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**TRAINING**  
**MAHARASHTRA FOREST DEPARTMENT**  
**PERSONNEL TO USE CHEMICAL RESTRAINT AND MICROCHIPS**  
**TO BETTER MANAGE MAN - LEOPARD CONFLICT.**



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*Funded by*  
**THE RUFFORD MAURICE LAING FOUNDATION,**  
**U.K.**

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Athreya<sup>1</sup>, V.R. & A.V. Belsare<sup>2</sup>. 2005. Training Maharashtra Forest Department personnel to use chemical restraint and micro-chips to better manage man-leopard conflict. Report submitted to The Rufford Maurice Laing Foundation, U.K.

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*The idea for this work came about when we went to rescue a leopardess trapped in an illegal snare in Otur, Junnar, Pune District, Maharashtra in February 2003. It was the hopelessness of the situation and the realization that very little was required to rectify it that led to the proposal for this project. We would like to dedicate this work to that leopardess.*

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## Acknowledgements

This work was possible due to a grant from The Rufford Maurice Laing Foundation, U.K. We would like to thank Josh Cole for the hassle-free nature of the grant disbursement, which allowed us to use it in the best way possible and the Wildlife Protection Society of India, New Delhi and Belinda Wright for their support to this project.

We would like to thank the Maharashtra Forest Department for their complete support towards the project. In particular we would like to thank the Retired Principal Chief Conservator of Forests (Mr Gogte) who provided us with initial help and then Mr Subramaniam (Principal Chief Conservator of Forests - WL) as well as Mr Majumdar (Additional Chief Conservator of Forests, BP&D) who showed great interest in how the training was carried out. We would also like to thank Mr Thosre (Chief Conservator of Forests, Pune) who provided us with very valuable suggestions, advice and guidance without which this project would not have been as successful. Other officers we would like to thank for their interest and support are Dr Ketrupal (CCF - Nashik T), Mr Yadhavendu (CCF - Thane WL), Mr Thorat (CF - Kolhapur T), Mr Saiprakash (CF - Kolhapur WL), Mr Limaye (DCF - Satara T), Mr Pathak (DCF - Junnar T), Mr Dharankar (DCF - Kolhapur T), Mr Maheep Gupta (DCF - Yaval WL), Mr Shelke (DCF - Ahmednagar T), Mr Adkar (ACF - Junnar T) and Mr Hinge (ACF - Sangamner T).

We would also like to thank Mr Kishore Mungale who fabricated the tranquilising equipment, so that it could fit our requirements as well as our slim budget. We would like to thank Ecollage, Pune, which provided five copies of the manual for each of the teams. We would also like to thank Sujoy Chaudhuri, Gowri Mallapur, Brijesh Raj, Shomita Mukherjee, Sanjay Thakur, Mr S. Raha, Mr Bhurelal, Vikram Hoshing, Nitin Desai, Rupali Belsare and Aparna Watve for their help. VRA would like to thank Ramana and Aarushi Athreya for 'being there'.

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## Summary

### *Training*

Human-leopard conflict levels have increased in the last decade in some Indian states. Severe conflict levels commenced in 2001 in the state of Maharashtra (Athreya et al., 2004) and in areas affected by conflict, it was not uncommon to encounter leopards within towns, in building, in snares, in wells etc. In such a situation, a desperate carnivore trying to escape in the presence of large crowds can be fatal to people, the personnel trying to manage the situation and the animal itself. In most cases, to prevent the situation from turning into a law and order problem the animal was shot by the police. This response, can be considered at best very primitive, given the technology and experience present world wide to tackle such situations.

We also believe that killing an animal which needs to be rescued is a wrong step especially when we are dealing with highly protected species like the leopard. Moreover, this response is the only possible one given that there has been no prior sensitisation or training of the relevant authorities to better tackle such situations. In order to take a step in this direction, we initiated this project whereby five forest department teams were trained in chemical restraint techniques so that they could rescue species like the leopard when they required human help.

The five teams (Jalgaon, Nashik, Junnar, Satara and Kolhapur) were from the territorial (not wildlife) divisions reporting man - leopard conflict and are along the length of W. Maharashtra. More than 200 people, from the local police department, fire brigade personnel, veterinarians and NGO's attended the training, and 25 people were provided with rigorous training in tranquilisation methods.

