

**STANDARD OPERATING PROCEDURE
TO DEAL WITH EMERGENCY ARISING
DUE TO STRAYING OF TIGERS IN
HUMAN DOMINATED LANDSCAPES**



NATIONAL TIGER CONSERVATION AUTHORITY

**MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE
GOVERNMENT OF INDIA**

No. 15-37/2012-NTCA
Government of India
Ministry of Environment and Forests

National Tiger Conservation Authority

Annexe No. 5, Bikaner House,
Shahjahan Road, New Delhi-110011.

Telefax: 2338 9883

E-mail: jdntca@gmail.com

Dated the 30th January, 2013

To,

1. The PCCF/HOFF(s), Tiger Range States.
2. The Chief Wildlife Warden(s) Tiger Range States.

Sir,

As you are aware, advisories have been issued by the Project Tiger/National Tiger Conservation Authority, time and again, for dealing with emergency arising due to straying of tigers in human dominated landscapes. Based on inputs from field officers, experts vis-à-vis the said advisories, a Standard Operating Procedure has been developed after fine tuning to meet the present challenges.

In this context, I am directed to forward herewith a copy of the said Standard Operating Procedure (SOP) for dealing with emergency arising due to straying of tigers in human dominated landscapes, duly approved by the competent authority, for implementation.

The SOP may please be translated in vernacular and widely circulated amongst the field staff for guidance.

Yours faithfully,

Encl: As above

(S.P. Yadav)

Deputy Inspector General (NTCA)

Copy for information to:

1. PS to MEF.
2. PPS to Secretary (E&F).
3. PPS to DGF & SS, MoEF.
4. PPS to ADG (WL).

Copy for information to:

1. Additional Director, WCCB, New Delhi.
2. IGF, Guwahati.
3. AIGs, Nagpur and Bangalore.



STANDARD OPERATING PROCEDURE TO DEAL WITH EMERGENCY ARISING DUE TO STRAYING OF TIGERS IN HUMAN DOMINATED LANDSCAPES

1. **Title:** Standard Operating Procedure to deal with emergency arising due to straying of tigers in human dominated landscapes
2. **Subject:** Dealing with emergency arising due to straying of tigers in human dominated landscapes
3. **Reference:** Advisories of National Tiger Conservation Authority/Project Tiger on the subject
4. **Purpose:** To ensure that straying tigers are handled in the most appropriate manner to avoid casualty/injury to human beings, tiger, cattle and property.
5. **Short Summary:** This Standard Operating Procedure (SOP) provides the basic, minimum steps which are required to be taken at the field level (tiger reserve or elsewhere) for dealing with incidents of tiger straying in human dominated landscapes.
6. **Scope:** The SOP applies to all forest field formations including tiger reserves besides other areas where such incidents occur.
7. **Responsibilities:** The Field Director would be responsible in the case of a tiger reserve/fringe areas. For a protected area (National Park/Wildlife Sanctuary), the concerned protected area manager would be responsible. In the case of other areas (revenue land/conservation reserve/community reserve/village/township) the Wildlife Warden, as per the Wildlife (Protection) Act, 1972, or Divisional Forest Officer/Deputy Conservator of Forests (under whose jurisdiction the area falls), would be responsible. The overall responsibility at the

State level would rest with the Chief Wildlife Warden of the concerned State.

8. Suggested field actions to deal with strayed wild carnivores (tiger/leopard)
 - (a) At the outset, constitute a Committee immediately for technical guidance and monitoring on day to day basis, as under:-
 - i. A nominee of the Chief Wildlife Warden
 - ii. A nominee of the National Tiger Conservation Authority
 - iii. A veterinarian
 - iv. Local NGO representative
 - v. A representative of the local Panchayat
 - vi. Field Director/Protected Area Manager/DFO I/C - Chairman
 - (b) Since it may not be always possible for experts from the Wildlife Institute of India to provide assistance, it is advised that some outside experts may be involved in the ongoing monitoring.
 - (c) Establish identity of the tiger by comparing camera trap photographs with National Repository of Camera Trap Photographs of Tigers (NRCTPT)/ Reserve level photo database and find out the source area of the animal.
 - (d) Collect recent cattle/livestock depredation or human injury/fatal encounter data, if any, in the area. If it is an area historically prone to such incidences, detailed research work has to be carried out in order to assess the reasons for the frequent tiger emergencies in the area.



