

CAT

Special Issue

N° 12 | Autumn 2018

news

World Wildlife Day 2018



This Cat News Special Issue is dedicated to the memory of

Bradnee Chambers

1966–2019

Executive Secretary of CMS

02



CATnews is the newsletter of the Cat Specialist Group, a component of the Species Survival Commission SSC of the International Union for Conservation of Nature (IUCN). It is published twice a year, and is available to members and the Friends of the Cat Group.

For joining the Friends of the Cat Group please contact Christine Breitenmoser at ch.breitenmoser@kora.ch

Original contributions and short notes about wild cats are welcome
Send contributions and observations to ch.breitenmoser@kora.ch.

Guidelines for authors are available at www.catsg.org/catnews

The **Symposium** for the World Wildlife Day 2018 and the production of this **Special Issue of CATnews** have been supported by the Federal Office for the Environment, Innflow AG and Kongress + Kursaal Bern AG.

Design: barbara surber, werk'sdesign gmbh
Layout: Malini Pittet and Tabea Lanz

ISSN 1027-2992 © IUCN/SSC Cat Specialist Group

The designation of the geographical entities in this publication, and the representation of the material, do not imply the expression of any opinion whatsoever on the part of the IUCN concerning the legal status of any country, territory, or area, or its authorities, or concerning the delimitation of its frontiers or boundaries.

Editors: Christine & Urs Breitenmoser
Co-chairs IUCN/SSC
Cat Specialist Group
KORA, Thunstrasse 31, 3074 Muri,
Switzerland
Tel ++41(31) 951 90 20
Fax ++41(31) 951 90 40
<urs.breitenmoser@vetsuisse.unibe.ch>
<ch.breitenmoser@kora.ch>

Cover Photo: Tiger in Bern
Photo Malini Pittet

CLAUDE MARTIN

Introduction to the World Wildlife Day 2018



Claude Martin began his career with an MSc and PhD in Zoology from the University of Zurich. He then served as the Director General for WWF International between 1993 and 2005 following which he took up the position of Vice-Chair for the International Institute for Sustainable Development from 2006 to 2013. He is the author of the Club of Rome 2015 report: "On the Edge: the State and Fate of the World's Tropical Rainforests."



M. Pittet

The third of March was the World Wildlife Day 2018, a day which saw events taking place around the world in over 80 locations. This year, the day was devoted to big cats, predators under threat. As powerful as big cats may appear, today many of them are threatened by extinction and with them their crucial regulatory function in ecosystems. These large predators are in danger because somehow the evolution did not quite reckon with the absurdity and the greed of a single super predator. Among the threats that this super predator, man, inflicts on cats and other wildlife include habitat loss, poaching, poisoning, illegal wildlife trade, climate change and other direct threats. But although the focus of this day is on big cats, it is important to have a brief look at the bottom of the food chain into the world of insects.

Last year, the entomological society of Krefeld in Germany found that over the past 30 years, across Germany, and even in protected areas, the biomass of flying insects dropped by three quarters (75%). The publication of these results, came as a shocking confirmation of what people in all parts of Europe and in other parts of the world call "the windshield phenomenon", since a number of years we do not have to scratch dead insects from car windshields anymore. Where have they all gone? One may be concerned about the fate of bees and butterflies, but the long-term study from Krefeld documented that all flying insect orders are affected. Some of the worst off are the hoverflies. Equally important pollinators, their biomass has dropped by 85%. Such dramatic losses undoubtedly reverberate up the food chain, impacting bird, small mammal populations and even herbivores. In 2017, researchers from the University of Neuchatel published a paper in Science

based on an analysis of 200 honey samples from all over the world. They found traces of neonicotinoids in 75% of the samples. Neonicotinoids are now the most widely used insecticides in agriculture around the world. And while they do not pose a health problem for humans, they are very likely to severely harm insect populations globally. More than half a century after Rachel Carson's book "Silent Spring" it would appear that human beings have not learnt much or simply do not care.

It may be strange to open this Wildlife Symposium focused on large cats by talking about insects but after all, the legendary ecologist Edward O. Wilson said about insects "they are the little things that run the world". As we celebrate World Wildlife Day we should recognise that human kind is about to unravel ecosystems and even entire biomes. Ultimately, this will damage

those magnificent top predators as well. Therefore we must also look at the more insidious threats to ecosystem integrity, beyond the direct threats to the predators' survival. In a time with so much uncertainty where the essence of life on this planet gets sacrificed to consumerism and the free market economy, it is of utmost importance that we learn and hear about the fate of wildlife from the invertebrates up the food chain to the predators. This requires more scientists, more research, better communications skills and communicators to carry these messages out to the broad public and those that are responsible for decisions affecting all life on Earth.

It is with this perspective that I would like to express our gratitude to the organisers and the speakers for their momentous contributions, and welcome all participants to this important and timely symposium.



M. Pittet



LUKE HUNTER

Priorities for conserving the African lion



Luke Hunter obtained his PhD on lion and cheetah population recovery from the University of Pretoria in 1998. He subsequently headed the Wildlife Conservation Society's Great Cats Program. Since 2008, Luke has been the President and Chief Conservation Officer of Panthera where he oversees the planning and execution of field programmes around the globe, and supervises the scientific priorities of Panthera's work. He has written extensively about wild cats and their conservation, publishing 8 books and more than 175 articles in scientific journals and popular media.

The liability of sociality

The lion is famously the only felid that forms large, permanent social groups, centred on a matriline comprising up to 20 (but typically 3–6) related lionesses that communally defend a territory and raise cubs. Each pride usually has a coalition of 1–9 (generally 2–4) adult males that typically immigrate from other prides and are unrelated to the breeding females. This sociality produces an enduring pride structure that, in exceptional circumstances, may number up to 50 members including cubs.

From a purely scientific perspective, the lion's social system is a valuable asset for researchers interested in the intersection between behaviour and ecology; many elegant and fascinating papers have been written on the social lion, and indeed the species is one of the most studied of all Carnivora. Yet from the conservationist's perspective, the social lifestyle of the lion represents a uniquely vexing challenge. More so than any other carnivore species on earth, the lion is dependent on abundant, medium-to-large bodied herbivores. Compounding this requirement, the species is now almost entirely restricted to woodland-savannah habitats in Africa (a single population of lions lives outside Africa, in India's Gujarat State); the same habitats host a human population that is both the fastest-growing and most heavily reliant on livestock of any continent's. This combination of biological and human factors unite to make the lion an especially problematic species to conserve in the 21st Century.

Is the lion Vulnerable or Endangered?

Lions have declined for the same reasons that have provoked declines of large carnivores everywhere in which, historically, the conversion of habitat to support human populations has been the primary driver. Loss of habitat continues to be an underlying threat to lions, although there is now broad consensus that two additional threats are chiefly responsible for ongoing declines:

1. Indiscriminate anthropogenic persecution i.e. retaliatory and pre-emptive killing to protect human life and especially livestock. In general, this threat is most prevalent outside protected areas and especially on their boundaries where pastoralist communities are often concentrated. Although lions are protected throughout their range, enforcement against illegal killing by pastoralists is largely non-existent in most range states.
2. Depletion of the lion's wild prey base. Based on a questionnaire of practitioners associated with 186 protected areas, prey base depletion due to bushmeat poaching is regarded as the most serious threat to lions in protected areas across Africa. Bushmeat poaching contributes to low conservation effectiveness of a majority of parks with lions; less than one third of protected areas sampled for the study conserve lions at $\geq 50\%$ of their estimated carrying capacity, and around 42% of protected areas conserve lion prey species at $\geq 50\%$ of their estimated carrying capacity.

Although the lion reaches high densities in well-protected productive habitat, the species has undergone a massive range collapse. In Africa, it occurs unequivocally in only $< 8\%$ of its original range; including poorly-known

areas where its continued presence is uncertain, the most optimistic estimate is that it may occur in 16.3% of historic range.

The total population of the species is estimated to have declined 43% between 1993 and 2014, but this conceals a more severe decline across most of the range. Five countries (Botswana, India, Namibia, South Africa and Zimbabwe) comprising around 25% of the total population have stable/nearly stable or increasing populations which are collectively estimated to have increased 12% since 1993. These increases in a relatively small part of the range disguise the severity of the decline elsewhere in the African range, representing 75% of the population: this decline is collectively estimated at 60% since 1993. Accordingly, although the lion is classified as Vulnerable on the IUCN Red List, it qualifies to be considered Endangered in most of its range (by the A2 criterion, with an inferred rate of decline over 50% in three generations).

Two main priorities for conserving the lion

Securing protected areas and reducing conflict-related killings are recognised as the two most impactful priorities in reversing the decline of lion populations. A wide variety of additional activities have a role to play in fostering recovery, chief among them, addressing unsustainable trophy hunting practises in countries where lion hunting is legal. However, such ancillary interventions may fail or at best produce only very modest conservation outcomes unless the pervasive illegal killing of lions and their prey is addressed on a large spatial scale.

Resolving retaliatory killing

Of the many activities engaged in by conservationists focused on lions, resolving conflict between livestock owners and lions has received the greatest attention by the non-profit sector. While the scope of interventions varies with the cultural context, all projects include the improvement of night corrals as a mainstay. Variations on this theme include reinforcing existing corrals with locally-available Acacia thorn-trees (e.g. Lion Guardians, Kenya), creating impenetrable 'living fences' of cultivated species such as *Commiphora africana* (Niassa Carnivore Project, Mozambique; African People and Wildlife Fund, Tanzania) or building entirely new corrals with modern materials such as Eucalyptus poles and chain-link fencing (Kwando Carnivore Project/Panthera, Namibia). These improve-



Fig 1. The ecological and economic potential of parks. The estimates for growth show the approximate increases in respective wildlife populations of Kafue NP, Zambia, if the park’s potential carrying capacity was realised. The main limitation to that recovery is currently wide-spread poaching of ungulates and carnivores, including lions, inside the national park. *Tourism revenue estimates from Martin 2011 (Report to ZAWA, Lusaka).

ments must be associated with diligent herding practises that ensure livestock is corralled at night; and they further rely on livestock owners being able to respond rapidly when lions (or other carnivores) appear at corrals as, left alone, lions will eventually find their way into even the most robust corrals.

Provided these criteria are met, enclosures are one of the most effective mechanisms to reduce predation by lions (this applies widely to other carnivores around the world). Where applied in concert with ongoing education and support (for example, in employing community members to maintain corrals, accompany livestock and monitor lions), the conservation outcomes are convincing. In northern Namibia’s Zambezi region, lions killed 135 livestock in 2013 in communal lands near Nkasa Rupara National Park, and at least 21 lions were killed by people in retaliation. Between 2014 and 2016, the Kwando Carnivore Project and Panthera built 71 large corrals with communities in the most afflicted regions, reducing both the number of livestock killed at night by lions, and the number of lions killed by people to zero in 2016.

Importantly, enclosures are not a universal panacea, for example, in much of West and Central Africa where semi-nomadic herding practises preclude their effectiveness, at least seasonally. Additionally the issue of day-time predation while livestock is out in the field

grazing remains a challenge everywhere that lions occur in pastoral landscapes. Promising field trials with mobile corrals made of canvas currently underway in Namibia and Zimbabwe may help to resolve both issues (see softfootalliance.org/mobile-boma/).

Securing protected areas

All remaining lion populations occur only in protected areas PAs or are associated with PAs areas yet the effectiveness of African PAs is undermined by very significant funding deficits. It has been recently calculated that the minimum funding required for the effective conservation of African lions is a total of \$1.2–2.4 billion annually for the 282 PAs included in the study. However, those PAs receive only \$ 381 million annually, leading to a deficits totalling \$ 0.9–2.1 billion. 88–94% of all PAs with lions are currently regarded as insufficiently funded.

The relatively recent emergence of long-term partnerships between conservation NGOs and African statutory wildlife authorities is helping to address this shortfall. Such public-private partnerships PPPs are focused on improving the overall management capacity of protected areas and take a variety of forms in which improving park security and curtailing illegal hunting is typically a high priority. Historically, these partnerships are not especially focused on individual species such as lions nor have they been a priority

for lion-focused conservationists. However, numerous examples of parks where PPPs are being implemented have produced notable recoveries of wildlife including actual or potential recovery of lions. Prominent examples include Gonarezhou (Zimbabwe), Yankari (Nigeria) and Zakouma (Chad) achieved via partnerships between those countries’ wildlife authorities and NGOs such as Frankfurt Zoological Society, the Wildlife Conservation Society and African Parks respectively.

PPPs represent an important opportunity for the lion-conservation community. Lion status is a useful proxy for overall health of PAs, and the species acts as an iconic umbrella for attracting investment that, when properly directed, has benefits that go well beyond stabilising or increasing lion numbers. Panthera works in Kafue NP in Zambia with the Department of National Parks and Wildlife (DNPW; formerly ZAWA) where wildlife populations are significantly depleted as a result of pervasive bushmeat hunting. Addressing that issue by supplementing the anti-poaching capacity of DNPW personnel would produce significant recoveries in wildlife populations across the board (Fig 1). Additionally, if Kafue’s wildlife populations were at capacity, their tourism potential has been estimated at almost 20 times their current value, USD\$39M compared to \$2M. Well-managed protected areas can act as massive engines for both ecological and economic recovery but the wildlife populations of many of them are rapidly approaching the point at which those dual opportunities will be permanently lost.

Conclusion

The recent decline of the lion is one of the most rapid and thoroughly documented of all carnivore species. The pattern of decline continues in the majority of the species’ range, and will inevitably lead to further losses in range and population without determined conservation action on a very large spatial scale. Although the obstacles to success cannot be trivialised, there is broad consensus on the most important threats to the species and the principal solutions as outlined here. With the apparent recent escalation of a targeted international trade in lion parts, the urgent need for these actions will only increase.

References available as Supporting Online Material at www.catsg.org.

JUAN CARLOS VASQUEZ

CITES Introduction to WWD



Mr Vasquez is a Colombian/Swiss lawyer with post-graduate studies at the University of Geneva. Actually, he is the Chief of the Legal Affairs and Compliance Unit in the Secretariat of the Convention on International Trade in Endangered Species of Wild Fauna and Flora CITES. Mr Vasquez ties to the CITES Secretariat back to 1997. He has been responsible for legal affairs, outreach, fundraising, private sector engagement, livelihoods, rural communities and partnerships.