Each team consisted of five members from the forest department (range forest officer, forester and forest guard) who could be assisted by any local veterinarian. The equipment that was provided as part of the project to each of the five teams consisted of a blowpipe and associated syringes, a jabstick and a telescopic snare. A manual which contained the relevant information and authored by Dr Aniruddha Belsare was also provided to each team. During the training an effort was made to provide basic information on the biology of felids to the teams.

Following the training successful rescues were carried out by the teams with the help of the local veterinarians. Furthermore, the field staff of the Forest Department showed motivation and interest to be part of these

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teams and the senior officers too evinced interest in the entire training programme. Ideally this initiative by the Maharashtra Forest Department should provide the impetus for a nation-wide change so that wild carnivores are better dealt with they require human intervention.

### *Micro-chipping leopards*

Leopards are highly persecuted to feed the increasing demand of the illegal wildlife trade. Although they occur more commonly than the other large cats in India, leopards are killed in greater numbers for their skin and body parts. Pressures such as the above along with habitat loss are likely to adversely affect the future of this species in the near future. It is important that immediate efforts be taken to provide and implement more robust management policies to ensure low conflict levels.

Currently the most common management strategy used in India in the event of a 'leopard problem' is the setting up of trap cages and release of the trapped animal into natural habitats. In order to aid the managers in better understanding the efficacy of this method, passive transponders were inserted into the leopards that were going to be released back into the wild. The relevant information obtained was provided in the form of recommendations/updates to the Principal Chief Conservator of Forests – WL and other senior officers, for follow up action. An analysis of conflict levels in the last year indicates that for the first time in many years, the numbers of attacks on people in the two main high conflict areas in the state have been very low and this is likely to be due to better management actions used by the Forest Department.

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## 1 Introduction

The leopard (*Panthera pardus fusca*) has a ubiquitous presence in India (Daniel 1996). Historical records report its presence near human settlements (Seidensticker et al. 1990, Seidensticker & Lumpkin 1991, Johnsingh 1992) but it is only since a decade or so that man - leopard conflict levels have surged in parts of some Indian states (WWF-India 1997, Vijayan & Pati 2001, Athreya et al. 2004, Pati et al. 2004). In Maharashtra alone, at least 25 people were killed by leopards and many more injured only in 2004 (Maharashtra Forest Department records). The leopard is a Schedule I species and is provided the highest protection under the Indian law (Anon 1972). The main threat to the leopard, is the high demand for its body parts in the illegal wildlife trade (records from the Wildlife Protection Society of India, New Delhi) and the number of leopards that are killed for their body parts far outnumber those of tigers (WPSI web page).

Thus here, we have a species which is capable of living close to humans and increasing the potential for conflict, as well as severely threatened due to poaching for its body parts. Because of the increasing conflict levels there was a public view that the protection accorded to this seemingly abundant species should be reduced. It is important that the reasons behind the increasing conflict levels be taken into consideration so that negative publicity arising due to increasing conflict levels does not further condemn its survival.

In areas reporting high conflict levels, incidences of leopards 'straying' into human settlements, falling into open wells or trapped in snares are common and these require human intervention. For lack of any training or equipment, the most common recourse to date, has been their death due to police firing. Normally in the ensuing melee, some people are injured. This kind of reaction towards a carnivore that requires human help has resulted in negative media publicity and often the Forest Department, which as the managing authority is perceived to be incapable of action.

We targeted the field staff of the forest department as well as the local veterinarians along the western length of Maharashtra to set up five teams that can attend to emergency calls regarding wild carnivores, particularly the leopard. We also assisted the Forest Department to micro-chip leopards that were slated for translocation so that they could better manage the animals especially in cases of individual leopards that did attack people following their release into the wild.

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**Figure 1.1 Leopardess successfully rescued by a trained team from a snare set in a field near Sangamner town.**



Through this training programme we

1. achieved a professional and humane way by which the trained Forest Department personnel handle species like the leopard when they are in an wildlife emergency situation and
2. provided important management recommendations to the Forest Department by microchipping leopards slated for translocation, thereby allowing the manager to take relevant decisions to lower conflict levels in the state of Maharashtra.