- (e) In case of confirmed livestock depredation/human injury/fatal encounters or frequent straying of tiger near human settlements, set traps (automatic closure) with appropriate luring while avoiding disturbance, to trap the animal.
- (f) Set up camera traps near kill site to confirm/establish the ID of the animal.
- (g) Ensure unobtrusive guarding of the kill to allow feeding of the carcass (if not close to a human settlement) besides safeguarding from poisoning (for revenge killing).
- (h) Create 'pressure impression pads (PIPs)' in the area to ascertain the daily movement of the animal, while plotting the same on a map (4" = 1 mile scale or 1 : 50,000 scale).
- (i) Proactively involve District Collector/DM and SSP/SP of the area to maintain law and order in the area, besides avoiding crowding by local mobs. Acquaint them with human-tiger conflict issues and guidelines of the NTCA to deal with the situation.
- (j) In all instances of wild carnivores like tiger/leopard straying into a human dominated landscape, the district authorities need to ensure law and order by imposing section 144 of the Cr.PC. This is essential to avoid agitation/excited local people surrounding the animal spot which hampers capture operation, leading to serious injuries on people and staff. It is also necessary that police and local administration be involved at an early stage. Effective coordination with them is critical to control mobs which as has been seen in several instances, worsen the situation and lead to avoidable fatalities/tragedies.

- (k) Take help of the district level officials to alert the villages in the vicinity of the area having the spatial presence of the tiger.
- (l) If successive trapping efforts fail, chemical immobilization of the wild carnivore should be done by an expert team having a veterinarian, as per the protocol at **Annexure-I**.
- (m) In case, the tranquilised tiger is found to be healthy in prime or young age without any incapacitation (loss of canine, injury, broken paw etc.), as confirmed/certified by the Committee as constituted at para (1), then it may be released after radio collaring in a suitable habitat with adequate prey base, away from the territory of a resident male tiger (if any) or human settlements, under intimation to the National Tiger Conservation Authority. (Under no circumstances an injured/incapacitated tiger should be released back, and the same needs to be sent to a recognized zoo).
- (n) Under no circumstances, a tiger should be eliminated by invoking the Wildlife (Protection) Act, 1972, if it is not habituated for causing human death. The guidelines for dealing with animals which have become 'Dangerous to Human Life' are annexed for compliance/guidance in this regard (**Annexure-II**).
- (o) In case of a healthy tiger/encumbered tigress occupying a sugar cane field or similar habitat, attempt should be made first to attract it to nearby forest area, while avoiding disturbance. If such operations fail, the animal should be captured through immobilization for release in low density



area of a nearby tiger reserve/protected area after radio collaring.

- (p) An authorized spokesperson of the Forest Department, should periodically update the media (if required) to prevent dissemination of distorted information relating to the operation/incidents. Sensalization or distorted information can lead to further damage.
 - (q) In case monitoring using camera traps (Phase-IV) is ongoing in the area, the minimum tiger numbers based on individual tiger captures, should not be given undue publicity without due cross checking with the National Tiger Conservation Authority.
 - (r) The Chief Wildlife Warden has to take the final decision on whether a tiger has to be released back in the wild or transferred to a zoo.
 - (s) It is important to have properly designed suitable cages and transport mechanism which cause least stress to the captured carnivore.
9. **Preventive/Proactive Measures** to be followed in tiger straying incidents/areas prone are at **Annexure-III**.
10. Guidelines for prioritizing areas for tiger monitoring are at **Annexure-IV**.