On 3rd of March 2013, exactly five years ago, the 16th meeting of the Conference of Parties (CoP16) to CITES opened in Bangkok, Thailand. The host country submitted at CoP16 a draft resolution to start celebrating a World Wildlife Day WWD; the Thai proposal was adopted by consensus. The same day Switzerland hosted an evening reception at the embassy to celebrate the proclamation of the WWD and the 40th birthday of CITES.

On the 20th of December 2013, the UN General Assembly proclaimed the 3rd of March as the UN World Wildlife Day to celebrate and raise awareness of the world's wild animals and plants. The UN resolution also designated the CITES Secretariat as the facilitator for the global observance of this special day for wildlife. Five years later, World Wildlife Day has become the most important global annual celebration dedicated to wildlife.

The first celebration of the World Wildlife Day was organised in Geneva in March 2014 with the attendance of UNSG Ban Ki Moon, Mr. Didier Burkhalter, the then president of the Swiss Confederation, the president of the UN General Assembly and representatives from several governments, NGO's, Yann Arthus Bertrand, and many more. The success of this first wildlife celebration was due to the existence of a collective will and a collective effort; no egos, zero budget, only passion. Because in CITES we think that ideas are stronger than money. The World Wildlife Day is more than a celebration, it is a movement and an invitation to join forces and work together on concrete, pragmatic, targeted solutions, action in the field, applying science for more evidence-based policies.

This is how we started the campaign on getting serious about wildlife crime.

CITES was signed in Washington DC in 1973, right in the middle of the Cold War with the US, the Soviet Union, 80 other nations, the IUCN, the GATT, the World Customs Council sitting around the same table. The adoption of CITES in such context means something: it means that wildlife unites people.

This is why the preamble of CITES recognises that peoples (mentioned first in the preamble) and States should be the best protectors of their own wild fauna and flora.

CITES is a hybrid animal that combines environmental law, trade law and Customs law in a legally binding international instrument with 183 parties. This is why CITES is at the intersection of trade, and environment and development.

This year the theme is 'big cats under threat'. A journalist asked me the other day, how to handle the serious decline of big cat populations and how to stop poaching. I could only respond in very general terms that first we need to understand why they are declining, why they are poached and depending on the

driver there may be different solutions like compensation schemes, ecotourism initiatives, etc. This conversation about big cats is starting today here in Bern thanks to the initiative of the IUCN SSC Cat Specialist Group.

In the 1970's and 1980's, CITES' first challenge was the use of big cat fur in the fashion industry and CITES successfully help to stop this trend. Now the focus is on other threats to big cats such as loss of habitat and fragmentation, conflict with humans, depletion of the prey base (including insects), unsustainable or illegal trade in parts of the big cats like the bones, meat, teeth, etc. Other issues that require immediate attention include felids held captive in farms in South East Asia, cheetahs being kept as pets in the Middle East, human-jaguar conflicts in South America, etc.

How can normal people help? Talk to your politicians to support nature, support wildlife authorities and local communities, attend CITES and CMS meetings, follow us on social media platforms, participate in our targeted initiatives, help protect the lives of those who protect the big cats in the field-scientists, rangers. Children can create wildlife clubs in their schools.

WWD is also an opportunity to express gratitude to Switzerland for its role in CITES as a supportive government, host of the Secretariat and a prominent party. Switzerland hosts the majority of the Standing Committee, Animals Committee and Plants Committee meetings in Geneva and now has become a major investor in CITES and wildlife. CITES benefits greatly from its high-quality services, neutrality, generosity, modesty. Last but not least, WWD is the ideal location to pay tribute to all those who work on wildlife conservation.





MATTHIAS LÖRTSCHER

Trade and Big Cat Conservation: the Convention on International Trade in Endangered Species of Wild Fauna and Flora



Matthias Lörtcher has a PhD from the University of Bern and did his post-doc at the Université de Provence in Marseille, France. In 2005, he became the head of the CITES Management Authority of Switzerland at the BLV. Since 2016, he has been the Chair of the CITES Animal Committee.

The Convention on International Trade in Endangered Species of Wild Fauna and Flora CITES is an agreement between governments around the world to ensure that international trade does not threaten the survival of wild plants and animals. It is one of the environmental legal instruments that works on the ground and in the field to conserve species. A total of 183 parties have adopted the Convention and work together to achieve its goals.

How does CITES ensure that no species of plant and animal goes extinct because of unsustainable trade? It has developed an elaborate system of permits that are issued by management authorities in every country. Scientific authorities in every country. In parallel, scientific authorities in each of those countries carry out surveys and must ensure that the trade is sustainable based on scientific data.

In addition every party has to submit annual reports of all their exports and imports. These data are then analysed within the scientific bodies of CITES. If based on these data, the trade is deemed to be unsustainable, then there are measures that can be put in place. These measures are first supportive in nature and if no improvement is documented may end up in trade suspensions. Parties having such restrictions on trade are notified and are listed on the CITES website (see www.cites.org).

Structure of CITES (Fig. 1)

1) The Conference of Parties CoP is the supreme body of the CITES Convention. It takes the key decisions and delegates work to other bodies.

- 2) The Standing Committee acts as an executive body taking decisions in the period between Conference of Parties.
- 3) The Animals and Plants Committee are the scientific bodies advising the CoP on these matters.
- 4) The CITES Secretariat administers the entire Convention.
- 5) The IUCN, TRAFFIC, WCMC are all organisations which provide the knowledge and scientific basis for the decisions taken by the Standing Committee and the Conference of Parties.

CITES – the species

Over 35,000 species are listed in CITES with 29,000 plants and over 6,000 animals species. These are arranged into three appendices. Appendix I lists species which are threatened with extinction and for which

no commercial trade is permitted (approx. 1,000). For instance several species of big cats, rhinoceros and elephants are listed on Appendix I. Appendix II hosts the majority of the remaining species; trade is allowed but it has to be carried out in a sustainable way and requires monitoring to ensure this.

What the convention can and cannot do

The aim of the Convention is to list the species according to their conservation status and levels of international trade. It ensures that the trade is sustainable, legal and traceable. However, CITES is not an international police organisation. It therefore can only support all efforts by parties in fighting against illegal trade. Furthermore, if a species is not traded internationally and depends on local conservation measures, CITES cannot intervene.

CITES and Big Cats

The leopard is listed in Appendix I where no commercial trade is allowed. However, under Resolution Conf. 10.14, there is the possibility for several parties to have quotas for hunting leopard as trophies. These quotas have been approved by the Conference of the Parties. However, the quotas have not been reviewed for a long time and the situation of the leopard has deteriorated over its whole range. Therefore the Animals Committee will review the quotas with the current scientific information submitted by these parties.

A long-standing issue are the Asian big cats; they are listed in Appendix I with no com-

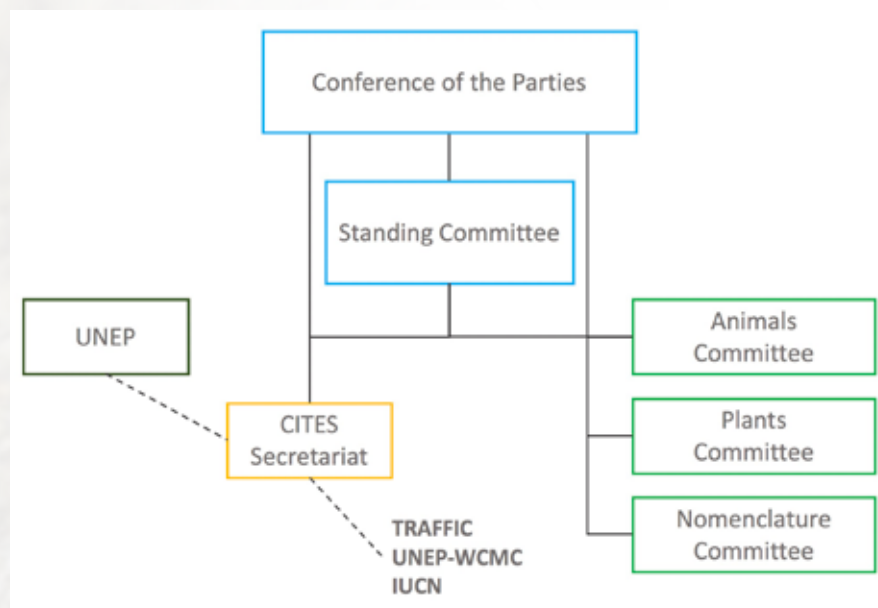


Fig. 1. Organisational structure of CITES.

mercial trade allowed. However, today there are farms raising large Asian felids such as tigers in large numbers for international trade. CITES has been trying to find a solution with range and consumer states, asking them to have legislative and regulatory measures to fight against illegal trade of wild tigers. The Convention also requests countries to have robust national law enforcement, develop demand reduction strategies, carry out education and awareness raising within their countries. Even though some of these activities go somewhat beyond the CITES mandate, all parties have agreed to them.

Cheetahs are another example of an illegally traded large felid. Cheetahs are popular as pets in some regions of this world. Therefore the Convention asks Parties to launch awareness campaigns to curb the demand as well as strengthen national and regional

enforcement actions to fight against this illegal trade.

At the last CoP in 2016, a proposal to list the African lion on Appendix I was put forward, which after long discussions was rejected. However, several additional measures were put in place, for instance a zero-export quota of lion parts and derivatives taken from wild specimens.

In addition the African Carnivore Initiative has been launched. This is a joint CMS-CITES programme with strong support from IUCN, which looks at four top predators in the African landscape which are threatened by the same causes. The predators targeted are lions, leopards, cheetahs which are all CITES listed species but also the African wild dog which is not listed under CITES. Among the threats that these four predators face

are habitat loss and fragmentation, conflict with humans, depletion of prey base and the illegal wildlife trade. The joint programme pools resources and complements expertise of the CMS and CITES to more efficiently coordinate and implement conservation programmes across the African range.

Conclusions

In summary, the CITES Convention as a trade Convention in the interest of conservation has listed all wild cat species in its Appendices. For some, no trade is allowed and in others the level of trade is kept at a sustainable level. Specific actions are undertaken in order to improve the situation for a range of species. However, many of those species have been declining in the last decades due to factors outside of the scope of CITES, such as habitat loss, depredation and prey base, human/cat conflicts and illegal trade.

CITES Appendix I

Species threatened with extinction which are or may be affected by trade. Trade with these species is, with a few well defined exceptions, prohibited.

CITES Appendix II

Species which may become threatened with extinction, unless trade in these species is not controlled. In addition, includes species which may be confused with the previous group.

CITES Appendix III

Appendix III is a list of wildlife and plant species identified by particular CITES member countries as being in need of international trade controls.



M. Pittet



DALE MIQUELLE

Tigers in India versus Russia: conservation at the extremes



Dale Miquelle, is the WCS Tiger Program Coordinator, and coordinates research and conservation actions to protect large carnivores and the ecosystems upon which they depend. He has spent the last 25 years in the Russian Far East focusing on tiger conservation. He obtained a PhD from the University of Idaho. Dale Miquelle worked on the Tiger Ecology Project in Chitwan National Park, Nepal as well as with wildlife in Alaska.

Tigers are the most endangered large felid despite their popularity with the general public. While general trends put the global population of leopards at perhaps 200,000, lions at 30,000, jaguars at 15,000, and snow leopards at 7,000, the global wild tiger population is estimated to be less than 4,000 individuals. Moreover, they currently occupy only about 7% of their original range.

Although tigers presently occur in at least 10 countries, this presentation focuses on the conservation and ecology of tigers in only two: India and Russia. If you look at the popular literature about tigers in India and Russia, there is almost a type of competi-

tion about whose tiger is the biggest, whose tiger the toughest, and whose tiger is most likely to survive the current environmental crises in Asia. I derived a series of fairly simple questions that play on this competition to compare the ecological constraints and conservation imperatives for Bengal and Siberian (or Amur) tigers in these vastly different settings.

By understanding the similarities and differences between these two sub-species, we can better understand the similarities and differences in actions needed to ensure survival of tigers in these very different landscapes.

Who is “king of the jungle?”

There is evidence in the popular literature to support claims that either the Bengal or the Siberian tiger could be the largest tiger in the world. Actual ecological theory would predict that Siberian tigers, being the northernmost, should be the largest (to help protect them from the cold). Data on weights of tigers in the wild are in actuality quite rare – especially for Bengal tigers. Nonetheless, gathering all the reliable evidence on wild tiger weights we found strong evidence that Bengal tigers – both males and females – are consistently larger than their northern cousins (Table 1).

Who’s the “ultimate” hunter?

Solitary hunters, tigers are known to kill a wide variety of species to fill their daily energetic requirements. Prey options in India are more varied with small antelopes such as muntjac *Muntiacus muntjak* and spotted deer *Axis axis*, medium-sized prey like sambar deer *Rusa unicolor* and large species like gaur *Bos gaurus*, rhinoceros *Rhinoceros unicornis*, and even elephants *Elephas maximus* as potential prey.

In Russia, moose *Alces alces* are among the largest potential prey while red deer *Cervus elaphus*, sika deer *Cervus nippon* and wild boar *Sus scrofa* fall in the medium sized species.



Fig. 1. Bengal tiger in Ranthambore, India (Photo J. Harsha).

Of the two subspecies, who takes the biggest prey? It turns out that research on prey selection by tigers demonstrates that tigers generally all prefer to take species that are about their own size, with the small difference in size between Bengal and Siberian tigers not being a significant factor here (Table 1). Tigers in Russia generally prefer red deer and wild boar as their primary prey, while in India sambar deer (very similar to red deer) and wild boar are the favourites. Tigers in Russia and India appear to focus on similar sized prey for a number of reasons. First, as a solitary predator, tigers cannot afford to become injured. Taking on a larger adversary, like a rhino, elephant, or even adult gaur, is serious business, where an injury in such an encounter could be fatal for a tiger.