## 2 Details of the project

### 2.1. Training

#### 2.1.1 Introductory broad-based modules

The locations of the teams were decided on consultation with the Principal Chief Conservator of Forests, Maharashtra. All these five regions fall under the jurisdiction of the territorial division of the Forest Department and have reported man – leopard conflict in the recent past.

**Figure 2.1 Demonstrating and explaining use of immobilization equipment at Satara**



The first training module was targeted at the personnel from the Forest Department, Police Department, Fire Brigade, local veterinarians and local NGO's (non-government organizations).

**Figure 2.2 Hands-on practice session for participants at Junnar.**



The number of people and the dates of the workshop are presented in the following table. The first broad based training module dealt with an introduction to the reason for conducting the workshop, introduction to the principles of remote drug delivery system, housing and care of the animals once captured, hands on training with the use of the blowpipe and finally a question-answer session (please see Belsare, 2005) for details).

**Table 2.1 Number of people involved in the training**

Place	Date	Minimum number of people that attended.
<i>Broad-based sessions</i>		
Junnar	26 Aug 03	26
Sangamner	18 Sep 03	59
Satara	10 Oct 03	53
Kolhapur	27 Nov 03	45
Yaval	6 Feb 04	45
<i>Training the teams</i>		
SGNP	13-14 <sup>th</sup> Jul 04	55
<i>Follow-up session for WCRT teams members</i>		
Kolhapur & Satara	21 Feb 05	15
Junnar & Nashik & Jalgaon	25 <sup>th</sup> Apr 05	60

### 2.1.2 *The five 'Wild Carnivore Rescue teams'*

The final members of the teams were chosen based on the recommendation of their senior officers (Chief Conservator of Forests/Conservator of Forests/Deputy Conservator of Forests) and were trained over two days at the Sanjay Gandhi National Park (SGNP), Mumbai.

Each team was granted permission by the Chief Wildlife Warden of the State to tranquilise a leopard. These were trapped in SGNP following a surge in conflict in and around the Sanjay Gandhi National Park, Mumbai in June 2004. We used this opportunity where five veterinarians were present to supervise the procedure carried out by the Wild Carnivore Rescue team members. Immobilisation procedures (use of equipment, drug dosage was explained to the other veterinarians, code of conduct of each member of the teams, etc.) was explained in detail to the teams following which each team along with an assisting veterinarian successfully tranquilised a leopard.

**Figure 2.3** The Nashik team along with the Chief Conservator of Forests (Pune) following the training in SGNP, Mumbai.



The five team members were assigned separate roles (using and taking care of the blow-pipe during the operation, taking care of the equipment and assisting the person with the blowpipe, not allowing external disturbance to the other four members of the team, assisting the veterinarian in writing notes on the health status of the animal, making sure the requirements of the team were met with).

**Figure 2.4** Veterinarian explaining the use of blow-pipe to the teams. *Inset:* Veterinarian assisting one of the teams during a tranquilisation procedure at SGNP.



The person who was assigned use of the blowpipe practiced its use, the veterinarian practiced the filling of the syringe and each member tested the use of the snare, prior to the actual tranquilisation. Once the leopards were tranquilised, important information like weight, heart rate, respiration rate and temperature were measured at close intervals. The importance of taking these measurements diligently was highlighted to the teams.

A follow-up training session for all the five teams was carried out in February 2005 (for the Kolhapur and Satara teams) and April 2005 (for the Jalgaon, Nashik and Junnar teams). In this session, information on the use and care of equipment was repeated, practice sessions were held and a report on the condition of the equipment was provided to the respective senior officers.

**Figure 2.5** A team member weighing a tranquilised leopard.



A manual written by Belsare (2005; *see below*), was provided as part of the equipment to all the five teams during the last training session.