ANNEXURE-A

PROTOCOL ON IMMOBILIZATION AND RESTRAINT OF TIGERS

General Consideration

Behavior: Tigers in conflict or those strayed into human habitation differ considerably in behavior as compared to those in native/natural habitats. The animals may be stressed, shy, elusive, secretive and even unpredictable thereby posing challenge in capture. These animals may even pose safety threats for human involved in capture as well as to general public. *Utmost care needs to be taken to ensure safety of humans when attempts for capture are made.*

Capture Options: Tigers can be captured employing physical and chemical restraint methods or combination of both. The physiological and emotional status of the animal; length of the procedure; the environmental conditions; terrain/escape cover; equipment availability; drug appropriateness and availability and most importantly the safety of the operator/team needs to be considered prior to making a choice of procedure. Both the procedures have their benefits and limitations however the present guidelines would focus primarily on the chemical restraint procedures.

Chemical Restraint

Chemical immobilization has become an important tool in wildlife management over the last few decades. Advancement and development in this field has resulted in use of newer and safer drugs for immobilization, and efficient and reliable



systems of drug delivery. Chemical Immobilization involves use of drugs to restrict animal's movement by inducing a state of insensibility and preventing deliberate and coherent mobility. The technique is well suited for tigers in conflict as it allows capture of select individual, enables selection of time of capture and causes minimal stress to the animal. Chemical restraint drugs alter certain CNS functions without compromising the vital functions and produce a state of anaesthesia which immobilizes the animal to the extent that provides considerable safety both for human and animal.

Immobilization Equipment

Due to difficulty of directly approaching and handling wild animals, it is necessary to have safe and effective methods by which drugs can be administered. Projected darts have proved to be effective and safe option for delivering drugs to wild animals. The dart is projected through an equipment and discharges the medicaments intramuscularly upon impact. The darts are available in different sizes, however are specific to the type of equipment used to propel them. Different power projection systems have been used for projecting the darts however for tigers; the system that employs compressed gas/CO₂ to propel the dart should be selected. Light weight plastic darts of 3-5 ml. capacity should be used for remote injection using air powered/CO₂ tele-injection projector. Needle length is critical factor while darting tigers. The outside diameter of the needle should be 1.5-2.0 mm and length of 38-40 mm.

Immobilization Drugs

Though there are varieties of drugs that have been used for capturing tigers, a combination of alpha-2 adrenergic

agonists (sedatives) and dissociatives have proved to be effective for immobilizing tigers.

Alpha-2 adrenergic agonists/Sedatives: These drugs are CNS depressants with good sedative, muscle relaxant, and analgesic properties. These drugs need to be used with caution in animals as they produce initial hypertension followed by severe hypotension, bradycardia, hyperglycemia and glucosuria, disrupts thermoregulation and may lead to regurgitation/vomiting in carnivores. These drugs however have the advantage of being non-controlled, inexpensive and reversible. The drugs have been extensively used in felids in combination with dissociatives. A mixture of Xylazine and Ketamine in a proportion of 1.25 : 1 known as Hellabrunn mixture has been effectively used in tigers and other carnivores.

Another new Alpha-2 agonists Medetomidine in combination with ketamine has proved to be effective and specific sedative in large carnivores as it induces rapid drug induction and has specific antidote for reversal.

These Alpha-2 adrenergic agonists can be negated by antidote.

Examples: Xylazine, Detomidine, Medetomidine.

Antidotes include Yohimbine hydrochloride, Atipamezole hydrochloride, Tolazoline hydrochloride.