But if safety is the issue, why do tigers not just focus on small and easy prey? To answer this question, we need to look at the energetics of tigers, with special attention to females with cubs (Table 2). If you look strictly at energetic needs, a male tiger relying solely on medium-sized prey (their own size) needs to make about 17 kills a year. A solitary female (being slightly smaller) needs about 13 kills a year, but a mother with two cubs needs far more, about 25 kills a year.

If we compare those kill rates to requirements when relying exclusively on small

sized species like muntjac or musk deer, the number of kills needed per year increases dramatically. In such a case, males would need to make about 200 kills a year to survive, solitary females would need to make about 147 kills a year, but a female with two cubs would need at least 290 kills a year. This means she needs to make nearly one kill a day which is probably physically impossible in any landscape, no matter the density of prey. These simple estimates of energetic needs demonstrate that it would be extremely difficult for solitary tigers to survive solely on small prey (which would require them to make kills about every 1.5–2 days) and that successful reproduction would be pretty much impossible. Focus on very large prey would be too risky. Therefore, tigers settle on the “golden middle ground” – moderately large ungulates that are close to their own size.

Absence of such prey would likely make it impossible for successful reproduction to occur at such sites.

Who has the most prey?

This is an easy question to answer. Anyone who has travelled to national parks in the Indian Sub-continent has seen the masses of ungulates that occur in these undisturbed areas. The mild climate and the highly productive ecosystems can sustain high numbers of herbivores. In contrast, the harsh winters of the Russian Far-East and the associated low productivity in these ecosystems result in low ungulate densities. Where Bengal tigers still occur, life is much easier for them than Siberian tigers, who must look far and wide to secure prey. Consequently, tigers in India can reach much higher densities than tigers in Russia: where densities of 20 tigers/100 km² have been reported in the Indian subcontinent, densities over 1 individual/100 km² are seldom observed in Russia.

Who is the most productive?

It has often been stated in the popular literature that Bengal tigers “breed like rabbits” and if they are well protected with sufficient prey, tiger numbers will increase quickly. Intuitively, one might expect Bengal tigers to reproduce more quickly than Siberian tigers, given the abundance of prey. A closer look at the reproductive parameters suggests differently on both counts (Table 1). Data from both regions have shown that both Bengal and Siberian tigers have similar reproductive rates: age at first reproduction, cubs/litter, and inter-birth intervals are all surprisingly similar, suggesting two things: 1) there does not appear to be any major differences in reproductive rates of the two subspecies; and 2) neither sub-species “breeds like rabbits.” As large-bodied mammals with relatively low birth rates, long inter-birth inter-

Table 1. Comparing the ecology of tiger in India versus Russia.

Parameter	Russia	India
Body size	+	-
Prey preference	=	=
Prey density	+	-
Tiger density	+	-
Reproductive rates	=	=
Home range size	-	+

vals, and great variability in survival of cubs, there is no guarantee that tiger populations will recover quickly, and more often than not, we can expect only gradual, relatively slow recovery periods.

Who has the largest home range?

The result of 15 years of fieldwork in Sikhote-Alin has revealed Siberian tigresses' home ranges tend to be about 400 km². Compared to them, Bengal tigresses have tiny home ranges, often not exceeding 20 km². The dramatic differences are due to the dramatic differences in prey abundance: in India, tigers simply do not need to travel far to secure sufficient prey.

What do these ecological differences and similarities mean for tiger conservation?

In contrast to the popular literature, we found many similarities between Bengal and Siberian tigers, but some important differences. Food requirements and prey size requirements are quite similar. Reproductive rates, and therefore population growth rates and recovery from poaching, can be expected to be similar in both countries. But there is one huge difference between the subspecies: because prey densities are so high in India, tigers can survive in very small areas. To protect a population of 25 adult reproducing tigresses in India requires only 500 km², while it would require 10,000 km² of space in Russia. Hence, the space needed to protect tigers in Russia is vastly greater than in India. While protected areas in Russia tend to be bigger than in India, they are still not large enough to protect such large numbers of tigers. Therefore, one of the most dramatic differences in conservation strategies between the two regions is that while well-protected national parks in India can retain large numbers of tigers, management of tigers in Russia must extend beyond the boundaries of protected areas, which are never sufficient to retain viable populations of tigers.

Fortunately, the human conditions in each country are such as to allow – at least for now – the survival of tigers. In India, tigers live on isolated islands (in protected areas) within a sea of humanity. People are nearly everywhere outside protected areas, but because protected areas are so productive, tigers can persist. Just as importantly, the surrounding public is incredibly tolerant of

Table 2. An estimate of minimum number of kills (assuming only one species is taken) needed to meet energetic requirements explains why medium-sized prey are so important. Projects suggesting reintroduction of tigers often assume that an abundance of muntjac qualifies a site as suitable for tigers, failing to recognize the ecological importance of medium-sized prey. Absence of such prey would likely make it impossible for successful reproduction to occur at such sites. It is worth noting that tigers actually kill more often than estimates of energetic requirements suggest – about two times as much. Loss of meat to scavengers, rottage, and incomplete use of kills explains the difference (adapted from Miller et al 2014).

	Red deer / Sambar		Musk deer / Muntjac	
	# Kills/year	Days/kill	# Kills/year	Days/kill
Male	17	21	200	1.8
Female	23	28	147	2.5
Female with 2 cubs	25	15	290	1.2

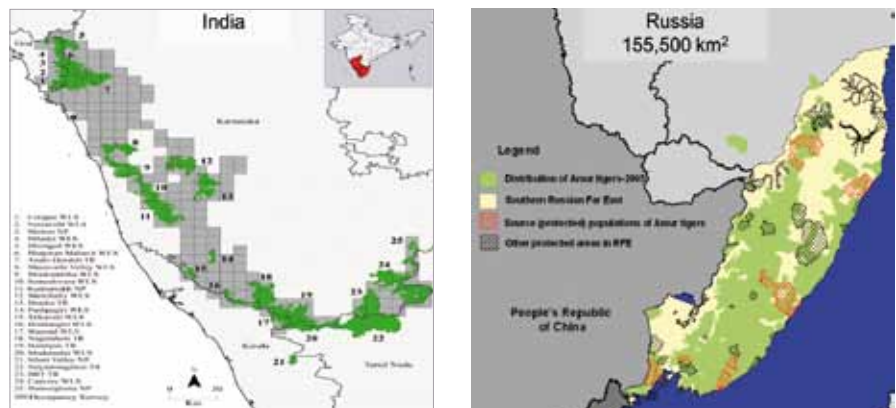


Fig. 2. Protected areas in both countries are the key to the survival of the two tiger subspecies.

the presence of tigers and other wildlife species as neighbours. Consequently, all can co-exist.

In Russia, people are nowhere near as tolerant of species like tigers, but it is the humans who live in small islands (villages) surrounded by vast tracts of forests, which are the domain of tigers. Even though humans are not as tolerant, human densities are low, and consequently interactions and conflicts between humans and tigers are relatively rare. There are still vast tracts of forest both inside and outside protected areas where tigers still roam. Because human densities are so low, tigers can persist, but survival will depend on suitable habitat both within and outside protected areas.

In both countries, ensuring there exist source sites (which are usually protected areas) where tigers can live, and reproduce in security, is key to long-term survival. These source sites must act as “reproductive centers” where birth rates are high and mor-

tality rates are low, so that young animals will disperse out of these sources sites into the larger landscapes. Just as importantly, there must be connectivity between these sources sites so that there is exchange of genetic material, thereby avoiding the deleterious effects of inbreeding depression. Hence, the overall conservation strategy – safe havens (protected areas) connected by sufficiently porous ecological corridors – are similar in both countries. However, because of the scale at which tigers live in Russia, the total area requirements will be some 20 times greater than in India. Fortunately, such space still exists in Russia.

The plight of the tiger is real; extinction is looming on the horizon if we do not make the right choices. However, if we understand tiger ecology sufficiently and understand the differences and similarities across their range, we can make the right conservation decisions to assure a much brighter future for the tigers.

SUGOTO ROY

Money makes the tiger roar: IUCN's integrated tiger habitat conservation programme



Sugoto Roy has worked in NGOs, government departments and universities specialising in a variety of conservation issues including wildlife management, invasive species and human wildlife conflicts around the world. He is currently the coordinator of the integrated Tiger Habitat Conservation Programme at the IUCN.

Tigers are the largest wild felids in the world with the biggest individuals reaching up to 300 kg in weight and three metres in length. Their home range is dictated by the availability of prey and mates. The taxonomy of tigers is a raging contentious issue at the moment in the tiger world. Based on the revised taxonomy of the Felidae produced by the Cat Classification Task Force of the IUCN SSC Cat Specialist Group, tigers have been reclassified as two sub-species.

The tiger range has greatly reduced and three out of the thirteen tiger range countries no longer have evidence of tigers anymore. Efforts, funding and investments need to be focused on the "tiger conservation landscapes" where tigers still occur, to have a long-term effect on tiger conservation (Fig. 1).

Main threats: Habitat loss: across Asia, vast tracts of land are being converted into sugarcane or palm oil cultivations and being industrially logged. On a smaller scale, local people living alongside protected areas collect firewood inside tiger habitats. Fragmentation is an important threat to tiger habitats; Asian countries are developing rapidly with road and railway infrastructures cutting across these habitats and there is little landscape planning. The Indian government is currently planning a scheme to link several rivers across the country, for example between the Ken and Betwa rivers in Madhya Pradesh. Palm oil plantations are widespread across Indonesia, one of the primary causes for the deforestation of rainforests in this area.

Tiger poaching: Tiger parts are used in traditional medicine in South East Asia and China even today and tigers are poached across

their range to feed this industry (Fig. 2). The illegal wildlife trade is a serious threat to the persistence of tigers across their range. In some countries, there are tribes that are traditional poachers, hunting bushmeat as well as carnivores. They are often nomadic and therefore difficult to track.

Human-wildlife conflict: retaliatory killing of tigers to avenge the loss of livestock is especially common in areas where the human density is high around protected areas. People who do not have sufficient income to feed their livestock often let their cattle graze inside protected areas, increasing the chance of predation by tigers and leopards. Livestock grazing in forests also increases the chance of transmitting viruses like foot and mouth disease. Studies have shown that tigers kill

more cattle than wild prey when wild prey population densities are low. People retaliate by poisoning carcasses or using snares. Poisoned carcasses not only cause the death of tigers but other species like vultures which are in already serious decline. Snares maim and injure tigers and other species, causing predators to target easy, slow-moving prey like domestic animals. In areas where protection measures are more successful, tiger and leopard populations are increasing. Leopards, the less dominant species, are often pushed into human-dominated landscapes, making human-wildlife conflicts more common.

Conflicts not only arise from predators; herbivores often crop raid leading to significant financial losses to local farmers. Often the context is broader; there are several issues such as tigers preying on livestock, elephants raiding crops compounded by underlying urgent concerns such as poverty, alternatives to sustainable fuel, access to water, etc. There is a need for long-term viability of tiger populations but this goes hand in hand with the sustainable development of local communities.

The German Ministry BMZ, through the German Development Bank, KfW (Kreditanstalt für Wiederaufbau) has provided significant funds for sustainable development throughout Asia and has managed to secure some of that money for sustainable development in tandem with tiger conservation. So, it is using tiger conservation as a focus, as an excuse to carry out good conservation



Fig. 1. Map of projects funded by the programme (Photo ITHCP).

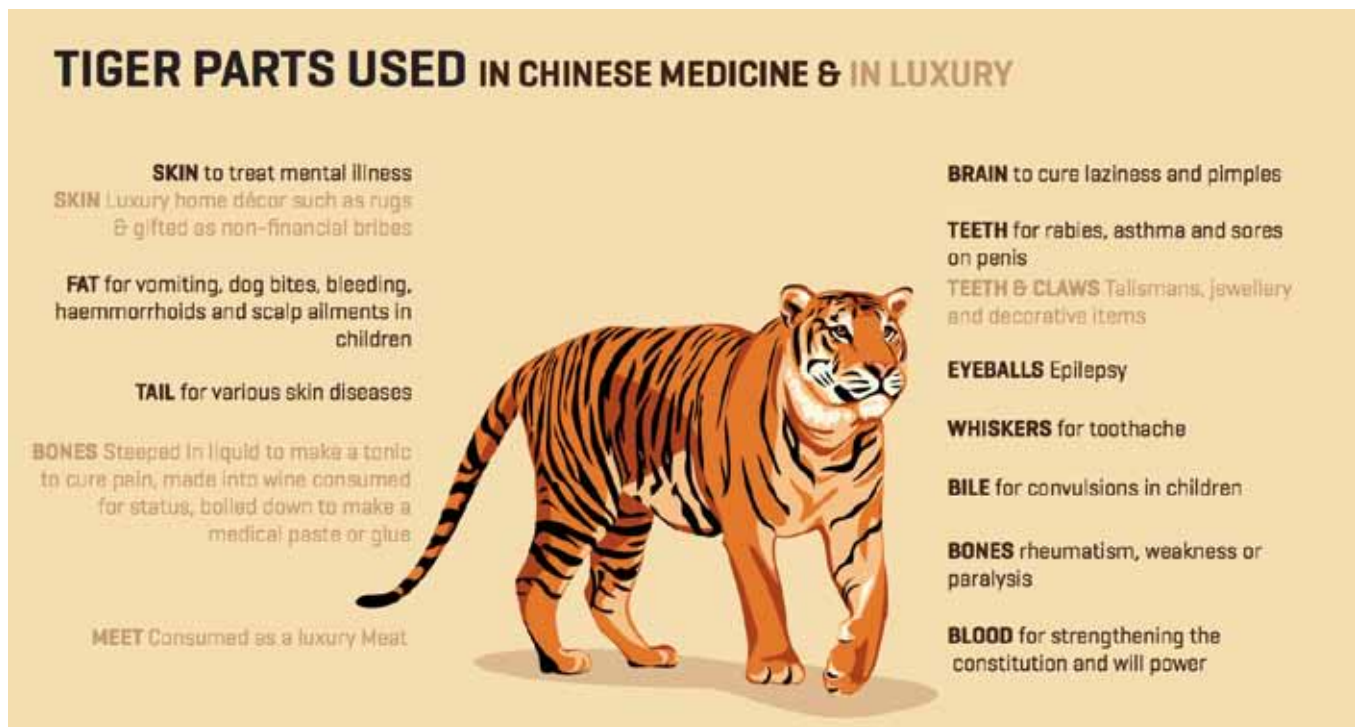


Fig. 2. How tiger body parts are used for in traditional Chinese medicine (Figure K. Guntersweiler).

friendly-sustainable development through the IUCN-led programme, the Integrated Tiger habitat Conservation Programme ITCHP. The main requisites and requirements of projects within this programme are to align with government policy and put safeguards into place so that the projects do not cause any harm to local communities. The NGOs running the projects do not tell people what they can or cannot do, but instead, they work alongside with them. There are nine countries eligible to receive KfW development aid. Some tiger range countries like Thailand or China cannot receive aid through this particular agreement.

