Portugal, and is the wild cat most threatened with extinction. In recent decades the South American pox virus Myxomatosis and Viral Haemorrhagic Fever caused a crash in the population of rabbits, the lynx’s main prey. At the same time, conversion of habitat to human use fragmented lynx populations, so that most groups are not considered to be all viable and are doomed to extinction. Latest estimates suggest that only 600 lynx may survive, confined to the southwestern quadrant of the Iberian peninsula.

In “El Lince Ibérico” leading lynx researchers, Miguel Delibes de Castro and Francesco Palomares Fernández tell the sad story, with some of the finest published photos of the lynx, taken by Antonio Sabater Artús.

Many of the pictures were taken in the Doñana National Park, on the Atlantic coast, south of Seville, where, only a few days before writing this review, I had the good fortune to see two of the park’s 50 lynx, one of them lying tranquilly in the sunshine beside the carcass of a fallow deer Cervus dama, an unusually large prey. Doñana, one of Europe’s finest reserves, is also renowned for its red deer C. elaphus, wild boar Sus scrofa, the rare Spanish Imperial eagle Aquila heliaca adalberti, and its rich wetlands, which are havens for migratory and resident birds, still has about 50 wild lynx. The rabbit population has been recovering, being boosted by introductions in various parts of lynx habitat.

After failures in the past few years, a new effort is beginning to breed lynx at a special captive facility in the Doñana.

The World Wide Fund for Nature (WWF), along with other conservationists and scientists, has been pinning its hopes on a European Union scheme, Natura 2000, in which a network of conservation areas is to be set up in Spain to protect and boost the lynx’s precarious population. But, at the same time, WWF has serious concerns, which are summarized in the following book review.

It is to be hoped that “El Lince Ibérico”, with its dramatic pictures of the lynx, will awaken public concern about the survival of the lynx.

Peter Jackson

The Iberian lynx features prominently in the WWF campaign for Europe’s large carnivores. This booklet, written by Guy Beaufroy, provides a useful summary about the status of the lynx, reasons for decline, and the challenge of conservation.

In the second half of the booklet, when conservation measures are discussed, the introduction states: “As the country that harbours 95% of the total Iberian lynx population, Spain has a special responsibility for the conservation of this endemic European species. Sadly, the efforts of the authorities have until now been completely inadequate, and have served merely to illustrate the critical situation in which the lynx finds itself.”

After reviewing the situation in the past five years, Guy Beaufroy describes the European Union’s Natura 2000 programme and Habitats Directive before expressing serious concern about the actions proposed by the Spanish government. While expressing “cautious optimism” about the proposed establishment of a large network of protected areas for the lynx, he declares that there is concern about implementation and effectiveness.

Beaufroy states that the protected areas proposed for the lynx are not sufficient to enable the lynx to be restored to a favourable conservation status. The proposed reserves and the areas which WWF says should be included are shown on a map. Some of the proposed reserves are said to be threatened by road and dam building projects, inappropriate land management, forest tracts and deer fencing. WWF Spain has pointed out that the already fragmented network of areas used by the lynx would be broken into 20 more places if the plans go ahead. Legal requirements are said not to be met.

In conclusion, Beaufroy declares that it is essential that lynx conservation be taken into account in the design and implementation of government policies for rural and regional development, which, at present, are often in conflict with conservation of the lynx and other endangered species. He points out that important opportunities are available to the Spanish and Portuguese authorities to build “ambitious conservation measures for the Iberian lynx in their programmes for spending under the EU Structural Funds in the period 2000-2006”.

Peter Jackson
La Lince Eurasiatica in Trentino
by Bernardino Ragni
Provincia Autonoma de Trento - Servizio Parchi e foreste demaniali
ISBN 88-7702-074-1
In Italian with English summary
152 pp.

A century ago the Eurasian lynx Lynx lynx had been extirpated in Western Europe, except Scandinavia, and prey animals, such as roe deer Capreolus capreolus and chamois Rupicapra rupicapra were vanishing. The ungulates were brought back during the 20th century and, in the 1970s, serious efforts began to reintroduce with lynx, mainly with specimens from the Carpathian mountains in Slovakia. Scientists are still unsure of the level of success, for releases in most areas have not reestablished viable populations, with Switzerland and Slovenia the exceptions.