### **2.1.3** *Equipment*

The equipment provided were 1) blowpipe with syringes 2) a jabstick - which is a metre long syringe and effective for tranquilising animals which are trapped 3) a telescopic snare with a noose that can be released

instantaneously. The equipment was manufactured indigenously<sup>1</sup> keeping in mind the conditions and the remote areas where these teams are likely to function. An important requirement was a greater volume capacity of the syringes. This is because the anaesthetic drugs which are animal specific are available only in select large cities whereas most of the emergencies occur in remote areas. In such cases it is possible for the teams to use the same drugs that are available locally in any rural human and animal chemist. However, their concentrations are lower than the specialty drugs and therefore they need to be used in higher volumes. Rigorous testing of the equipment has been carried out and is routinely used by the co-author (AB).

**Figure 2.6 The indigenously manufactured tranquilising equipment provided to the five teams.**



*An easy-to-use manual.*

As part of the training we had planned on providing reference material to each of the teams. The information it contained would be targeted at the local veterinarians who could use the manual to obtain information on the drugs and their dosages, as well as for senior forest officers who could use the manual as a guide for further training of the field staff. The reference material finally evolved into a manual written by co-author in a simple language and style. It contains information on the drug and equipment usage as well as the post-capture management of the trapped leopards.

<sup>1</sup> Manufactured by Quality Engg. Pvt. Ltd. Pune. <khm@vsnl.com>

### 2.1.4 Successful emergency management by WCRT:

#### Case 1.

17<sup>th</sup> August 2004. The Nashik team was called to rescue a leopard from an abandoned dilapidated hut in the Gangapur area, Nashik.

The animal was successfully tranquilised by the Wild Carnivore Rescue Team with the help of the local veterinarian Dr Gaikwad. It had a severe mange-like skin condition and was moved to the rescue centre in Sanjay Gandhi National Park, Mumbai.

#### Case 2.

26<sup>th</sup> January 2005. A leopardess was trapped in an illegally set snare at the edge of a sugarcane field in Sangamner, Ahmednagar Forest Division. The Nashik Wild Carnivore Rescue Team helped by the local livestock developmental officer Dr Thakur successfully rescued her. She is currently in the rescue centre in Junnar.



There will always be instances of wild carnivores requiring human intervention. In such cases it is impossible to help them without restraining devices, be it chemical (tranquillisation) or physical (e.g., squeeze cages). Normally, the Forest Department summons a veterinarian who prescribes the treatment but because of the lack of restraining facilities in most places, no treatment is given. We recommend that chemical restraint be made the norm for dealing with wild caught carnivores and we strongly discourage the use of the physical restraint (squeeze cages).

**Figure 2.7 A wild caught leopard in a squeeze cage.**



This is because chemically restraining the animal is less stressful to it. In a squeeze cage a fully conscious wild leopard is brought into very close contact with people and this should be avoided at all costs especially if the animal is going to be released back into the wild.

The cost of a chemical restraining set is not high and is not difficult to use if a basic level of training is provided. Livestock veterinarians are present even in remote areas in India and as we have seen, Forest Department field staff is capable of using the equipment if given the training. Moreover, if used increasingly it will also benefit the Forest Department in cases of carnivore related emergencies.

## **2.2 *Microchipping and its use in decision making by managers***

As part of an earlier, (Athreya et al. 2004, Belsare et al. 2004) and current project, we have been micro-chipping leopards in the Forest Divisions of Junnar, Nashik and Ahmednagar. This procedure is used to assist the Forest Department to better understand the efficacy of translocation of leopards trapped because they were a problem in one way or the other. Trovan ID 100 bio-injectable chips were inserted in the leopards<sup>2</sup>. The site of injection is as followed by Athreya et al. (2004). Trovan chips are recommended by the IUCN/SSC Captive Breeding Specialist Group (IUCN-CBSG, 1991) for use in captive tigers.

<sup>2</sup> These were purchased from Helpro Health Products & Services <Helpro@sancharnet.in>

Figure 2.8 The microchip; reading the microchip.



The results of the chipping exercise are provided periodically to the office of the Principal Chief Conservator of Forests (Wildlife) along with information that might have a serious bearing on management decisions. This has allowed the managers to take appropriate action based on scientific information. Twenty one leopards were chipped between August 2004 and March 2005. All these individuals were trapped in conflict situations.