Projects receiving money from the programme are entitled to a project preparation grant to help design the larger project. One main objective of the project preparation grant is to set up the environmental and Social Management System ESMS to make sure the NGO is not creating a negative impact on local communities. ESMS, is an assessment which makes sure that the projects are truly working with local communities. For example, people cannot be evicted from parks as this is not a viable solution and this is something that is increasingly required by a lot of donor agencies. All of the ITCHP projects have three elements: species, habitat or ecosystem and people. Projects have to ensure that activities relating to these three aspects are intergrated into their project design.

The ITCHP provides grants of up to two million Euros and the selection process is robust. The programme advisory committee is made up of experts in development, protected area management and wildlife conservation and include researchers working with Panthera, WWF, WCS and the RSPB. All projects are also peer-reviewed, and the review process goes through the IUCN Specialist Groups.

The projects have a number of activities ranging from providing alternative fuels like liquid-petroleum based stoves, to avoid firewood collection in protected areas. They also train and equip primary response teams if tigers go into villages as well as train local communities in veterinary and husbandry techniques for more efficient livestock rearing. There are also projects that equip and train rangers and teach them about camera-trapping. Some projects are helping local communities to develop ecotourism in Indonesia. Another is introducing solar lighting in tea estates in Assam, mainly to protect villages against elephants but also increasingly against tigers.

Once projects are launched, regular reports are sent in and the activities are monitored from within and validated by IUCN. Experience has shown that while smaller projects tend to be better focussed than larger projects, larger projects run by larger NGOs

have a longer term field presence, thus providing more inherent sustainability of activities. All projects have a range of activities which are monitored and validated through a combination of self-monitoring, together with validation from monitoring by IUCN staff. All projects are visited regularly to ensure the funds are properly used. A programme wide workshop held recently provided a good opportunity for people to get together and look at what is working and what is not and provided opportunities for people to learn from other projects.

The Programme is currently at its half way point and a review has recently been undertaken to see what is and is not working, and how things can be improved.

The next phase of the programme is currently under development and this mid-term learning will help us to refine the programme and see if some themes such as tackling nomadic poaching tribes, or determine if some geographical areas, organisations or universities are being missed. One recurrent message from our projects is that training workshops held by the different projects within the programme portfolio are effective, especially where the participants lead on specific themes or field based activities in project sites and can share their first hand experiences.

World Wildlife Day 2018 in pictures





M. Pittet



M. Pittet



M. Pittet



M. Pittet



M. Pittet



M. Pittet



M. Pittet



M. Pittet

HADI AL HIKMANI

Leopards, camels and frankincense: the Arabian leopard of Dhofar, Oman



Hadi al Hikmani started out as a wildlife ranger for the Arabian Leopard Survey team in 2002. Since then, he has completed a BSc in Wildlife Conservation at the Durrell Institute for Conservation and Ecology, University of Kent in the UK. Today he is a wildlife specialist at the Office of Conservation of the Environment, Diwan of Royal Court in Oman. He is also pursuing a PhD in evolutionary history and population genetics at the University of Kent.

Arabian leopards *Panthera pardus nimr* are intricately linked with two other elements in their landscape, making it impossible to talk about the leopards without mentioning camels *Camelus dromedarius* and frankincense *Boswellia sp.*

The Arabian leopard is one of the eight recognised leopard sub-species. It is endemic to the Arabian Peninsula and is listed as Critically Endangered on the IUCN Red List of Threatened Species because of a combination of threats. It is also listed in CITES Appendix I. Historically, the Arabian leopard occurred throughout the mountains of Arabia (Fig. 1). Today, its distribution is limited to the Dhofar Mountains of southern Oman and the western part of Yemen (Fig. 2). Although there is little current information from the Yemeni part of its range, data has been collected over several years from the Dhofari leopard population.

The Arabian landscape is often associated with great sand dunes and endless gravel plains but the Dhofar mountains are characterised by lush green forests and verdant grasslands resulting from the south-west monsoon that each year blankets the mountains in thick cloud. Leopards are found in both the lush tropical forests and the hyper-arid true desert. Some parts of the Dhofar mountains are remote and can only be accessed with the help of camels. Camels have been an essential part of life and culture of the pastoral people of Dhofar for millennia. Today the people are no longer dependant on this 'ship of the desert' but they continue to keep large herds in numbers that exceed the carrying capacity of the rangelands. Ca-

mel numbers have increased dramatically, leading to overgrazing and environmental degradation. This has increasingly brought leopards into contact with camels and their owners. Leopards will occasionally kill camels and when this happens, livestock owners respond by killing the leopards.

Like camels, frankincense trees are an important part of the leopard landscape and are found in the drier habitats. Frankincense resin is a highly sought-after substance used in perfumes and incense and has been harvested and traded for over 5,000 years; from the courts of Roman nobles to the great rulers of India (Fig. 3). Frankincense is still harvested today, in some cases, illegally. The activity of harvesters within protected areas has contributed to leopards

being disturbed and pushed into marginal and less suitable habitats.

Threats to Arabian leopard

Human-wildlife conflict: Just like other big cats, the main threats to the Arabian leopard population are from persecution due to livestock predation and the illegal trade in wildlife. The last leopard confirmed in Saudi Arabia was killed in 2014, while another leopard was killed in February 2018 in Yemen. Leopards are being persecuted in the wild at every opportunity.

Loss of prey base: Another important threat to the persistence of leopards in the Arabian landscape is the loss of their prey base. The Nubian ibex *Capra nubiana* and Arabian gazelle *Gazella arabica* are two of the most important prey species but are also targeted by local people for their meat.

Habitat loss and fragmentation: The growing human population and the consequent pressure on the land to meet its needs, is negatively impacting leopards and their associated biodiversity. Furthermore, the growing livestock population has increased competition with wild herbivores for limited grazing resources. The presence of livestock in protected areas also increases the risk of the spread of diseases and infections. The leopard in Dhofar has lost almost 80% of its historical range (Fig. 1).

Loss of genetic diversity: The Arabian leopard is listed as Critically Endangered be-



Fig. 1. Historical (orange) and current (light green in red squares) distribution of Arabian leopard in the Arabian peninsula.



Fig. 2. Camera trap photograph of an Arabian leopard in the Dhofar mountains (Photo H. al Hikmani).

cause there are fewer than 200 individuals in isolated populations. The risk of genetic loss increases when the population is small and isolated and this loss can result in individuals being less able to cope with changes in their environment and adapt to new conditions, such as those that will result from climate change. In order for a species to evolve successfully there must be sufficient genetic diversity in the population.

Illegal trade: the trade in wildlife and animal parts is difficult to estimate but, outside Oman, poaching is an important cause of the decline of the Arabian leopard. Although it was not considered to be significant in the past, it seems to be a key threat today. Several leopards have been smuggled from Yemen for trade into the neighbouring countries since late 1990s.

Conservation Measures

Oman has taken some very important measures to conserve its leopards. Although

some essential steps have been taken, a lot of work remains to be done. The first step was taken in 1976 to ban the killing of leopards and their prey species. In 1985, Oman established the world's first captive breeding programme for the sub-species with four leopards captured from the Jabal Samhan Nature Reserve. By 2014, there were over 70 leopards in nine captive breeding programmes across the Arabian Peninsula. Suitable habitats and protected areas are very important for big cats and in 1997, Oman declared Jabal Samhan an important area for the leopard and established it as a nature reserve. It covers 4,500 km² and is a core habitat for leopards and their prey including Arabian gazelle and Nubian ibex. In the same year the Arabian leopard Survey was launched; a long-term programme for research and conservation of the Arabian leopard.

Today, monitoring projects study the ecology of Arabian leopards in the mountains of Dhofar. As they live in remote areas which tend to

be characterised by harsh terrain difficult to access, most of the monitoring is with camera traps (Fig. 2). This technology has contributed to increasing our understanding about the habitat and ecology of the leopards. The camera traps have revealed a population of 30 to 35 individuals in the study areas and the population seems to have remained stable over the years.

Another important initiative started by the Office for Conservation of the Environment in 2014 was to compensate livestock herders for their livestock loss. This has been a good solution not only for the local people concerned but also for the leopard. Several cases have been compensated so far and it is possible that without this compensation, many leopards would have been killed in retaliation, drastically impacting the population.

Genetic studies have been initiated recently to classify the taxonomy of the sub-species



Fig. 3. Typical leopard habitat; Frankincense tree in the Dhofar mountains (Photos H. al Hikmani).

and its genetic diversity using both the captive and wild population. Such study will help in understanding the evolutionary history, historical and contemporary genetic diversity, gene flow and effective population size of this subspecies in the region.

is key to the success of conservation measures. Therefore, efforts have been taken to raise public awareness about the leopard and its importance as well as consulting local people regarding leopard conservation matters. The Dhofari people have today a better understanding of the leopard and are willing to contribute to its conservation (Fig. 4).

Conclusion

The Arabian leopard is a flagship species for Arabia. Based on current conservation measures, information from genetic studies and the presence of reliable government support there is some reason for optimism. However, the leopard population remains small and fragmented and as such the risk of extinction remains high.

Local people are an important aspect in conservation work and involving them



Fig. 4. Typical Dhofari family grazing camels in the Dhofar mountains (Photo H. al Hikmani).

TABELA LANZ

Scale of threat: The IUCN Red List Assessment



Tabea Lanz studied general biology at the University of Fribourg and did her Master in Wildlife Biology and Conservation at Edinburgh Napier University. Her research was on the Eurasian otter on the island of Raasay focused on population size and diet. Since 2012, she has been working as an assistant to the co-chairs of the IUCN SSC Cat Specialist Group. In 2017, she became the Red List Authority Coordinator of the IUCN SSC Cat SG.

The IUCN Red List Assessment

The IUCN Red List of Threatened Species is administrated and coordinated by the International Union for Conservation of Nature IUCN. The IUCN Red List of Threatened Species contains all IUCN Red List Assessments and is the most comprehensive source of information on the global conservation status of species of animal, plant and fungi. It is a checklist of all the species which have undergone an extinction risk assessment based on the IUCN Red List Categories and Criteria. The goal of this assessment and this list is to provide information about the status, trends and threats to species in order to inform action for biodiversity conservation.

The basic question the assessment seeks to answer is: what is the likelihood of a species becoming extinct in the near future, given the

current knowledge about population trends, range and recent, current or projected threats?

The assessment process

The IUCN has six commissions, one of which is the Species Survival Commission responsible for all the assessments. This commission has over 140 specialist groups each with different focus. For example, the IUCN SSC Cat SG is responsible for the assessments of all cat species. The Red List assessment is a comprehensive process done in the most objective way, based on scientifically rigorous data in order to determine the extinction risk of a species.

To start with, experts researching a particular species are chosen to assess the likelihood of the species going extinct. The first step is to collect all the information available about the species relating to its distribu-

tion, occurrence, population size and trends, habitats, ecological needs, conservation measures, threats, as well as its trade and use if applicable. An important aspect of this step is also the creation of a distribution map detailing historical and current distributions of the species concerned. Based on the compiled information and at fulfilment of at least one Red List Criterion, the assessors allocate an IUCN Red List Category to the species.

This is followed by a second step which consists of a peer review process; the assessment is scrutinised and the assessors can be approached in case of doubts. The final step is a "consistency and completeness" check which is done by both the specialist group responsible and the IUCN Red List Unit. Once the assessment is approved, it is then published on the IUCN Red List website alongside assessments of other species. The IUCN Red List assessments are done periodically which also contributes to monitoring the status of species across time.

Categories and Criteria

There are nine IUCN Red List Categories a species can be assigned to. The categories Critically Endangered, Endangered and Vulnerable form the "threatened categories" (Table 1).

There are five criteria that are used to evaluate which IUCN Red List category a taxon falls into:

- A. Population size reduction
- B. Geographic range (extant of occurrence or area of occupancy)

Table 1. Overview of the nine IUCN Red List Categories.

Category	Definition
Extinct	A taxon is declared Extinct when there is no reasonable doubt that the last individual has died. E.g. Smilodon
Extinct in the Wild	A taxon is described as Extinct in the Wild when the last known individuals only exist in captivity. E.g. Scimitar oryx
Critically Endangered	A taxon facing an extremely high risk of extinction is categorised as critically Endangered. E.g. Arabian leopard
Endangered	A taxon that is considered Endangered when evidence shows that it faces a very high risk of extinction. E.g. Tiger
Vulnerable	A taxon that is threatened by a high risk of extinction is listed as Vulnerable. E.g. African golden cat
Near Threatened	A taxon that is likely to qualify for a threatened category in the future is considered to be Near Threatened. E.g. Jaguar
Least Concern	A taxon which is widespread and abundant with a low extinction risk but still facing a risk in the future is listed as Least Concern. E.g. Caracal.
Data Deficient	A taxon listed as Data Deficient when there is insufficient information to make an extinction risk assessment.
Not Evaluated	A taxon for which no extinction risk assessment has been conducted is listed as Not Evaluated.

- C. Small population size and decline
- D. Very small or restricted populations
- E. Quantitative analysis

A closer examination of criterion A “population size reduction” will shed further light on the assessment process. This criterion applies only to taxa that have undergone a population size reduction in the near past, or are projected to significantly being reduced in the near future or for taxa for which the population reduction includes the past and the future. Thus, the general population size trend is examined (Fig. 1).

