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Policy for human-leopard conflict management in India

A national workshop was held 23-24 January 2007 in New Delhi, India to develop a pragmatic management policy for human-leopard conflicts in problem areas. The Ministry of Environment and Forests (MoEF), Government of India, the Wildlife Trust of India (WTI) and the International Fund for Animal Welfare (IFAW) jointly hosted the workshop. Over 25 participants attended, including scientific experts who have worked with leopards and other carnivores in India and abroad, and Chief Wildlife Wardens and Forest officials from Maharashtra, Gujarat, Assam, Uttaranchal, Himachal Pradesh, and Jammu and Kashmir. Topics of the workshop included status reports from States, overview of leopard ecology, legal issues of handling the species, and the formulation of a national policy for human-leopard conflict management.

Leopard *Panthera pardus* management in India is facing many challenges. Leopards have highly diversified diets and are extremely adaptable to various ecological conditions (Daniel 1996, Hayward et al. 2006). This versatility allows them to thrive in a broad range of habitats, often bordering human settlements. In recent years the presence of leopards has been increasing in a wide range of rural and even built-up environments, far removed from natural habitats and protected areas. Although leopards have shown a remarkable ability to live relatively peacefully close to people, conflicts can and do occur, with leopards killing livestock and in extreme cases people.

Due to fear and anger, many affected persons retaliate by injuring and killing leopards (Karanth & Madhusudan 2002) and demanding that authorities take action. Because Indian law prohibits the killing of schedule 1 species, responses have been confined to removing the animal to captivity or translocating it to a new area. Holding animals in captivity

is expensive and is associated with many welfare issues. The success of translocation is under much discussion as there is no available habitat and emerging data indicate that translocation may actually lead to an increase in serious conflicts (Athreya 2006). A thorough review of strategy is therefore required to address every possible human-leopard conflict situation and develop appropriate protocols for response.

Leopard Distribution in India

Leopards are the most widely distributed large felid. In India, leopard are widespread in a range of natural and human-dominated landscapes. Twenty-five of the thirty-five Indian States and Union Territories have confirmed the presence of leopards. Leopard counts are fraught with uncertainty, but official data from 16 states indicates that the population is increasing. Similarly, India's human population grew by 34% between 1991 and 2001 (Office of Registrar General, India 2007).

Status Reports from States

Due to increased conflicts between humans and leopards, forest officials were asked to present the current situation of leopards in their regions. Six Chief Wildlife Wardens from the states of Maharashtra (Mr. B. Mazumdar), Gujarat (Mr P. Khanna), Assam (Mr. M. C. Malakar), Uttaranchal, (Mr. S. Chandola), Himachal Pradesh (Mr. V. Tandon), Jammu & Kashmir (Mr. A. K. Srivastava from Jammu & Kashmir) gave presentations, each representing States where human-leopard conflicts are elevated. The wardens all presented figures on numbers of human deaths caused by leopards during recent years. Table 1 presents annual data reported from six of the regions by State forest officials on human killed by leopards and leopards killed. The attacks were all occurring in human dominated landscapes as it appears that there is an increasing occurrence of leopards in these landscapes as well as an increased human encroachment on leopard habitats. Tensions were reported to be high in areas where attacks occurred, with constant demands for the Forestry Department to act, which in most cases meant either removing leopards to captivity or translocating leopards. Substantial numbers of leopards were also reported as being killed through retaliatory killings. The wardens expressed a clear need for a more sustainable strategy.

Global Scientific Community

Researchers and scientific experts from India and abroad spoke extensively on human-carnivore conflicts in various parts of the world. They highlighted, among other things, the lack of extensive scientific research on elusive, territorial carnivores like the leopard. Vidya Athreya from the Kaati Trust of India, brought up a very important consideration for the relocation of wild leopards. Leopards are highly territorial animals and when displaced, they have a tendency to seek out their original territory, which may be hundreds of kilometers away. In this process, the leopard can often run into numerous human-dominated landscapes and cause more problems for which it had previously been caught. The movements of relocated leopards must be properly monitored so that trends may be observed. If relocation causes more problems than it solves, human-leopard conflicts must be resolved in another way. During relocation, proper procedures must be used in order to safely trap the leopard and assess its health and future prospects. Dr.

Table 1. Number of humans killed by leopards and leopards killed annually in six Indian regions (2000 -2007) as presented by State forest officials.