#### Case Studies

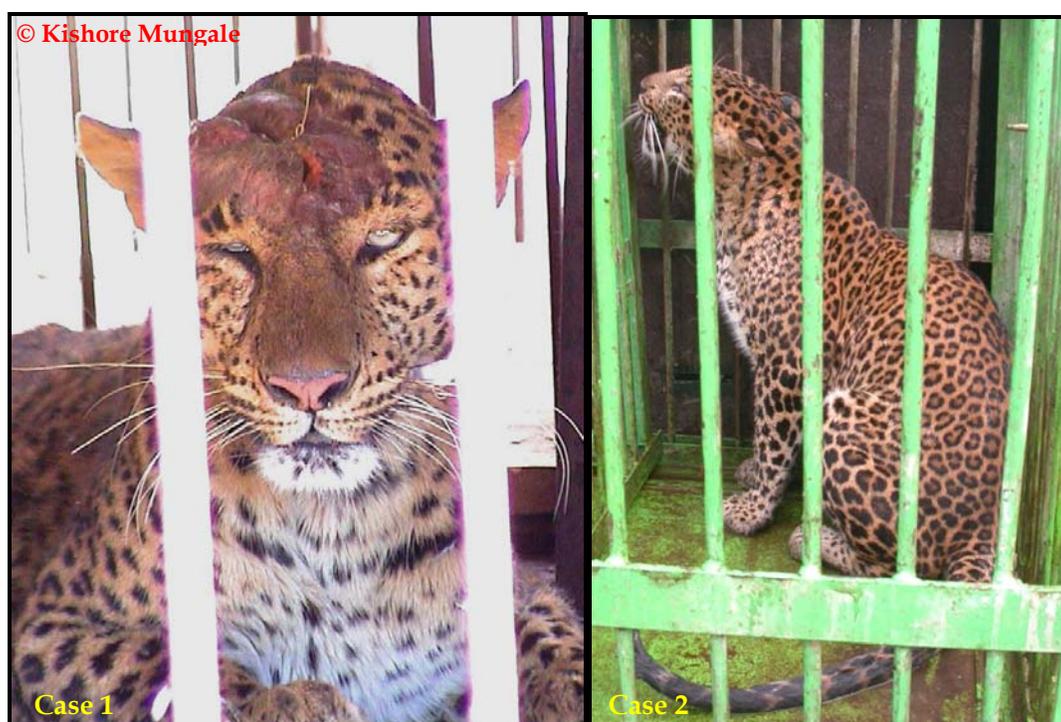
Microchips provide powerful information on the fate of the translocated leopard as well as the patterns of conflict, but only in the case of recapture of leopards at the site of release. We were able to document only four such instances. This is because not all leopard problems result in the trapping of a leopard. Moreover, high mortality rates of 60 - 70% are associated with translocated carnivores (Linnell et al. 1997) and in the absence of active post-monitoring following release we cannot estimate mortality due to translocations.

The four instances of recaptures that we were able to document, along with past information on felid biology from literature has allowed us to provide management recommendations to the Principal Chief Conservator of Forests (Wildlife) of Maharashtra to better manage man - leopard conflict. We also have reason to believe that the acceptance of these recommendations by the managers has actually resulted in very low levels of conflict in this state for the first time in many years. This provides an example of how scientific knowledge can aid managers in a positive fashion to better manage wildlife issues in our country.

Two such cases are detailed below.

***Case 1. Chip number 00-063B-5957***

The adult female was trapped in the Junnar Forest Division on 16 March 2003 and released in Radhanagari Wildlife Sanctuary on 1<sup>st</sup> February 2004. The very next day she attacked a boy. His father hit her on the head with a sickle grievously wounding her. She took shelter in a culvert and was later trapped by the local Forest Department authorities. Her origin could be determined from the chip she carried. She was then sent to the rescue centre in Sanjay Gandhi National Park, Mumbai, where she is present till date. This was the first ever attack by a leopard on a person in Radhanagari WLS.