Dissociatives

These include the psychotomimetic drugs that are cyclohexamine derivatives. The drugs act by separating the conscious mind from sensory and motor or control mechanism in the brain (dissociative) producing, rapid analgesia and a trance-like state (psychosis) which may be as a result of over stimulation of the CNS. The animal appears unaware of human presence. They have the advantage of being rapidly absorbed following IM, IV administration, have good safety margin and cause little depression of the respiratory and circulatory system. Pronounced muscle rigidity, hyperthermia, hyper salivation, convulsion and rough recovery are common side effects. These effects can be considerably reduced by combining these drugs with a tranquilizer or sedatives. Their effect cannot be reversed and the animal has to be monitored for long till complete recovery takes place. These drugs lack specific antidote.

Examples: Phencyclidine, Ketamine hydrochloride, Tiletamine Hydrochloride



The choice of drug for immobilization may include the Hellabrunn mixture (HBM) (Xylazine–Ketamine mixture in ratio of 1.25 : 1) in appropriate doses. The dosage can be decided on the spot, taking into consideration the animal's health and condition, level of excitement, physiological status, sex, time of the day, and ambient temperature besides other habitat parameters. Medetomidine in combination with ketamine has proved to be effective for capturing tigers in conflict as it provides short and rapid induction thereby ensuring minimal movement of animal following darting.

Recommended Drug*/Dosages** for Immobilization of Adult Tiger

S. No.	Drug(s) for immobilization	Male	Female	Reversal drugs (antidote)
1.	Hellabrunn mixture (HBM) [Xylazine (XYL) and Ketamine (KET)] mixture in a ratio of 1.25:1	3.0 ml (375 mg XYL & 300mg KET) to 3.5 ml (437.5 mg XYL & 350 mg KET)	2.5 ml (312.5 mg XYL & 250 mg KET) to 3.0 ml (375 mg XYL & 300 mg KET)	Yohimbine hydrochloride (0.125 mgkg-1 body weight)
2.	Medetomidine (MED) and Ketamine (KET)	50-60 Dg kg-1 body weight MED and 1-2 mgkg-1 body weight KET		25-35 mg of Atipamezole hydrochloride

*/**: The list of drugs of choice provided is not exhaustive and concentrations mentioned are indicative only. The dosage to be administered should be left to the assessment of the veterinarian present.

Approach to the Target Animal

A four wheel field vehicle or trained captive elephants may be used to approach the animal taking due care of human safety and an overriding degree of patience. In a terrain where the vehicle cannot be used, possibility of darting the animal from a machan (raised platforms) may also be considered. Tigers in conflict provide limited opportunities for darting and therefore require adequate experience by personnel in effective darting as well as knowledge of anatomical peculiarities. Hindquarters should be preferred for tele-injection however depending on the opportunities; other suitable areas can also be explored.



Preferred darting site in a large carnivore

Induction Phase

The time interval between injection (darting) and the point when the animal is rendered immobile is induction period.



The total time for the completion of induction may vary from 10-15 minutes. A close observation should be kept by the team for any movement of the animal however the team should ensure minimal disturbance during induction.

Handling and Care of the Immobilized Animal

The animal should be approached quietly and following steps should be followed:

- Removal of dart
- Blindfolding to protect the cornea from direct sunlight, dust and injury.
- Ensuring proper animal positioning (sternal or lateral recumbancy) to maintain patent airways and ensure normal breathing and circulation.
- Assessing the status of animal, the degree of muscle relaxation and the rate and depth of respiration. Assessment of anesthesia should be done using following methods:
 - Monitor tissue perfusion: Anesthetic drugs frequently depress the contractile force of the heart and vasodilatation results in decreased tissue perfusion. Evaluation of tissue perfusion should be done by observation, auscultation, palpation and capillary refill time.
 - Monitor gas exchange: Respiratory rates are highly variable during anesthesia.
 - Quality of respiration should be evaluated by observing animal's chest movement.
 - Monitor level of CNS depression by assessing the muscle tone-jaw tone and eye reflexes.

- Monitor vital signs such as respiration, heart rate and body temperature.
- Examine animal for any wound or injuries (including status of canines and claws).
- Estimate animal body weight and if possible take bodily measurements.