The decrease refers to the number of mature individuals (i.e. the individuals capable of reproduction) in the population and is measured over a duration of ten years or three generations (whichever is longer). Depending on whether the species population size reduction occurred in the past or is suspected to occur in the future, different sub-criteria apply:

- A1. The population reduction occurred in the past; the causes of the reduction are clearly reversible and understood and have stopped.
- A2. The decline in population occurred in the past but the causes of the reduction may not be understood or may not be ceased or may not be reversible.
- A3. The decrease in population is predicted for the future but the causes and effects remain unknown.
- A4. The population decline started in the past and will continue into the future. Again, in this case the causes may are not understood, have not been ceased or may are not reversible.

Table 2. Thresholds for the Criterion A population size reduction.

	Critically Endangered	Endangered	Vulnerable
A1	≥ 90 %	≥ 70 %	≥ 50 %
A2, A3 & A4	≥ 80 %	≥ 50 %	≥ 30 %

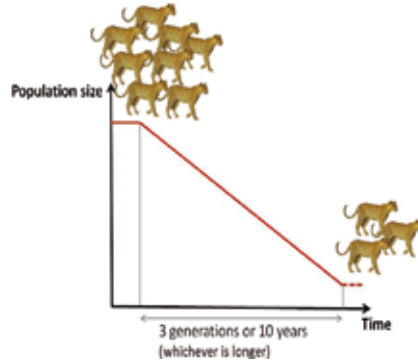


Fig. 1. Examining the general population size trend (Photo M. Pittet).

Pre-defined quantitative thresholds have been determined for each criterion which allow the assessor to determine which category the population will fall in. For example, for Criterion A, in the case of a species whose population was reduced or is suspected to be reduced by over 30% but less than 50% along the course of three generations, it will be placed in the Category Vulnerable. In the same case but with a decrease in population size equal or higher than 50% but less than 80%, the species will be classified as Endangered. For a species where the population size reduction in the past was or the expected reduction in the future is equal or higher than 80% it would be classified as Critically Endangered. In the case of A1, the thresholds are slightly lower because the causes for the decrease in population size are known, ceas-



sed and reversible. Therefore, it is assumed that the extinction risk of the species is reduced (Table 2).

The IUCN Red List Assessment of the leopard *Panthera pardus*

The leopard is decreasing across its range (Fig. 2). The estimated range loss in Africa is 48–67% while in Asia, it is 83–87%. The main causes threatening leopard populations are habitat fragmentation, conversion and loss, prey base reduction, poorly managed trophy hunting, illegal wildlife trade, accidental killing in snares and persecution due to conflict with livestock and game farming. Based on this, the leopard was up-listed to Vulnerable in 2016, facing a high risk of extinction in the near future. The Category VU was assigned based on the Criterion “A2cd”. This means that based on a decline in area of occupancy, extent of occurrence and/or habitat quality and based on the actual or potential level of exploitation of this species a population reduction of over 30% in the last three generations is suspected.

The IUCN Red List of Threatened Species is a very important conservation tool which informs international conventions such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora CITES and the Convention on the Conservation of Migratory Species of Wild Animals, facilitates national legislation and also helps define priorities in conservation planning and conservation measures.

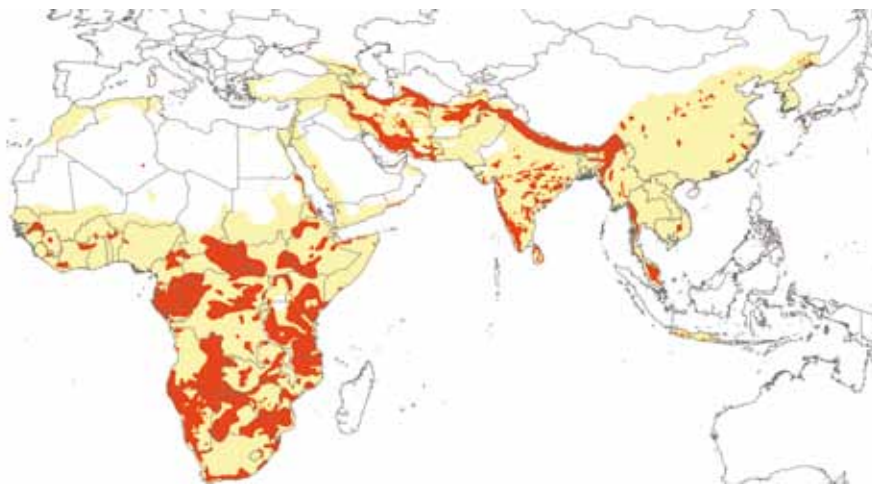


Fig. 2. Leopard distribution range. Current range: red, historic range: yellow (Map P. Gerngross).

LEILI KHALATBARI

Status of Asiatic cheetahs in their last refuge – Iran



Leili Khalatbari started working with wild cats in 2005, when she was doing her bachelor thesis on the status of sand cat in Kavir National Park in Iran and continued by collaborating as volunteer in different projects namely Conservation of Asiatic Cheetah Program CACP. Later she went to Uppsala University to study ecology and conservation biology. She is now doing a PhD in CIBIO/InBio, University

of Porto on “habitat connectivity of Asiatic cheetah in central deserts of Iran” to provide relevant information for better conservation of this critical endangered species. She is also collaborating with experts from CACP, DoE, WCS and the IUCN SSC Cat SG for developing a conservation action plan to rescue and recover the critically endangered cheetah population in Iran.

Cheetahs are incredible animals with a long history with human beings; they have been mentioned in literature and art. They were once distributed across Africa and South-west Asia but due to habitat transformation and fragmentation, they have lost a great portion of their historic range. Asiatic cheetahs *Acinonyx jubatus venaticus* are a distinct subspecies that diverged from the African ones about 40,000 years ago. In Asia, the range regression was more severe than in Africa to the point that they have been extirpated from almost all of their range. By the 1970's they were limited to Iran where they were protected by law. At that time their population was stable, estimated at about 400 individuals and was considered almost abundant in the arid parts of the country (Fig. 1a).

However, after the revolution, the Department of Environment DoE lost the control of many areas. This resulted in local people with weapons and four-wheel drive vehicles entering protected areas and slaughtering wildlife, this loss of prey led to a severe decline in the population of cheetahs. At this time conservationists became concerned about the status and future of cheetahs in Iran. They began increasing their conservation efforts to preserve the species. Today the Asiatic cheetah is only found in central parts of Iran and are considered to be Critically Endangered on the IUCN Red list of Threatened Species.

In 2001, the Conservation of Asiatic cheetahs, its Natural Habitats and Associated Biota

CACP received funds from the GEF Medium-Sized projects to coordinate all the cheetah related programmes in the country. At first there were only reports from these areas (Fig. 1b) but after some years, by gathering more evidences and camera trap photos from the other areas, the known range was expanded (Fig. 1c). However, it is important to note that this increase in records was not only due to conservation effort but rather because of an expansion of monitoring effort. Although our knowledge of the cheetahs is currently greater than before, there are still many things about the basic ecology of the species that we do not know.

Current status of the Asiatic cheetah

Last spring, as part of my PhD work and in collaboration with CACP, WCS and Cat SG, we decided to assess the current status of Asiatic cheetah. This was done through fieldwork in protected areas, interviewing game guards, directors of protected areas, relevant experts and NGO members and compiling all the published and unpublished records.

The areas marked in red (Fig. 1d) are places where in the last three years there have been no cheetah observations; there have been observations only from the areas marked in green. The dark green indicates stable populations and the other areas marked in lighter green need more surveys to assess the population status. There has been evidence of reproduction from only two areas (Touran Biosphere Reserve and Miandasht Wildlife Refuge No. 1 & 2 in Fig. 1d).

This range decline is alarming, but what is more alarming is that in all of these areas, over the last three years, only 26 individuals have been identified. While, this is not the ultimate number of cheetahs in Iran, it has increased the concern that there are not more than 50 individuals left in all the country.

Threats to cheetahs

1) *Livestock*: in Touran Biosphere Reserve alone (14,415 km²), 76,000 sheep and goats are permitted to enter and graze annually. They are not only competing with herbivores for limited water and food resources, but the guarding dogs which accompany the herds are threatening wildlife and even chasing cheetahs. Last August, a cheetah took refuge from guarding dogs in a tree and was later saved by local people. But not all of them are so lucky. Another threat comes from shepherds entering protected areas with the herds and also local people who poach wildlife for bushmeat.

2) *Road kills*: Cheetahs are being killed on roads; the Tehran-Mashhad road (between Shahroud and Sabzevar, marked in orange in Fig. 1d) is currently the most problematic one. In the last ten years, five cheetahs including a female with cubs have been killed on this road.

3) *Mining*: the extraction of natural resources is a problem especially in the southern habitats of cheetahs. Mining activities are making the area unsafe by increasing transit in the area and explosions are disturbing wildlife. Also the associated roads that are built to access the mines are making it easier for the poachers to enter remote areas.

4) *Climate change*: climate change is predicted to make current suitable habitats unsuitable in future and given that cheetahs have already lost a large portion of their habitats, this is threatening their future survival.

5) *Reliable protection*: Another problem not only for cheetahs, but for all the wildlife in Iran is the very few number of game guards. For example, two large protected areas (Naybandan WR 15,170 km² and Darband e Ravar WR 13,577 km²) have only six and five game guards respectively. With so little supervision, it is not possible to protect these vast areas. For instance last December, a cheetah cub was found in private house in Tehran being raised as a pet.

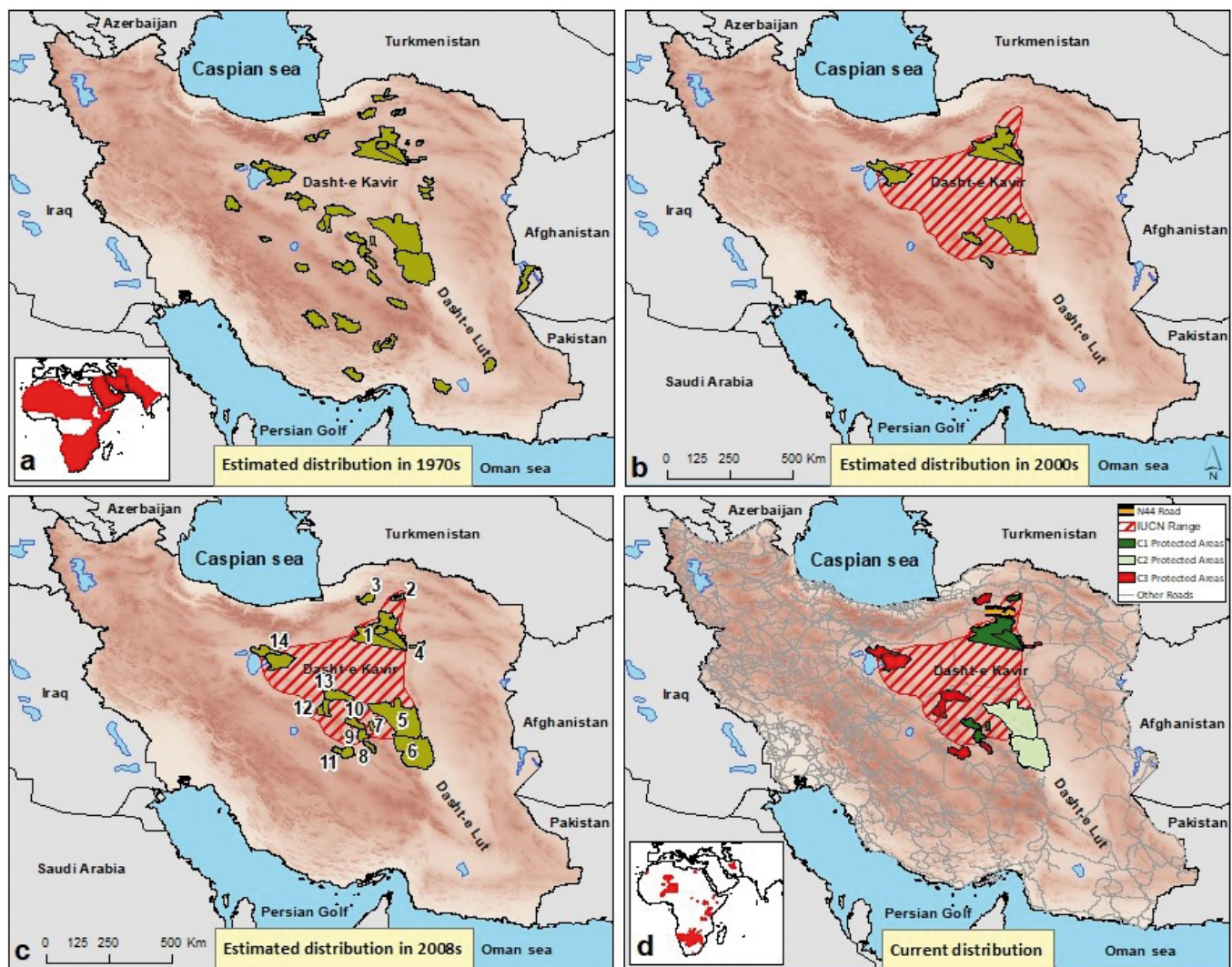


Fig. 1. Estimated distribution of Asiatic cheetah over time: a) in 1970s, b) in 2000s, c) in 2008s and d) current distribution. Small inset shows the global distribution of species in each time period. Protected areas in (c) are: 1) Touran Biosphere Reserve, 2) Miandasht Wildlife Refuge WR & Zamen e Aho National Park NP, 3) Khosh Yeylagh WR, 4) Darooneh Protected area PA, 5) Naybandan WR, 6) Darband e Ravar WR, 7) Kamki Bahabad Hunting Prohibited Area HPA, 8) Bafgh PA, 9) Ariz HPA, 10) Dareh Anjir WR, 11) Kalmard PA, 12) Siah Kooch NP & PA, 13) Abbas Abad WR, 14) Kavir NP & PA. Areas with confirmed recent records (C1 PAs), with confirmed records but in need of additional sampling to assess population status (C2 PAs), and with no confirmed record after 2014 (C3 PAs) are identified in (d).

Conservation measures

A number of conservation measures have been identified and classified based on urgent, medium-term and long-term actions.