***Case 2. Leopard's 00-063B-5A64 & 00-063B-3F95***

The male was trapped in March 2003 and the female in February 2003 from the Junnar Forest Division. They were released in the Yaval Wildlife Sanctuary (a distance of about 300 km from Junnar) in October 2003. Following their release, four human fatalities and two injuries due to leopards were reported in Yaval. These attacks on people were the first in the history of this Protected Area. In the following year, four more people were reported killed and four injured in an area ranging from Yaval to 90 km southwards towards Junnar, in highly human populated areas where leopard problem/sightings were not previously reported. Following many unsuccessful attempts at trapping, the local forest department lured the

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animal into a well and she was found to be the female 00-063B-3F95 who had traveled about 90 km towards the direction of Junnar. At the time she was trapped she was in excellent physical condition as can be seen from the picture. She is now in the Manickdoh rescue centre at Junnar. Again the se animals were responsible for the first ever recorded attacks on people in Yaval Wildlife Sanctuary and Chalisgaon Territorial Forest Division.

In India, no post-release monitoring of any species rehabilitated into the wild is done. As per the IUCN guidelines on release, it is mandatory and is important that it be followed in India because information obtained from post-release monitoring will tremendously benefit managers to devise more robust management practices.

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### 3 Results of the training

#### *The training*

The training resulted in greater sensitivity on the methods available to handle wildlife emergencies related to endangered carnivores across a wide spectrum of people. Furthermore it was also demonstrated that it was possible for this procedure to be carried out by the field staff of the Forest Department with the help of local veterinarians. It was also helpful in educating the local level police Department personnel on the problems the field staff of the Forest Department faced in the event of an emergency. Moreover, it also helped in obtaining the support of the local veterinarians who have not had any experience in dealing with wild animals and who now have an interest as well as the background to help the Forest Department when required.

**Figure 3.1 Checking the equipment during the last session.**



More importantly, we feel that the senior forest officials of the state of Maharashtra have appreciated the positive direction this training has imparted in dealing with wild carnivores that require human help. The final session of our programme was held in Pune in the presence of the Principal Chief Conservator of Forests (Wildlife) of Maharashtra and other senior officers.

There is now an awareness among the field staff on the drugs required for tranquilisation as well as contra-indicative drugs for felids (Non Steriod Anti Inflammatory Drugs are routinely used for leopards during treatment

and this was highlighted to the teams) and this important information was found to be lacking even among many of the local veterinarians.

Among the field staff, most of the team members were motivated to be part of these teams. In some cases, the personnel regarded their inclusion into the teams as a matter of pride as is seen in the picture below where a member had laminated the certificate and picture we had provided and has worn it as a badge.



Other Forest Divisions have approached us for training them and they will be procuring the equipment on their own. If such initiative is seen across India, it will indeed bring about a change in the way wild carnivore like the leopards are handled in an emergency situation.

### *The micro-chipping*

Micro-chipping the leopards trapped in human dominated areas and translocated to other forested areas has provided a very powerful data to the Forest Department on the efficacy of this method to deal with man - leopard conflict. It does appear that the decrease in translocation has lead to decreases in conflict levels across W. Maharashtra.

#### 4 Flowchart detailing the training programme.

Advice from PCCF - WildLife to determine location of teams



Letters to CCF's requesting assistance in organizing and inviting

1. regional level forest department field staff
2. police department staff
3. fire brigade staff
4. local government/private veterinarians
5. interested NGO's/naturalists



Broad-based, day long sensitization workshop - conducted by

1. veterinarian with wildlife experience
2. wildlife biologist



- Focused two day effort aimed at the five core teams consisting of five field staff of forest department along with local veterinarian.
- Handing over of equipment, jackets, manual
- Permission obtained from CWLW for each of the core teams to immobilize a caged leopard\*
- Leopards to be immobilized only by the core teams under the supervision of veterinarians who have also been trained in the past. We observe from the sidelines and provide comments at the end of the session
- Handing over of certificates, photographs



Filming a rescue operation carried out by the teams



- Final half day session with each of the teams to
- Refresh usage and care of the equipment
  - To check their equipment
  - To provide comments/appreciation/criticism of any past rescue operation.