Shifting of the Animal to Stretcher

The animal should be shifted to a stretcher and placed in lateral or sternal recumbancy. Animal should then be shifted to a transport container.

Reversal of Anesthesia

Specific Alfa-2 antagonists (Yohimbine HCl, Atipamezole HCl) should be used to reverse the anesthesia.

Supplemental Information

- (a) **Preparedness:** All equipment for crating the animal, radio collars and accessories, emergency medicaments, biological sampling accessories, transport containers and any other essentials should be in place before the animal is darted.
- (b) **Data Recording:** A complete immobilization record, particularly including each drug given, amount given, time of administration and physiological parameters should be maintained during the procedure. These details should be recorded in the data sheet in the format provided. It would be appropriate to ensure human safety considerations to meet any eventuality at all the time.



- (c) **Assessing depth of anaesthesia:** Usually a time lapse of 10-15 minutes should be given prior to taking any further action on the darted animal as the induction time varies with physiological status of the animal, which should be left to the judgement of the veterinarian present in the team. Prior to approaching the animal, the depth of anaesthesia should be assessed by either tapping on the tail or ears with the help of long pole and if the animal does not react, it should be approached. The depth of anaesthesia should be optimum if the jaws can be opened and the tongue exteriorized with little or no resistance. Other indicators would include responses to stimulation of body, feet, cornea, ears and tongue. The physiological parameters should be assessed and should include assessment of temperature, respiration, pulse and color of mucous membrane including condition of pharynx, gingiva and teeth. In case of emergency (depressed respiration or cardiac arrhythmias or depression) the animal should be revived. Emergency drug including cardiac and respiratory stimulants should be kept handy at all times. The physiological parameters should be assessed and should include assessment of temperature, respiration, pulse and color of mucous membrane including condition of pharynx, gingiva and teeth.
- (d) **Managing emergencies:** Emergency drugs and equipment would be available during the entire operation. Adequate supplies of emergency drugs should be ensured at all times.
- (e) **Composition of team:** Capturing large fields poses a challenge and therefore requires a skilled team comprising wildlife managers, biologists (if available) and veterinarians proficient in animal anaesthesia.

ANNEXURE-1A

Data Sheet for Recording and Monitoring Immobilized Animal

Area Details

Date _____
Location _____ GPS Lat _____ Long _____
Collar Frequency _____
Purpose of capture _____
Ambient temperature _____
Day (cloudy, bright) _____

Animal Details

Species _____
Physical condition _____
Emotional state before drugging _____
sex _____
Approximate age _____ Weight (kg) _____
Breeding status _____

Body Measurements

Nose tip to tip of tail _____ Noise tip to base of tail _____
Nose tip to base of skull (Occipital) Tail Length _____
Height (Shoulder blade of heel) _____ Hind limb length _____
Left fore limb or hind limb pay dimension Length _____
Width _____



Immobilization Details

<i>Name of Immobilizing Drug(s)</i>	<i>Time of Injection</i>	<i>Drug dose given</i>	<i>Route</i>	<i>Site</i>
<i>1.</i>				
<i>2.</i>				
<i>3.</i>				
<i>4.</i>				



Behaviour at the time of darting (running, walking, standing, excited)_____

Induction time when animal goes down/approached_____

Animal Monitoring

<i>Time</i>	<i>Signs shown following immobilization</i>	<i>Respiration Shallow/deep/irregular & rate</i>	<i>Temperature (°F)</i>	<i>Pulse(rate)</i>

Drug Reversal

<i>Name of reversal Drug(s)</i>	<i>Time of Injection</i>	<i>Drug dose & volume given</i>	<i>Route</i>	<i>Site</i>
1.				
2.				

Time when animal shows first sign of recovery_____

Details about recovery even till animal regains consciousness/ shows signs of recovery_____

Any other comments_____



Supplemental Drugs

<i>Name of the supportive drug(s)/antibiotic(s) etc. given</i>	<i>Trade name</i>	<i>Volume used</i>	<i>Route</i>	<i>Site</i>
1.				
2.				
3.				
4.				