In this book, Bernardino Ragni tells how the lynx from reintroduced populations in Austria and Slovenia have recolonized the province of Trentino in the central-eastern part of the Italian Alps. Ragni and his team have been studying the ecology of the lynx, its biology and behaviour, and report their findings.

The book is illustrated with photos of the Alpine habitat of the lynx, prey animals, and sign, such as scats and footprints. There are many maps and diagrams to support the text.

Peter Jackson

Asiatic Lion: On The Brink
by Asheen Srivastav and Suvira Srivastav
Bishen Singh Mahendra Pal Singh Dehra Dun 248 001, India.
<bsmps@del2.vsnl.net.in>; <www.bishensinghbooks.com>
ISBN 81-211-0173-5
247 pp.

A century ago the Asiatic lion Panthera leo persica was on the way out in India. Hunting by Indian princes and British colonialists had reduced the population to 100 or less - some estimates were as low as a dozen - confined to the Gir Forest in Saurashtra. Only scattered individuals remained in Iraq and Iran out of its former vast range, stretching from Macedonia in the time of the Ancient Greeks to northern India. Although sightings were reported in Iran in the 1940s, there is no indication now of survival of Asiatic lions outside the Gir region.

The lions in the Gir owe their survival to the local ruler, the Nawab of Junagadh, who, with encouragement from the then British Viceroy, Viscount Curzon, stopped the hunting expeditions so popular with princes and officials. There are now about 300 lions, and they have re-occupied several old territories outside the Gir Lion Sanctuary, including beach areas washed by the Arabian Sea.

Asheen Srivastav of the Indian Forest Service spent many years in the Gir management team and he and his wife, Suvira, were deeply interested in the lions. Their book combines extensive material on the history of the lions in the Gir, and their behaviour, with information on the people of the Gir, such as the Maldhari graziers, whose cattle and buffaloes form a large part of the lions' diet. The human pressures on the Gir, which include major roads and a railway passing through its heart and the numerous Hindu temples which attract tens of thousands of pilgrims are well reviewed. Efforts to reduce these pressures, including ecodvelopment of the surrounding region to minimize people's dependence on the forest, are discussed in detail, and the importance of working with, not against, the local people is stressed.

Drawing on the literature, the authors reproduce many fascinating anecdotes about the lions and the people.

The book has an extensive bibliography, but, unfortunately, it lacks an index, which is highly desirable in order to facilitate access to the mine of information it contains.

Peter Jackson

Snow Leopard in Nepal
by Susan K. Gundersen
WWF Nepal Programme, Dept of National Parks and Wildlife Conservation and International Snow Leopard Trust
Email: <isl@serv.net>
20 pp.

Inhabiting the high arid lands of central Asia, the snow leopard has its southernmost range in the Himalayas of Nepal, India, Bhutan and Pakistan. This booklet deals with the situation in Nepal, where WWF Nepal Programme, Dept of National Parks and Wildlife Conservation and the International Snow Leopard Trust have been working together to conserve this charismatic cat.

After describing the physical features of the snow leopard, its distribution and status and potential habitat and distribution in Nepal, Gundersen deals with home range, prey and behaviour. Then she focusses on the threats to the survival of the snow leopard. The primary threats are poaching, loss of prey, retaliation by farmers whose stock is attacked, loss of habitat, and lack of awareness and support for conservation from villagers and herders. All sections are succinctly presented.

The booklet is well illustrated with black and white photos and sketches.

Peter Jackson
The Mammalian of China
by Sheng Helin, Noriyuki Ohtaishi and Lu Houji
China Forestry Publishingt House
Beijing, China 100009
<cfphz@public.bta.net.cn>
ISBN 7-5938 2072-1
298 pp

China’s mammalian fauna comprises 534 species, about 12.5% of the world total described. It includes 12 wild cats, second only to India with 15. This pocket-sized book contains 193 species, representing families, with colour photos of each. There is a colour distribution map to go with each summary account, which includes scientific and English names, classification, characteristics, habitats, reproduction, distribution and conservation status. Fifteen other species are included without photos, while the remaining species are listed by their scientific names.

Authors Sheng Helin and Lu Houji are Professors at the East China Normal University in Shanghai, and Noriyuki Ohtaishi is a Professor at Hokkaido University in Japan.

Peter Jackson

The valuable reference book is available from the UK-based Natural History Book Service
Email: <nhbs@nhbs.com>; <www.nhbs.com>; Fax +44 1803 865 913; price £36.50.