Urgent: urgent actions are aiming to protect the remaining cheetah individuals. Cheetahs are highly dependent on their prey. In Iran it is mainly two gazelles – the Chinkara *Gazella bennettii* and Goitered gazelle *Gazella subgutturosa*, studies have shown that populations of both species have declined considerably. So we have to protect prey population and improve livestock management in protected areas to allow prey populations to recover. Roads should be safe-guarded to prevent the loss of more cheetahs. This has been started by putting warning signs but this is not enough. Both sides of the road should be fenced in areas

where we know the corridors are intersecting with the roads with the proper underpasses so animals can pass between habitats. The conservation of cheetahs should be seen beyond protected areas as they have very vast home ranges, by limiting protection to protected areas only, we cannot save cheetahs.

Medium-term: we have to improve our knowledge about cheetah ecology, their prey and biological traits so we can gather quantitative data and make informed decisions for the future.

Long-term: there have been proposals to build a conservation breeding programme although this idea is debatable and needs to be discussed further. There have also been proposals to develop a wildlife-livestock co-

existence strategy: a payment mechanism that pays herders for healthy wildlife population; as well as recover areas in more temperate zones to provide shelter for cheetahs in case the climate change makes their current habitat unsuitable. Areas like Khoshyeylagh Wildlife Refuge where in the past there were reports of sightings of seven cheetahs in a single day and when the vegetation was so high that the cheetah was almost not visible (Fig. 2 Up). But today due to over grazing, the area is highly degraded (Fig. 2 Down). These habitats should be recovered.

Implementation

To fulfill these measures we need:

Raising awareness (scientific): We need to raise international attention and the first step has been taken with the last issue of



Fig. 2. Up: Almost 40 years ago, in Khoshyeylagh WR, it was possible to observe seven cheetahs in one day and the habitat was very productive (Photo B. F. Darehshori). Down: Now the area is no longer suitable due to overgrazing (Photo G. H. Yusefi).

Cat News where the editorial was dedicated to Asiatic cheetahs and included three other papers about the species. Articles are also being published in journals with a broader audience but this is not enough and more people should know about the critical status of the cheetah in Iran.

Raising awareness (public): Raising national attention has already started by choosing cheetahs as symbol of our national football team. Recently an actress started a campaign called “cheetah forever” to buy the grazing rights inside Touran National Park. Many people have joined this campaign and it has become very successful with famous celebrities joining it. There have been seven

meetings with authorities and livestock owners and already two of them have agreed to move out of the national park. We need more of such activities.

Funding: The biggest portion of the CACP budget has been provided by UNDP. However, they have decided not to continue funding the Asiatic cheetah project. This is problematic for the future as this means that the CACP must function solely with the national budget which is limited and shared across all conservation projects in Iran. Lack of funding could be a threat for the future of cheetah conservation.

Political will: We need political will to be able to make long-term decisions and implement

them. We can then make a coalition of all stakeholders to develop an action plan and try to execute it in the long-term to save the cheetah.

Final remark

Studies show that cheetahs have lost a large portion of their suitable habitat (about 70%) within Iran, if this trend continues, we will lose cheetahs forever. This is a trend that has been seen with lions and tigers before and we do not want it to happen with cheetahs. Mitigation actions are still possible but they need to be addressed efficiently and urgently. Iran is the last place and we are the last generation that can prevent Asiatic cheetahs from going extinct.



© PWHF-CACP-DoE-UNDP, Touran Biosphere Reserve, Iran
 26.38 inHg | 23C | 05/12/2017 05:11AM CAMERA1



TANYA ROSEN

The ghost of the mystic mountains: Snow leopard conservation in Central Asia



Tanya is a cat conservationist in Central Asia and conservation adviser for the Illbirs Foundation in Kyrgyzstan. She is based in Bishkek, Kyrgyzstan. Her current work is focused on eliminating human-snow leopard conflict, supporting community-based wildlife management and understanding the scale of illegal trade in snow leopards and their endangered prey species.

Snow leopards *Panthera uncia* are very difficult to spot in the wild. They are elusive and are masters of camouflage whether it is walking, hiding and in snowy or rocky landscapes (Fig. 1). Other big cat species like lions, cheetahs and leopards are easier to count. Using

technology like camera traps and GPS collars, researchers can get a better understanding of the behaviour, home range, inter- and intra-specific interactions as well as important prey species. Learning about prey ecology gives an interesting perspective into snow

leopard habitat preference and therefore provide important information for conservation measures that can be implemented to save the species. The snow leopard's prey of choice in Tajikistan and Kyrgyzstan are markhor *Capra falconeri*, Marco Polo sheep *Ovis ammon polii* and Siberian ibex *Capra sibirica*. Despite being so elusive, difficult to study and to understand their basic ecology, snow leopards are easy to trap. One would think that given how endangered they are and how dominant human beings are in their landscape, snow leopards would learn how to avoid people. Sadly, snow leopards are creatures of habit and they tend to use the same paths repeatedly. This behaviour makes it easy for poachers; once a poacher has learnt the trails most used by a snow leopard, they can set up a trap, bait and capture the individual.

Like many species of big cats, snow leopards like wild prey; during periods of transition or in areas where prey densities are



low, they will readily prey on domestic livestock. In summer, snow leopards are known to prey on marmots in great numbers, while ibex and Marco Polo sheep are taken every two to three days. During the inter-season between fall and winter, snow leopards follow wild ungulates to lower elevations bringing them in close proximity to livestock. It is during these periods that snow leopards are known to opportunistically prey on livestock. While this in itself is an understandable behaviour, snow leopards sometimes get into a frenzy and will kill many individuals of domestic goats or sheep in one sitting. This is a huge economic loss for the herder who will inevitably kill the snow leopard and sell the skin and bones to recoup the loss of livestock. The mountains of Tajikistan and Kyrgyzstan are not the most agriculturally productive areas and people here live primarily off raising livestock. Because of the low productivity and difficult access to food, herders rely on hunting snow leopard's prey species to fulfil their protein intake. However, the use of

modern weapons when hunting ungulates has led to the decimation of these species. The collapse in wild prey species is one of the biggest threats to the survival of snow leopards in these mountainous countries. Moreover, increasing livestock herds compete with wild ungulates for natural resources also contributing to diminishing prey populations, severely impacting the snow leopard population.

The Panthera Snow Leopard Programme in collaboration with local NGOs are working together to find and provide solutions. These involve local communities, people who have traditionally hunted prey and poached snow leopards to help them understand that continuing to kill prey and predator can leave their families starving. Regulated off-takes of prey and income arising from regulated trophy hunting of ungulates provide positive incentives to protect prey and snow leopard populations. The partnership also tackles difficult problems like the

human-snow leopard conflict. This conflict is especially high in parts of Tajikistan, India and Pakistan. Predator-proof bomas or fortified corals have been successful in parts of Africa ceasing all conflict. These have been tried in Tajikistan and Kyrgyzstan with good results and are built with the help of local community conservancies. Corals cannot be built in great numbers and fast enough across the snow leopard range where there are conflicts. So, to address the problem of predation, temporary solutions are put in place. Fox-lights are deployed in areas of high conflict as a short-term action until predator proof enclosures are built. Along with protected livestock corals, snow leopard individuals which have killed sheep have been captured to be subsequently released to their home range with the permission of the local government. Over a period of one month in the Pamirs in Tajikistan, four different snow leopards have been released following livestock predation incidence and all have successfully turned back to wild prey.



Fig. 1. Snow leopard in Sarychat Ertash Reserve, Kyrgyzstan (Photo S. Kennerknecht).

Another key threat to the survival of snow leopards in their habitats is the illegal wildlife market. The combination of snow leopards killed in retaliation for livestock predation and the killing of snow leopards for the international wildlife trade is seriously threatening their population. There are countries where people display snow leopard skins on their walls or keep live animals as pets as a sign of wealth. Illegal wildlife trade is dangerous and difficult to crack. In Tajikistan and Kyrgyzstan, wildlife detection dogs are instrumental in detecting animals that are being transported illegally. Four wildlife detection dogs have been trained for the Kyrgyz customs service team. They have been trained to detect snow leopard, ibex, Marco Polo sheep and have been deployed at critical border posts. So far, the dogs have successfully exposed illegally transported argali and ibex trophies. One of the key to conservation success is the collaboration with local communities; protecting wildlife begins with them.

Conservation projects that actively include communities and offer economic incentives from legal activities tend to do well. Legal activities can range from ecotourism to promoting yak safari tourism to complement income from legal and sustainable trophy hunting.

In addition to community based conservation efforts, women empowerment is an important focus. A project has recently been initi-

ated to train local women as rangers, trekking and hunting guides (Fig. 2). The purpose is to bring women to an equal status as men as well as be models to encourage the next generation of girls in their communities.

The “next generation” initiatives also focuses on children to change their perception especially when it comes to appreciate wildlife for its intricate value rather than as an economic source. Valuing the natural world for its beauty is a vital change in attitude that should begin at an early age.

Conserving snow leopards requires multiple approaches: strong science is required to measure the impact of conservation activities and gain a better understanding of the ecology of a species that is generally quite elusive. But science has to be complemented by addressing and possibly resolving the root causes of what threatens the survival of snow leopards.

Engaging the local communities and helping them coexist with snow leopards is a critical step towards that.



Fig. 2. Young women from Bartang valley training to become wildlife rangers and eco-guides (Photo Panthera).

BRADNEE CHAMBERS

Introduction to CMS



Bradnee Chambers has been the Executive Secretary of the Convention on Migratory Species since 2013 and has worked in the fields of biodiversity, climate change and international law and governance, with several publications to his name. He previously headed the Law and Governance Branch of the Division of Environmental Law and Conventions at UN Environment's Nairobi Headquarters. Bradnee Chambers has degrees from the Universities of Edinburgh, Nottingham, Reading (UK) and Windsor (Canada).

The Convention on Migratory Species CMS is a UN-based convention which came into force in 1983. It is an international treaty which has been growing very quickly, recently attracting members from different parts of the world. The Convention works through an appendix system where if a species is put on Appendix I, this designates it as an endangered or highly threatened species. It requires that governments put in place obligations to make sure that there is no harvest or hunting of that species – of course with a few exceptions for indigenous people and for scientific purposes. Basically, it is a strict obligation of no taking. Examples of species that are listed on Appen-

dix I include the snow leopard and cheetah. Appendix II is a list for species where sustainable use is allowed. It basically means that, where the species is moving between international boundaries, the Range States should put in place a strategic management plan to be able to protect the species. At the Conference of Parties COP 12 in Manila in October last year, the Convention successfully listed the lion and the leopard on Appendix II.

The Convention likes to say that its species run, fly, swim (Fig. 1):

They run: Terrestrial species are under threat from an array of different pressures – climate

change, habitat loss, barriers to migration, poaching, just to mention a number of threats.

They fly: The Convention mainly works in three large fly-ways: the African-Eurasian flyway, the American flyway, and the Austral-Asian flyway and increasingly within the Central Asian flyway. Examples of species that are very long migrants include the osprey, Arctic tern and bar-tailed godwit. These species are under threat from an array of different pressures such as poisoning, illegal killing, electrocution, and interestingly enough from the deployment of renewable energy developments particularly wind farms and powerlines that have become an issue in terms of their placement in important migration routes.

They swim: Marine species also figure in the appendices and include different cetaceans, sharks and rays which in many cases are global wanderers. They are under threat from a number of different pressures including from by-catch, marine debris and pollution (an important one these days) as well as underwater noise.

CMS is not as large a convention as CITES but it has been working hard to expand. There are currently 126 core members with a promise of five more South-East Asian countries committed to joining in the future. There are gaps, one of the largest is in North

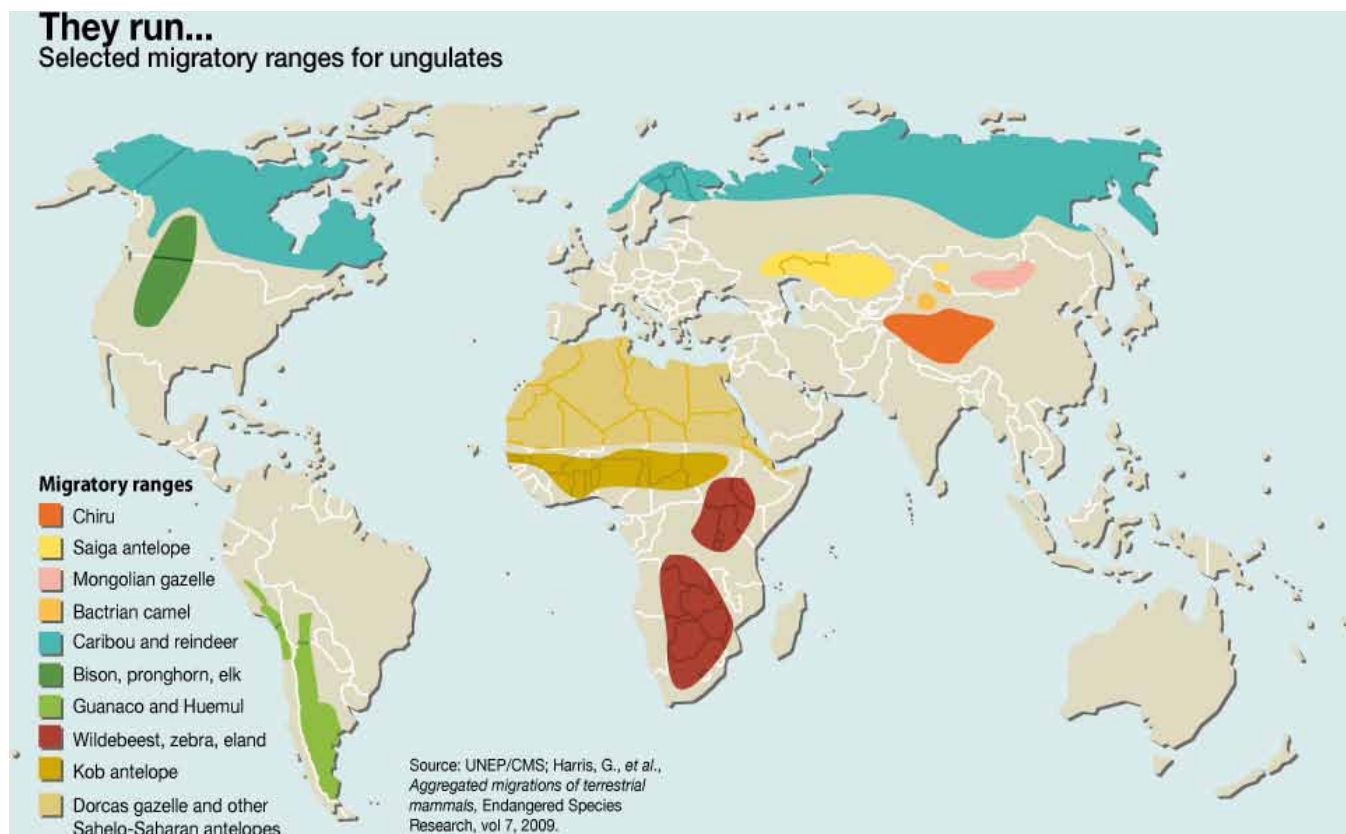


Fig. 1. "They run": map of mammalian migratory species.