Biological Sampling

<i>Name of sample</i>	<i>Preservative used</i>	<i>Examination required</i>	<i>Handed over to</i>	<i>Remarks</i>

ANNEXURE-II

GUIDELINES FOR DECLARATION OF BIG CATS AS 'DANGEROUS TO HUMAN LIFE'

(UNDER SEC 11 (1)(A))

- Both tiger as well as leopard are known to cause habituated loss of human life (animal dangerous to Human Life). Such confirmed animals which have become 'dangerous to Human Life' should be eliminated as per the statutory provisions provided in section 11 of the Wildlife (Protection) Act, 1972.
- Tiger as well as leopard are categorized under Schedule I of the Wildlife (Protection) Act, 1972, with highest statutory protection against hunting under section 9 (1) of the said Act. Hence, such species can be killed if they become dangerous to human life or are so disabled/diseased beyond recovery.
- Under section 11 (1) (a) of the Wildlife (Protection) Act, 1972, the Chief Wildlife Warden of a State alone has the authority to permit hunting of such animals becoming dangerous to human life or disabled or diseased beyond recovery. However, as per the statutory requirement, the Chief Wildlife Warden of the State has to state in writing the reasons for permitting elimination before hunting.
- There are several reasons for a big wild cat like tiger or a leopard to get habituated as becoming 'dangerous to Human Life', viz. disability due to old age, incapacitation due to serious injury or loss/breakage of its canines etc. However, there may be several exceptions, and hence



specific reasons have to be ascertained on a case to case basis.

- The tiger bearing forests and areas nearby prone to livestock depredation, besides having human settlements along with their rights and concessions in such areas, are generally prone to becoming 'dangerous to Human Life'. Besides, loss of habitat connectivity in close proximity to a tiger source area owing to various land uses also foster straying of tiger near human settlements, eventually ending up as an animal which is 'dangerous to Human Life'.

Suggested Steps on Loss of Human Life Due to Tiger/ Leopard

- Constitute a team for technical guidance and monitoring on day to day basis, as below:
 - A nominee of the Chief Wildlife Warden
 - A nominee of the National Tiger Conservation Authority A veterinarian
 - Local NGO representative
 - A representative of the local Panchayat
 - Field Director/Protected Area Manager/DFO I/C-Chairman
- Set up camera traps near kill sites, besides creating pug impression pads to monitor the day to day spatial movement of the wild carnivore.
- Inform the district officials (Collector/DM/SP) for duly alerting the local people to refrain temporally from the area where human death(s) has/have been reported, besides ensuring tranquility in the area from mobs/crowds of local people.
- Obtain/establish the ID of the aberrant animal causing loss of human life, through the committee constituted for the purpose, through camera trappings or direct sightings or pug impressions if camera trappings could not be done, besides collecting pieces of hair/scats of the carnivore (if available) for DNA profiling.
- A differentiation should be made between 'human kill' due to chance encounters and 'habituated animals which have become dangerous to Human Life'. As most of our forests outside protected areas are right burdened, the probability of chance encounters is very high. Further, tigers often use agriculture/sugar cane field and similar



cover along river courses while feeding on livestock or blue bull, which may also cause lethal encounters with human beings. Such animals should not be declared as 'Dangerous to Human Life'. However, confirmed habituated tiger/leopard which 'stalk' human beings and feed on the dead body are likely to be 'Dangerous to Human Life'.