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Wild Cat-related Meetings in 2000

January 18-20  Global Tiger Forum, Dhaka, Bangladesh. The first meeting of the GTF, an inter-governmental organisation, outside India. Organised by the GTF Secretariat, c/o Ministry of Environment and Forests, New Delhi, and Government of Bangladesh

February 4-6  Endangered Cats of North America workshop, Jacksonville, TX, USA. Organised by the National Wildlife Federation

February 5-10  Arabian Carnivore Conservation Assessment and Management Plan workshop, Sharjah, UAE. Organised by the Environment and Protected Areas Authority of Sharjah and the Breeding Centre for Endangered Arabian Wildlife, Sharjah

April 6-9  International Symposium on Wildcats (Felis silvestris), Nienover, Germany. Organised by Karsten Hupe, Institut für Wildbiologie und Jagdkunde, University of Göttingen and Bärbel Pott-Dörfer, Niedersächsisches Landesamt für Okologie, Hildesheim, Germany

April 10-20  CITES Conference of the Parties 11, Nairobi, Kenya

April 14-16  American Zoo and Aquarium Association’s Feld Taxon Advisory Group, Columbia SC, USA

October 4-11  World Conservation Congress (IUCN General Assembly), Amman, Jordan

Indian wildlife has lost its best protector. Forest officers all across India mourn the death (on 16 August) of one of their finest. Sanjoy Deb Roy, or Dada as he was called, started his forest service in Assam in 1956 and served as the Director of Manas National Park and Tiger Reserve for 18 years, followed by three years as Director of Kaziranga National Park. He piloted Manas to international fame and was directly responsible for it becoming a Unesco World Heritage Site.

In the late 1980s he became Assam’s Chief Conservator of Forests and Chief Wildlife Warden for a period of four years. When Maneka Gandhi was appointed Minister of Environment and Forests she asked him to join the Ministry as Additional Inspector-General of Forests (Wildlife). He retired in 1992.

Dada also served nearly all the Advisory bodies and committees on wildlife in the Ministry of Environment and Forests. His reservoir of knowledge of Indian ecology was phenomenal and he was also a member of four specialist groups of the World Conservation Union (IUCN).

Blunt, honest, tough talking and severe in his criticism, his interventions for the cause of wildlife can never be forgotten by anyone. He was recognised frequently for his service to wildlife and received the National Award for Management of Manas Tiger Reserve in 1982. He also received the internationally-prestigious Borlaug Award for his outstanding contribution to the protection of flora and fauna in Assam.

For the last seven years Dada was deeply involved with Non-Governmental Organisations and was closely associated with the Corbett Foundation and the Ranthambhore Foundation. I got to know him in his last year in office when we happened to travel together to a wildlife conference in Caracas, Venezuela. It was from him that I had my first lessons in absorbing the complicated and intricate machinery of wildlife governance and we worked closely together on many interventions and strategies.

He had created and strongly believed in eco-development as a strategy to harness the strengths of traditional forest people for conservation, but after his retirement this entire concept of eco-development became his greatest anguish. He was tortured by its abuse, and warned of the severest consequences because it had quickly become a “developmental tool” in the hands of donors like the World Bank. He could not believe that some of his fellow forest officers had failed to understand the deeper meaning of this concept. He feared that the way this project progressed could be fatal for our protected areas. I remember how his eyes would get furious about the misapplication of the concept and his own helplessness to correct it. In a way he felt responsible for its creation and frustrated at its application - he feared it would end up triggering market forces and rampant consumerism, both of which he abhorred.

In the 1990s, Dada grew to hate the city, especially Delhi and the corridors of the Ministry of Environment and Forests. He was in essence a man of the forest and completely at home in it. From 1993 to 1998, I travelled with him to Nagarhole, Sariska, Palamau, Ranthambhore, Panna, Kanha, Pench, Corbett and, of course, Kaziranga and Manas - trips that I will never forget.

He was most comfortable with those whom he called the true protectors of wildlife: forest guards and the daily wage employees. We would sit talking into the early hours of the morning and through these frequent field visits we absorbed the grim reality that faced the wildlife of India. My best trips with him were in the superb wildernesses of Manas and Kaziranga and I learnt of his enormous field knowledge. He was a great believer in self-sufficiency in the forest and his favourite food was that which the forest provided. In Assam, on several occasions we sat with forest guards at their posts feasting on the grandest of buffets of bamboo shoots, cane and such a variety of vegetarian delicacies that I was astonished. These were some of the best moments I spent with him. Wherever we went most forest staff were totally devoted to him. He was their leader who throughout his life had fought their battles.