Region	Victim	2000	2001	2002	2003	2004	2005	2006	2007
Gujarat	Human	-	8	14	20	4	4	-	-
	Leopard	-	42	37	40	24	25	-	-
Jammu & Kashmir	Human	-	-	-	-	-	-	-	-
	Leopard	-	-	-	-	1	2	11	3
Assam	Human	-	-	-	-	-	0	0	-
	Leopard	-	-	-	-	-	3	5	-
Uttaranchal	Human	4	40	33	40	45	36	41	0
	Leopard	10	92	81	72	53	57	54	4
Maharashtra	Human	-	-	-	-	-	-	-	-
	Leopard	-	-	-	-	20	9	4	-
Himachal Pradesh	Human	-	-	-	0	0	0	4	2
	Leopard	-	-	-	14	22	17	14	6

Aniruddha Belsare, a veterinary officer, spoke on the capture and post-capture management strategies for leopards. He pointed out many wrong practices carried out today such as foresters not using chemical restraints to capture leopards. This procedure not only injures the leopard, but can also put people in danger. Belsare recommended adequate training and exposure to handling wildlife properly. After capturing the animal, it must be transported securely in a locked cage. He also recommended microchipping the animal for identification purposes.

Additionally, experts on various other large carnivores lectured at the conference. Ravi Chellam, who has worked with Asiatic lions, noted the problems these species face while trying to coexist with people. Asiatic lions are highly endangered species and are found in the Gir National Park in Gujarat. A problem of concern is that 82% of human deaths caused by the lions are reported outside the park. These deaths are also reported seasonally, with the advent of the monsoons. Chellam discussed the role of science in conservation and the lack of research and monitoring of large cats in India. He also noted there is a difference between saving individuals of a species versus conserving populations and maintaining the integrity of habitats. The latter approach will yield long term results.

John Linnell and Laurie Marker spoke on human-animal conflicts in regions other than India. Linnell is involved in large carnivore conservation in Europe and noted that a major issue there is livestock depredation. In Norway, it is estimated that 40,000 sheep are killed per year. Due to such high losses, carnivores are often perceived as competitors to farmers and ranchers. In Europe, all large car-

nivores must live in human-dominated landscapes as protected areas are too small and human presence is even significant within them. As a conservation strategy, Linnell proposed involving the stakeholders in conservation and increasing the dialogue between scientists and wildlife managers in order to decrease conflicts. Linnell also discussed the potential for hunting and lethal control of carnivores to be a part of conservation practices. He stressed the need for sustainable hunting and also using proactive mitigation to control conflict situations rather than lethal control. Laurie Marker, of the Cheetah Conservation Fund (CCF) in Namibia Africa, presented their work on cheetah conservation in Namibian farmlands. CCF has a three tier approach to conservation through research, conservation and education. The organization has initiated programs such as the use of ancient breeds of Livestock Guarding Dogs that live with and protect the livestock. Another program, Cheetah Country Beef looks at international consumers buying Namibian beef to support farmers through a price premium for good farmers practice that promote nonlethal predator practices while supporting sustainable agriculture, where farmers benefit economically while not killing predators. Additionally, and most importantly for the Indian situation, are the CCF training programs. CCF provides practical training programs for a variety of groups, from professionals in the wildlife field, to rural farmers in pre-arranged topics including land use planning and predator ecology, field research techniques, wildlife capture, immobilization and handling, captive wildlife husbandry, non-lethal predator control techniques, livestock and wildlife management.

The consensus among scientists and researchers involved in large carnivore conservation is that scientific research must be the foundation upon which sound management policies are formed.

Reasons for Conflict

With the current rate of expansion and growth of the human population, conflicts with carnivores are becoming more and more unavoidable. The conference members discussed various reasons for human and leopard conflicts, which include habitat disturbance, human behavior and lack of scientific data.

In India, there is an increased interface between humans and leopards. Leopards are highly adaptable and can vary their diet (Daniel 1996, Shukla 2002). In areas where the natural prey species have declined, it is not uncommon for leopards to prey on humans, dogs, cows, goats, and other domestic species. The economic losses of livestock and human depredation can increase human-carnivore conflicts (Woodroffe 2000, Treves & Karanth 2003).

In addition to its varied diet, the leopard can live in diverse habitats. Human landscapes are changing rapidly to meet the demands of the world's increasing population. In areas of India where the climate and soil are ideal, people have converted natural habitats into sugarcane fields or tea plantations. These agricultural areas provide shelter and cover for the leopard. It is in these areas with high encounter rates between people and leopards that attacks on people can occur.

Researchers and scientists have noted the lack of scientific research being conducted on the leopard. In order to form effective conservation targets, scientific data is vital so that conflicts are prevented from occurring altogether. There is a need to form policies for proactive versus reactive responses. More accurate human - leopard encounter figures are needed as well as constant monitoring of leopard populations and its prey. Athreya also noted that proper monitoring of relocated leopards is vital to understand better the impacts of this reactive management measure (Athreya 2006, Athreya & Belsare 2007).