Fig. 2. Humpback whales can migrate up to 25,000 km each year. Arctic terns have been known to fly up to 90,000 km during their migratory trip from their winter grounds and back. Some species of Manta ray migrate seasonally making them vulnerable to many threats (Photos V. Mignon, S. Dereliev, G. Stevens).

America with the United States but they are deeply involved in work on sharks and sea turtles. Canada is very interested in joining us these days. We have gaps in terms of a few countries in Latin America and the Caribbean, a few in Africa, and we have a large gap in Asia.

Since this is where the Convention needs to focus its work, it has helped that the last COP was in Manila and the next one will be in India. This will hopefully inspire some of these Asian countries to join CMS in the coming years. In total, including all of the countries that are working in daughter agreements, MOUs (soft law agreements that work on specific species) there are actually close to 160 parties that are engaged in CMS.

There are legally-binding agreements (e.g. petrels and albatrosses, European bats, large and small cetaceans, gorillas, waterbirds). There are 19 non-legally binding MOUs which range from species-specific undertakings such as the one dealing with the aquatic warbler to wider scope agreements such as grassland birds of South America.

The Convention is a multi-lateral environment agreement; at the core is the decision-making body, the Conference of Parties. It meets every three years and decides on listing species as well as moving forward on different policy initiatives and decisions. In the interim between the three-yearly Conferences, there is a

Standing Committee which is regionally represented. It provides policy guidance and takes decisions when the COP cannot meet. There is a very active Scientific Council that provides scientific support and information to the COP in terms of its decision making. The Scientific Council meets between COPs as a Sessional Committee: a representative selection of the membership of the Scientific Council responsible for implementing the mandates assigned to the Scientific Council by the COP. It is an interesting Scientific Council because it is made up of scientific councillors from every country but it also has a number of specialists called "COP Appointed Councillors" some of whom work on particular species while others work on crosscutting issues. The Secretariat is based in Bonn, Germany. The Convention is sometimes referred to as "the Bonn Convention" because that is where it was negotiated and signed.

The Swiss Government has been instrumental in supporting the Convention in making a huge step forward last year at its COP by agreeing to set up a Review and Compliance Mechanism. In many ways this is going to be a game-changer for the Convention ensuring that what is being put onto the appendices will actually be implemented and enforced. This will be a review mechanism that will look at the core obligations under CMS and make sure that they are being followed. It will allow NGOs to raise cases within the

mechanism. It is also something that has been linked to the negotiations at the COP to a national legislation programme, similar to what CITES has successfully had for a number of years. This will hopefully ensure that much more effective conservation work can be promoted. Especially when a country has newly ratified, it is important that it follows up with the implementation laws and regulations, to actually put them on the books to ensure the conservation measures that will protect the species at the national level can be delivered.

CMS is dedicated to helping countries come together to manage and protect their shared wildlife.

About the Convention on Migratory Species

The Convention on the Conservation of Migratory Species of Wild Animals (also known as CMS or the "Bonn Convention" after the city in which it was signed) aims to conserve terrestrial, aquatic and avian migratory species throughout their range. It is an intergovernmental treaty, concluded under the aegis of the United Nations Environment Programme UNEP, concerned with the conservation of migratory wildlife and their habitats on a global scale.

For more information please visit: www.cms.int

SABINE HERZOG

Politically fragmented living space: The Convention on Migratory Species as an instrument for transboundary cooperation



Sabine completed her MSc in Biology systematics and ecology, at the ETH Zurich in 1999. She then carried out fieldwork in different parts of the world including South Africa, Ecuador and Switzerland. In 2016, she completed an MBA with a focus on public management. She is responsible for the wildlife reserves at the Federal Office for Environment in Switzerland since 2008.

The Convention on Migratory Species CMS or Bonn Convention is an international environmental treaty which focuses on the conservation on migratory species and their habitats. The Convention entered into force in 1983 and has its headquarters in Bonn, Germany. Switzerland has been a Party to CMS since 1995 and has since signed treaties under the CMS Family umbrella, such as the African Eurasian Waterbird Agreement) AEWAs and the Agreement on the Conservation of Populations of European Bats EURO-BATS. Switzerland is also a signatory to the Aquatic warbler and Birds of Prey (Raptors) Memorandums of Understanding MOUs.

There are four big cat species protected under this UN Convention: lion, tiger, snow leopard and leopard. The snow leopard was listed on Appendix I (endangered migratory species) since the first Conference of Parties COP in 1986. In 2009 another endangered cat: the cheetah was also listed on

Appendix I. The lion and leopard were both listed on Appendix II (species in an unfavourable conservation status which require international agreements) at the last COP in Manila in 2017.

Landscapes provide the much-needed habitats for species to live and move around: one of the world biggest, continuous steppe landscape occurs in Central Asia, and has diverse habitats ranging from dry deserts to grasslands to mountain ranges. This large uninterrupted track of land provides habitats which are unique and still comparatively unspoilt. As many migratory and nomadic mammals rely on this ecological important migration hotspot, protecting these areas is of crucial importance for the conservation of the Asiatic mammals.

A scientific paper published in 2009 states that the Central Asian desert biome is greatly under-represented in the global net-

work of protected areas. The Convention on Biological Diversity CBD sets targets of 10% for protected area coverage but currently only 2.16% of the Central Asian landscape are designated as protected areas.

Besides habitat loss, migratory mammals are particularly at risk from linear infrastructures and fences. Additionally, large felids and their prey face rapidly growing threats which include livestock depredation, over grazing, bushmeat, poaching, illegal trade and mining.

The CMS addressed the issue of protecting these migratory mammals and their habitats and strengthening transboundary cooperation in the region by creating the Central Asian Mammal Initiative CAMI. The goal of this Initiative is to coordinate conservation activities for 15 species in 14 countries, many of them in a profoundly unsatisfactory state. The 14 countries involved in the initiative include Russia and China, which are not Parties to CMS. This shows the flexibility of CMS instruments, which countries can participate in without becoming a Party to CMS, and that such a transboundary initiative can create goodwill and cooperation in regions where it is often difficult to talk or act across borders.

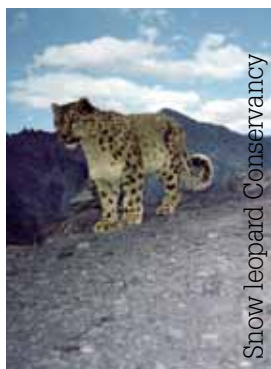
The objectives of the CAMI programme are:

- 1) address the key conservation threats and issues in the target region
- 2) guide planning and implementation of prioritised conservation actions at a regional scale
- 3) facilitate knowledge exchange, communication and promotion of synergies
- 4) support implementation, coordination and resourcing of the CAMI

Priority areas for action are: eliminating barriers to migration, countering poaching and illegal trade, supporting scientific re-



M. Pittet



Snow leopard Conservancy



P. Meier



P. Meier

Table 1. The goal of the Big Cat conservation measure is to secure at least 20 important snow leopard landscapes across the species' range by 2020 (Photos Panthera, A. Davletbakov, F. Heidari.). For more information visit: www.cms.int/cami.

Snow leopard and argali	Asiatic cheetah
Cooperation with GSLEP and their “20 by 2020” landscape programme	Increase number and/or size of protected areas in Iran
Argali sheep are a major food source for snow leopards. A technical workshop to review and update the CMS Argali Action Plan, with government officials and experts is planned for 2020	Enhance effectiveness of protected areas through corridors and a landscape approach (important for cheetah and their prey)
Barriers to migration routes of snow leopard and argali were mapped during the Migration Atlas workshop in 2017, which identified the corridors where snow leopards move and existing linear infrastructure threats	Conserve and enhance prey populations (chinkara, goitered gazelle)
International workshop on “aspects of transboundary snow leopard conservation in Central Asia” in 2014	Collect information on distribution and threats
Project to monitor illegal trade in saiga, argali and snow leopard derivatives	Conduct cheetah workshop and develop regional programmes (there are difficulties at the moment but there should be a workshop to develop a regional programme for the species)



Panthera



A. Davletbakov



F. Heidari

search and integrating findings into actions on the ground, and helping countries uptake the findings into their legislation and development plans.

Switzerland has helped with the funding of three projects that fulfil some of the mandates of the CAMI Program of Work (Guidelines for addressing the impact of linear infrastructure on large migratory mammals of Central Asia, a Migration Atlas that maps the migrations routes and barriers across Central Asia, and a fence removal project along the Trans-Mongolian railway).

In 2018, the Swiss government supported a CMS project to conduct a pilot study of the wild camel population near the Mongolian-Chinese border. This species is only found in China and Mongolia, near the state border, which separates the two populations. The study can serve as a first step in developing a bilateral approach for the management of this species.

Additionally, an upcoming project supported by Switzerland will analyse new patterns

in illegal trade in saiga, argali and snow leopard derivatives and inform enforcement agencies and enhance cross-border information exchange in five countries in Central Asia.

The CMS is an important instrument and has the potential to increase regional cooperation. The CMS Conference of the Parties (COP12) in Manila resulted in two important Decisions related to examining borders and improving mobility for migrating species: one for Transfrontier Conservation Areas for Migratory Species (Decisions 12.94–98) and one for Improving Ways of Addressing Connectivity in the Conservation of Migratory Species (Decisions 12.91–93).

“Transboundary activities under CMS have a great potential to increase regional cooperation for conservation that can make a real difference to Central Asian mammals, their habitats and the people who life together with them on the same land.”





LUCAS LEUZINGER

Living with jaguars: ranching, tourism and conservation



Lucas obtained a master's degree in Molecular Biology from the University of Zurich. He then worked as a photographer and scientific consultant for the BBC of Bristol. In 2003 he and his wife Marina founded the Barranco Alto lodge in the Brazilian Pantanal. Managing the lodge included a ranch with cattle, eco-tourism and research on jaguars and their impact on cattle ranches.

Jaguars *Panthera onca* are the only member of the Panthera Genus in the Americas. They are similar in size to the small tigers of Russia with an averaging weight of 130 kilograms. Only in the Pantanal, large males can reach up to 145 kg, but the average weights are below that at around 100 kg. In other parts of their range such as in Mexican rainforests, jaguars weight on average 70 kg. They are listed as Near Threatened on the IUCN Red List of Threatened Species. Jaguars were historically distributed from the southern parts of the United States to the northern areas of Argentina. Today, the jaguar population is reduced to three populations in Central Ameri-



L. Leuzinger

brackish water. They contribute to increasing the biodiversity as they have their very own ecosystem.

This region of the Pantanal is bordered in the South by a pristine river the Rio Negro which, as its name indicates, has waters which appear black. It is an isolated river protected by two large swamps and there is no access from other rivers into this river making it a very pristine part of the Pantanal.

The Fazenda Barranco Alto has four main economic activities: traditional cattle ranching, eco-tourism, research and conservation (Fig. 1 & 2).

Cattle ranching

The cattle ranching at Barranco Alto is based on an almost 200-year old tradition characterised by low cattle densities and the use of natural grasslands for grazing as opposed to logging forests and replacing it with grass. Like other places in the Pantanal, the cows originate from India. Although most of the problems focus on jaguars, pumas fall in the same category and tend to cause comparable trouble. When the Leuzingers arrived in the area in the early 2000's and before people actually investigated the kills in depth and made statistics, people would always blame jaguars as the cause for any cattle mortality. But based on locally collected data, it is obvious that in approximately 80% of the cases, the mortality is not caused by jaguars. The approximately 80% of cattle deaths are mostly management-related causes. Of the whole herd, ranchers in the region loose about 0.1–4% (avg 0.5%) of their cows depending on the area, how far in the forest and where the ranch is located. The average figure for cattle killed by jaguars and pumas on Fazenda Barranco over the

last 15 years was about 0.5% of the herd per year. This figure puts the whole issue into a new perspective.

Over the years, the Fazenda Barranco Alto has been implementing management practises that reduce the chances of depredation of cattle by large predators. Jaguars tend to hunt along rivers and lakes, catching capybara and caiman opportunistically. Placing cattle herds away from habitats preferred by jaguars decreases the chances of opportunistic kills. Other management practices focus on mother cows- placing them inland in safe areas, establishing defined calving seasons and genetically selecting for good mothers which defend their calves. Defined calving seasons not only reduces the chance of losing calves to predators but also increase economic success.

Research at Barranco Alto

Barranco Alto supports research and has a research station where researchers from all over the world are hosted. Projects range from ecology to geology and the researches come from universities like Stanford, University of Cologne, University of São Paulo and Universidade Federal do Mato Grosso do Sul UFMS. Early research efforts were on a small scale and opportunistic. Over time, the methods and efforts became more professional especially with the foundation of the "Projeto Oncas do Rio Negro", a project based on Barranco Alto and the neighbouring farm Fazenda Vera Lucia in partnership with the Jaguar Conservation Fund. Through this project, camera traps were set up on the 600 km² area and served as an initial inventory of how many jaguars and prey species were present in the analysed region. This was followed by more in-depth studies, capturing jaguars and pumas and fitting them with radio and then

ca, the Amazon which hosts the biggest population and the Pantanal.