“I remember while we sat looking at the Manas river he regaled me with a tale of how he had once gone to sleep beside a fire at night in Manas and when he woke up some hours later he saw, also asleep and only 20 feet away, a tiger enjoying the warmth of the fire.”

His battles at Manas are still legendary as he would lead his men into confrontations with armed poachers. On many occasions bullets whizzed around, and firing at poachers was a fact of life for him and his staff at Manas. As the breeze hissed passed us across the river he turned to me and said: “How many lives of forest guards have been sacrificed for Manas - is it worth it? Will this ignorant government realise the importance of this unique natural treasure?” I was silenced as we watched the light fade across the Manas river.

It was together that we obtained for the first time in Assam more than nine vehicles for wildlife - boats, and so much more - so that the true trench soldiers of wildlife had the necessary infrastructure and support to ensure the future of wildlife in Assam. Debates, arguments, discussions and so many strategies were part of our lives in the 1990s as we strove to defeat those that damaged the wilderness. But in the last two years Deb Roy gave up hope. He had watched his beloved Manas bleed to death and saw the horrors that confronted so many wilderness areas. He knew that time was running out and the future of wildlife was hopeless - wildlife being caught at the centre of a vicious nexus between politicians and bureaucrats who couldn’t care less. What kept him going was his faith in the Bhagavad Gita (Hindu holy book) and his experience of the power and beauty of nature.

The tragic loss of Dada has sent shock waves across conservation groups and people in India and all over the world. Sanjoy Deb Roy will be remembered for his more than 40 years of selfless, committed and dedicated service to this nation’s natural heritage. His greatest sadness before he died was to witness the explosion of militancy in the World Heritage site of Manas. He wished on his death that some of his ashes be immersed in the Manas river that he loved, a wish that was granted.

Today Government officers and conservationists alike must pledge in his memory to restore Manas to its original glory. This will be the best way to remember and honour Dada.

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Cats on the Web

Cat Specialist Group: http://lynx.uio.no/cattalk
provides species accounts from the book Wild Cats: Status Survey and Conservation Action Plan, compiled and edited by Kristin Nowell and Peter Jackson (IUCN 1996), newsletter Cat News, and other information about the group. The site is still being developed to provide much more information.

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

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

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

CITES: http://www.cites.org
The Convention on International Trade in Endangered Species of Wild Fauna and Flora

World Conservation Monitoring Centre: http://wcmc.org.uk
provides access to databases on species and protected areas

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

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

Help Save the Tiger: http://chitwan.gis.umn.edu/tiger/tigindex.html
provides GIS maps of tiger distribution in south and south-east Asia, as well as information on on-going research activities

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

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

Big Cat Sites: http://www.bigcats.com/bigcats/index.html
provides links to a wide range of cat sites

International Snow Leopard Trust: http://www.snowleopard.org/islt
covers the widespread activities of the Trust. Of particular interest is the related page on satellite tracking of snow leopards in Mongolia. http://detox.mesc.nbs.gov.80/snow-leopard/mslm.html

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

Asiatic Lion Information Centre: http://wkweb4.cableinet.co.uk/alic/

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

Cheetah Conservation Fund: http://www.cheetah.org
Namibia-based, the CCF covers cheetahs worldwide.

AfriCat: http://www.AfriCat.org
Namibia-based, AfriCat covers cheetahs and leopards in Namibia

Projeto Puma: http://www.portadig.com.br/puma
reports on puma predation on livestock in southeastern Brazil

reports on studies of the kodkod in southern Chile

African-Arabian Wildlife Research Centre: http://info.simplenet.com/AAWRC
is the home page of Chris and Tilde Stuart, leading field workers in Africa and Arabia

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

Mountain Lion Foundation: http://mountainlion.org

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

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

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

Natural History Book Service: http://www.nhbs.co.uk
is an excellent book service for all interested in natural history.
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Cover: Clouded leopard Neofelis nebulosa, Khao Yai, National Park, Thailand
Photo: Sean Austin (see page 17)

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