Action Plan for the Future

During the time frame of the conference, various group discussions were held to brainstorm possible solutions that could be drafted into a national policy to deal with human-leopard conflicts in India. The results from these group discussions are as follows:



Workshop participants in New Dehli (Photo L. Marker).

Rapid management of crisis situations

In instances where a leopard causes conflict or becomes involved in a difficult situation (such as being trapped or falling into a well) in a human dominated landscape, it is necessary to manage the conflict with speed and accuracy in order to prevent panic and injuries or death. The conference participants suggested forming Emergency Response (ER) teams as an exsitu management option. These teams should be on standby to speedily manage human leopard crises in conflict-prone areas. ER team members should consist of a person at the rank of an Assistant Conservator of Forests (ACF), one veterinarian, and at least five trained support members. Functions of the ER should include declaring a curfew in the area in order to manage a crowd; informing the public at large about the situation through a public address system; alerting police as well as having ambulances ready. It is imperative that ER team members be trained adequately and thoroughly to work with the necessary equipment and transport protocol. Managers must ensure that personnel are trained to act in any possible situation involving one or many leopards. After capture, the ER team should ascertain the health condition of the leopard and assess whether it is fit to release. If the animal is deemed not releasable and depending on its condition, the leopard can either be kept in lifetime captivity or euthanized. If ER teams acted with suitable protocol and equipment in a speedy but efficient manner, serious human-leopard conflicts could be avoided and managed.

Government involvement

Conference participants stressed the need for infrastructure and capacity building within the Forestry Departments in respective states. Adequate training and equipment must be given to forest officials, police officers and other government personnel so that they can deal with human wildlife conflicts throughout the country. Another hindrance to effective conflict management is that wildlife managers could face legal problems while making site specific decisions, as per provisions in the Wildlife Protection Act. The conference members suggested making amendments to section 11 of the Wildlife Protection Act to make them more amenable to conflict resolution. The MoEF could also enact guidelines so that the actions taken in good faith by the Chief Wildlife Warden are made legal and field level officers are empowered to deal with capture of conflict animals. There is also



Leopard in India (Photo WCS India Program).

a need to ensure that laws are clearly translated into enforcement and terms such as "problem animal" must be defined to prevent confusion during interpretation of the law.

Increasing scientific knowledge

More research must be conducted on large carnivores and their interaction with the environment in order to fully understand the impacts these animals have on their surroundings. Suggestions from the conference attendees included allowing trapping for research purposes, increasing wild prey availability in reserves, building more water reservoirs, restoration of degraded areas and also obtaining accurate population estimates of leopards. Expanding the current knowledge on this highly elusive animal is crucial to saving the species. It is necessary to bridge the gap between scientific knowledge and wildlife management to form effective policies to not only control present cases of human animal conflict, but also prevent future conflicts from arising.

Community involvement

India's growing population can be a great obstacle for wildlife conservation but the people can also play a vital role in species conservation. Community based conservation initiatives are long-term solutions to managing human wildlife conflicts all over the world. In Namibia, local communities have formed conservancies that allow them to profit from the presence of wildlife. The principle is that once the people realize they are valuable stakeholders and are provided with incentives, they have the motivation and desire

to conserve wildlife and its habitat (Marker 2002). Conference members proposed the formation of a Community-Based Participatory Management Plan. A major part of the plan is education. During times when leopards stray into an area, people must be taught the proper way to respond to the situation (such as by staying and locking themselves into a secure area and notifying authorities). Local herders and shepherds would be encouraged to use alternative animal husbandry practices (such as fencing) that would discourage conflicts with wild animals. The locals would also be taught how to manage man made wastes properly and also manage stray domestic animals so that they are not identified as prey by carnivores. Another idea was self insured compensation, whereby the locals are able to receive money in a situation where their livestock has been injured or killed by leopards or other large carnivores.

Conclusion

The issues discussed at the conference span social, political and economic arenas. If conservation of large carnivores is to be successful, all these aspects must be addressed. In problem areas of India where human conflicts with leopards are on the rise, drastic action must be taken to ensure that conflicts are dealt with rapidly. Emergency Response teams must be formed with trained personnel and adequate equipment to deal rapidly with wild animals and panicked people. This option is a short-term management strategy. There is a real need to develop a principle understanding that species like leopards actually live in human dominated landscapes and that they

are not just animals that have “strayed” from some distant reserve. Accepting this principle should then open the way for a focus on long-term, proactive and sustainable management practices, rather than short-term reactive policies. Long-term strategies such as increasing scientific research on leopards and educating the public are equally important in the management of such an elusive species. Such a change requires policy development at a central level as it requires both legal and philosophical changes to the way India manages its wildlife populations.

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