The Pantanal is the world's largest wetland, bigger even than the Okavango Delta. It is in the heart of South America. The Fazenda Barranco Alto is located in what can be called the heart of the Pantanal. It is a vast mosaic of wetlands, lakes, tracts of forests, open grasslands and swamps. It is an ideal habitat for a very high biodiversity and the open grasslands also make the biodiversity visible which is not often the case in the tropics. Some of the lakes on the ranch, called Salinas, are soda lakes or alkaline lakes with



Fig. 1. Researching jaguar populations involves collaring individuals on the ranch (Photo L. Leuzinger).



Fig. 2. Cattle are moved from place to place to allow regeneration of land and avoid predator habituation.

GPS collars. The data was shared with the Federal University of Mato Grosso do Sul, the local university which has little funding opportunity. The data was also shared with the Jaguar Conservation Fund, a Brazilian NGO. With this initiative, the project covers an area of 2,000 km² and includes camera trapping and collared felids to determine how much of the prey composition is made up of cattle and where kills are more likely to occur.

Dogs on ranches

Dogs have long been used in the Pantanal to track and tree jaguars to facilitate their elimination. Banning dogs has been an important management practice. Local cowboys and poachers would find it nearly impossible to find jaguars without the help of the dogs and can therefore not kill these predators. Despite longstanding myths that cattle ranching in the Pantanal is unsuccessful without dogs, Barranco Alto functions perfectly without them. Dog vaccination and sterilisation programmes are offered to the ranches in the area. These programmes give the project

heads an idea of the number and breeds of dogs present in the area.

Ecotourism

Running a ranch sustainably and supporting research and conservation activities requires steady funding. With an average of 500 guests per year, interested in visiting the farm, contributing and participating in projects on site, they generate a lot of work and income for local families, especially women, who would otherwise have few working opportunities. Ranching is mostly a male-dominated activity with very few cowgirls. The women therefore tend to work in the lodges in hospitality and tourism-related activities providing additional income to the local households.

Conservation: conservation is becoming an incipient economic activity in Brazil and Barranco Alto is slowly getting financial returns for preserving the forest and not logging it. Credits can be sold in return for not logging. Very recently, new environment laws have been passed in congress that allow for forest

compensation across the country, i.e farms in good conditions tend to have less forest reserves than the law demands (20–80% depending on the biome, 20% in the Pantanal) and therefore have to compensate with forested areas elsewhere. Barranco Alto has about 50 km² of forest in excess. The certificates over the excess can be traded.

Today, there are three lodges on the 2,000 km² of the project and ecotourism has to be carried out in a sustainable way, balancing profits with environmental impact caused by tourism. The advantage of working on private land is that some of the profits go back into research and education programmes rather than end up in the pocket of a few big tour operators.

The participants of the project strongly believe that conservation efforts that result in true sustainability are only achieved if the local community can make a fair economic profit, when their opinions and needs are taken into account and the long-lasting presence of the conservation-driving force is guaranteed.



Education and training programmes: The project also includes education initiatives and training programmes for all the families on the combined 2,000 km² land. The cowboys are regularly convened for meetings where they are taught better management practices and horsemanship courses which is a good way of earning their attention and respect. In a second step, the cowboys are introduced to the importance of wildlife and their role in the environment.

Medical services: twice a year, a free dentistry service is organised through the project to treat people on the ranches. The dentists come from the University of Campo Grande and offer their expertise to people included in the project.

Next generation: raising awareness and educating children about wildlife and teaching them to see animals as a positive aspect rather than as a threat is important for the future of wilderness on ranches. Teachers at two different schools help convey the message to the students which is undoubtedly shared with the families.

REINHARD SCHNIDRIG

Management for conservation: maintaining lynx in a human-dominated landscape



Reinhard obtained a PhD in wildlife ethology from the University of Bern in 1994. He then pursued a career as a wildlife biology consultant for federal and cantonal authorities and wildlife filmmaker for Swiss television. Since 2005, he is the head of the Wildlife and Forest Biodiversity Section of the Swiss Federal Government.

Although one might think that most wildlife and large predators issues only happen in faraway places, conflict with wild cats can happen closer to home. Switzerland is a small country with an area of only 42,000 km² and a population of eight million. And this small but densely populated country is also home to a wild cat species, smaller than the lion or the leopard, but nevertheless just as beautiful as all the other big wild cat species. This is the story about the lynx *Lynx lynx* in Switzerland.

Historic eradication

The story of the lynx in Switzerland actually begins sadly with an eradication chapter. About 200 years ago, Switzerland lost all of its wildlife species from the large herbivores like the red deer *Cervus elaphus*, roe deer *Capreolus capreolus*, chamois *Rupicapra rupicapra*, ibex *Capra ibex* and wild boar *Sus scrofa* to the predatory species like the wolves *Canis lupus*, bears *Ursus arctos* and lynx. This biodiversity crisis not only happened in Switzerland but in the whole of Central Europe.

The main causes for the eradication of lynx and other wildlife in the country were direct persecution, habitat destruction, livestock grazing in forests (increasing competition for resources with wild herbivores) and an unregulated hunting of prey species. The progressive loss of lynx can be seen in maps recording lynx presence dating back to the 1700–1909 (Fig. 1).

Recovery and reintroduction

In 1876, over-exploitation of the natural resources changed the state of wilderness in the country rapidly. Two important conservation legal guidelines were implemented: the first law on forest protection and the second on hunting. There was a need to first reco-

ver and protect the forest to support the return of large mammal species followed by a regulation on hunting. At that time, hunters were the “problem” as there were no quotas or laws to limit the damage caused by this activity.

As a result of the two laws, forests recovered and large ungulate species populations followed. The data shows a steady increase of the population of three species – roe deer, chamois and red deer, based on hunting bag statistics from the last hundred years. Interestingly, the graph shows a significant dip in the chamois population in the last twenty years. It is important to note that this is not only caused by the return of predators but also because of interspecific competition with ibex as well as excessive touristic activity in their preferred habitats.

This incredible return of the wild ungulates was followed by the return of large predators like wolves and allowed for the “assisted” return of the lynx.

Lynx population development

The lynx had to be actively reintroduced with the help of specialists, NGOs and with the consent from the government. In 1967, following the approval from the Federal Council and following a vote, the Canton of Obwalden decided to reintroduce the lynx. After this initial project, lynx were released in the Jura Mountains, in the western and finally in the eastern Swiss Alps. The current lynx population stands at an estimated 300 individuals, thereof about a 100 kittens born each year.

Legal enactment

Successful wildlife conservation consists of several elements including a solid scientific

base, sound legal instruments and a strong political will. Without the political support, the decisions fixed in legal enactments cannot be implemented. The Federal hunting law, federal hunting ordinance, cantonal hunting laws and bylaws, and the Swiss Lynx Concept are examples of the different levels and types of regulations in Switzerland.

The reintroduction of lynx in Switzerland was a political decision and therefore a number of groups were created to provide the necessary legal and scientific support. A large carnivore working group operates at the national level while different interest groups work at cantonal levels. Wildlife do not follow human-made demarcations such as cantons and cantonal borders, therefore for the purpose of effective conservation, several “compartments” were defined which take into account the spatial needs of the species. There are currently five such compartments for large predators and each of these has a dedicated commission that makes and implements decisions at a scientific and legal level.

Swiss Lynx Concept

The Swiss Lynx Concept consists of four parts based on a hierarchy of importance and necessity. The first aspect of the concept focuses on the lynx as a protected species. Switzerland is a human-dominated landscape so the second and third aspects – damage prevention and compensation – pertain to human-livestock-lynx dynamics. Quote by spea-

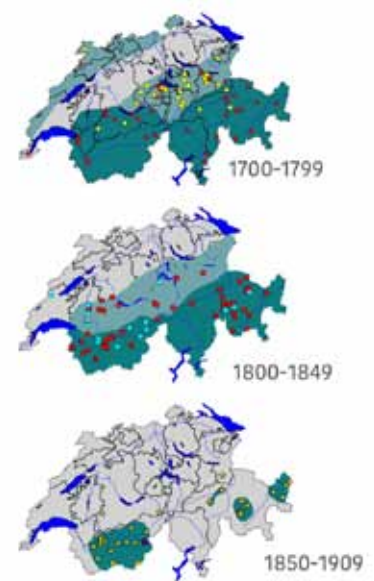


Fig. 1. Map of progressive lynx eradication in Switzerland 1700–1909. The last lynx was observed in 1909 (Breitenmoser & Breitenmoser-Würsten 2008).

ker: "it is not fair if some individuals have to carry the burden while others just want the species back. We have to help those people that are concerned with those burdens." The last part covers the issue of population regulation measures.

i) Species Conservation: the lynx is a protected species under Swiss federal law. Lynx monitoring is a key element of the Swiss Lynx Concept; population size and trends are surveyed using camera traps. One key element in species conservation is providing enough suitable habitat which has the necessary connectivity. Ensuring connectivity to maintain the diversity of the species and other ecological aspects is vital for the viability and survival of the lynx. Building ecological bridges is an example of the actions that can be taken to increase connectivity between habitats especially where they are fragmented by man-made infrastructures like highways. The lynx is a fairly poor coloniser, tending to remain in optimal habitats which have a good prey population. To support the recolonization of the lynx across the Alps, the Swiss Lynx Concept in collaboration with international NGOs supports translocation projects.

ii) Damage prevention and compensation: the topic of damage prevention and compensation begins by reducing or eliminating the causes. Lynx have caused few incidences in terms of livestock predation with some exceptions. Over the last 20 years, seven individual lynx who focused on livestock prey were shot by game wardens. Today livestock predation by lynx is nowhere a major problem. These types of conflicts tend to be caused by the wolves. Farmers whose livestock has been predated on by large carnivores are compensated – the Federal Office pays 80% of the cost while the canton responsible for the territory covers the rest of the amount.

iii) Intervention/regulation: the Swiss lynx Project foresees the over-development of the lynx population in the country and therefore includes a clause to intervene at the population level should the need arise. This has not been required so far but the option is available. A number of pre-conditions have been determined for the lynx population before the topic of intervention can be addressed. The basic density has been set at 1.5 lynx individuals per 100 km², below this density, interventions cannot be considered as it could damage the lynx population irreversibly. An active involvement in controlling the lynx



Fig. 2. Camera traps are used to monitor the lynx population in Switzerland. Studies have shown that the best established lynx populations are found in the Northwestern Alps and the Jura (Photo KORA).

population would be examined in the case of a significant decrease in the prey species population. If the decrease is directly linked to lynx activities, there is the possibility to remove one lynx per documented reproduction, by culling or by translocation. Germany, Austria and Italy are actively expanding their lynx population; Switzerland has the possibility to regulate its own lynx population by translocating individuals to these neighbouring countries. Culling of lynx is not been required in the past few years, but the topic is under discussion in the political arena.

Lynx monitoring

An essential aspect of the Swiss Lynx project is the availability of robust monitoring. The KORA "Carnivore Ecology and Wildlife Management" headed by Christine and Urs Breitenmoser has a long-term project monitoring the development of the lynx ever since it established a stable population in the country (Fig. 2). The monitoring is carried out using 60–100 camera traps deployed over a duration of about 60 days. Lynx coat patterns are like human finger prints; each individual have a different pattern making them recognisable and simple to make population estimates. The population development in the compartments can be examined. The decisions and interventions formulated by the Swiss lynx project are based on these data.

International cooperation

The Swiss Lynx Project is not confined to Switzerland but encompasses all the Alpine countries who are working to reintroduce the species. Switzerland was the first Alpine country to re-establish a lynx population and feels a responsibility to the international perspective of the return of this large predator across the Alps. The Swiss lynx population is

the source of the lynx in the Jura Mountains in France and Swiss lynx have been used to reinforce the small populations in the Tarvisio in Italy as well as in Central Austria. For large predators like the lynx and wolf, no single country can be considered alone; the species whole range, in this case the Alps need to be the focus and the monitoring needs to be harmonised across the different countries.

The Recovery of Wildlife in the Alps is an international project (RowAlps-project) aimed at a harmonious return of large predators like lynx and wolf across the Alpine region. The project goals of presenting practical conservation and management options for lynx and wolf are reached through three aspects: biological, human-wildlife interactions and achievable management options. A three-year discussion among representatives of all the countries involved in the RowAlps resulted in a list of recommendations for an internationally coordinated management across the Alps. Among Switzerland's agreed roles is the capture and translocations of lynx to populate other parts of the Alps. An important topic considered by the RowAlps is the genetic diversity and management of lynx. The founder population of lynx are small and needs to be monitored and managed closely.

Conclusion

Robust science and management are important criteria for successful wildlife conservation but alone they are not enough. People need to care. Forty years ago, a group of people in Switzerland cared enough to reintroduce the lynx and maintain a healthy population. Raising people's awareness and interest in wildlife topics can help conserve large and difficult predators like wild cats in Switzerland and around the globe.



CATnews Special Issue 12 Autumn 2018

1. Introduction to the World Wildlife Day 2018 by Claude Martin	03
2. Priorities for conserving the African lion by Luke Hunter	04
3. CITES Introduction to WWD by Juan Carlos Vasquez	07
4. Trade and Big Cat Conservator: the Convention on International Trade in Endangered Species of Flora and Fauna by Matthias Lörtscher	08
5. Tigers in India versus Russia: conservation at the extremes by Dale Miquelle	11
6. Money makes the tiger roar: IUCN's integrated tiger habitat conservation programme by Sugoto Roy.....	14
7. World Wildlife Day 2018 in Pictures.....	16
8. Leopards, camels and frankincense: the Arabian leopard of Dhofar, Oman by Hadi al Hikmani	18
9. Scale of threat: The IUCN Red List Assessment by Tabea Lanz	21
10. Status of Asiatic Cheetah in their last refuge – Iran by Leili Khalatbari.....	23
11. The ghost of the mystic mountains: Snow leopard conservation in Central Asia by Tanya Rosen.....	26
12. Introduction to CMS by Bradnee Chambers.....	29
13. Politically fragmented living space: The Convention on Migratory Species as an instrument for transboundary cooperation by Sabine Herzog	31
14. Living with jaguars: ranching, tourism and conservation by Lucas Leuzinger	34
15. Management for conservation: maintaining lynx in a human-dominated landscape by Reinhard Schnidrig.....	37



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