\* we, as well as the managers thought it very important that the teams have handled at least one emergency situation with the 'cat in the hand'. Handling an emergency situation without prior rigorous knowledge of the procedure or the carnivore's behaviour could be dangerous given the large mobs that form during emergencies.

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## 5 Alterations to the original project

### *1. Providing equipment to the staff*

This was not originally envisaged since we expected the Forest Department to procure it. However, we learnt that it would not be an easy process and in the absence of the sets any training that we would give would be of no use. Therefore, following a formal request from the Forest Department we decided to get it manufactured locally.

### *2. Conducting the microchipping exercise*

As part of the project, we had hoped to provide microchips to the five teams so that they could use them when a carnivore was trapped. We had envisaged that they would then access a web page designed by us so that the data could be accessed centrally and thereby aid in management actions. However, our experience indicated that capability to use microchips and interpret the results, requires a far greater degree of training than is currently available among the field staff. Given the time and resources we had, we chose to focus on training them to handle emergency situations. We, on our part, will continue to carry out the microchipping and provide regular updates and recommendations to the concerned senior officers.

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## 6 Conclusions

So far in India, there are no policy guidelines to assist managers to better deal with emergencies related to carnivores. This is despite the presence of many capable and trained people and it is time this is changed. The feedback we obtained from the field staff and senior officers of the Maharashtra Forest Department, the local veterinarians, NGO's, Police and Fire Brigade personnel indicated that they found the training very beneficial. Prior to our work, a leopard that had entered a road side hotel in Nashik was shot and killed by the police. Following our first session in Sangamner, which provided a sensitization on the issue, the Forest Department along with the local Police Department personnel and a NGO member successfully cordoned off the area and initiated mob control activities till we reached there (a journey of about 3 hours). The leopard who had taken shelter in a house in a crowded locality but was rescued amidst a mob of greater than 5000 people. This was only because the authorities were aware of better ways of dealing with such a situation than resorting to killing the animal.

Furthermore, following our detailed training session in July 2004, the WCRT of Nashik successfully rescued two leopards. Since such incidences will always be present, we recommend that such training be taken up by the Government agencies across the country. These are the recommended methods of dealing with wild caught carnivores and are more humane than the methods currently in use.

Micro-chipping leopards prior to translocation has been used in Gir National Park, Gujarat and has been also used in W. Maharashtra since 2003. Micro-chipping was also carried out as part of this project and it has helped tremendously in aiding the managers to better manage leopards trapped from high conflict potential areas. For the first time in many years, conflict levels have declined in the state.

The two drawbacks we faced when conducting the training programme were the current lack of an institutional set-up to sustain these teams and the absence of a system where people in charge of the teams are held responsible for the equipments and the work carried out during emergencies. This has to be built in through the Forest Department channels. How this can be achieved needs to be worked out prior to any future training of this kind.

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## 7 Recommendations

1. **A country-wide policy on dealing with man - large cat conflict and related issues such as handling wildlife emergencies is long overdue.** Without any guidelines it is not possible for the individual manager to effectively manage a carnivore either while capturing it, during captivity or during release.
  
  2. The success of this training programme rests solely on the levels of interest of each of the team members. Since these personnel are likely to get transferred and new people will occupy the post, it is essential that the Forest Department now puts into place procedures by which the Wild Carnivore Rescue teams will sustain themselves. **Moreover, a system has to be set in place whereby such rescue teams are an integral part of the Forest Department.**
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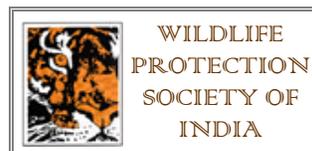
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*This report is a result of a training programme conducted to provide the field staff of the western region of the Maharashtra Forest Department simple but state of art methods to deal with species like the leopard (highly protected by Indian law) when they require human intervention. This has been the first such attempt in our country where otherwise, leopards found in human-dominated areas and/or caught in snares are killed by the police or the public for lack of better methods to rescue them.*

*Micro-chipping of leopards slated for translocation was also carried out to provide the managers with information that would aid in better management of this species, otherwise implicated in severe conflict levels.*

*An important aim of this project was to project the capability of the field staff of the Forest Department to use simple but humane methods to deal with species like the leopards in emergency situations.*



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