- The declaration of an aberrant tiger/leopard as an animal which has become dangerous to Human Life requires considerable examination based on field evidences. At times, the human beings killed due to chance of encounters may also be eaten by the animal (especially an encumbered tigress in low prey base area). However, such happenings are not sufficient for classifying a tiger/leopard as a 'Dangerous to Human Life', which can best be established only after confirming the habituation of the aberrant animal for deliberate stalking of human beings, while avoiding its natural prey.
- Under no circumstances, mere an animal resorting to cattle depredation should be declared as 'dangerous to Human Life', despite the fact it may venture close to human settlements. To avoid untoward incidents in such situations, the efforts to trap the animal (chemical immobilization/use of traps) should alone be resorted to.
- Set up trap cages (automatic closure) in areas most frequented by the carnivore (with appropriate luring) for trapping.
- In case successive trapping operation fails set up an expert team for chemical immobilization of the aberrant animal as per the annexed protocol.

- The option of capturing the aberrant animal either through traps or chemical immobilization should be invariably resorted to as the first option. The wild carnivore thus captured, should be sent to a nearest recognized zoo and NOT released in the wild.
- Elimination of a tiger/leopard as a 'Dangerous to Human Life' should be the last option, after exhausting the option of capturing the animal live as detailed in the SOP.
- The Chief Wildlife Warden of the State after the above due diligence should record in writing the reasons for declaring the tiger/leopard as a 'dangerous to Human Life'.
- After 'declaring' the animal as 'dangerous to Human Life', its elimination should be done by a Departmental personnel having the desired proficiency, while providing the fire arm with the appropriate bore size. In case, such expertise is not available within the Department, an expert may be co-opted from the other competent Government Departments.
- No award/reward should be announced for destruction of animals which have become 'dangerous to Human Life'.

ANNEXURE-III

DETAILED INSTRUCTIONS FOR THE PROCEDURE TO BE FOLLOWED IN TIGER STRAYING INCIDENTS/ AREAS PRONE FOR SUCH INCIDENTS: PREVENTIVE/ PROACTIVE MEASURES

- (a) Identify the crisis spots/districts in the State.
- (b) Conduct science based research and analysis to arrive at reasons for frequent straying of tigers in such areas.
- (c) Prepare a Google map indicating forest patches, territory of the tigers, nearby habitation and corridors.
- (d) Form monitoring teams consisting of locals with wireless communication on 24×7 basis besides rapid response team.
- (e) Establish an early warning system.
- (f) Issue alert to all nearby villages to take utmost caution.
- (g) Monitor the cattle kill and immediately pay ex-gratia/compensation in the case of eventuality.
- (h) Use electronic surveillance to monitor the movement of the tigers during the night.
- (i) Water holes, cattle kill, transmission lines should be regularly monitored.
- (j) Put in place Rapid Response Team (RRT) for capturing the animal to avoid lethal encounter. The RRT to be equipped with the following:-
 - i. A field van/mini-truck with built in rails for accommodating a trap cage, with space for equipments, attendants and staff.

- ii. A tranquilization kit with drugs for chemical immobilization.
- iii. Taser gun for instant immobilization of the animal.
- iv. 2 mobile phones for continued communication with the authorities.
- v. 4 wireless handsets.
- vi. 2 GPS sets.
- vii. 1 long ranging night vision for seeing objects in the dark.
- viii. A digital camera.
- ix. 4 trap cages (2 for tiger and 2 for leopard).
 - x. 1 mini-tractor for transporting the cage in rugged terrain.
 - xi. 2 search lights.
 - xii. 2 radio collars with receiver and antenna.
 - xiii. 2 portable tents.
 - xiv. Portable hides – which can be set up fast, to be used for persons with tranquilizers
 - xv. 2 folding chairs with table.
 - xvi. Hand held audio system.
 - xvii. Rope and net.
 - xviii. First aid kits
- (k) The rapid rescue team is required to ensure unobtrusive close monitoring of the animal with least disturbance, for tracking its movement.
- (l) In addition, at places which are not waterlogged, camera traps should be set up (fixed to a post or a tree) for establishing the identity of the animal.



- (m) The rapid rescue team also requires due capacity building and 'hands on' field training involving the Wildlife Institute of India and other relevant outside experts, if needed.

ANNEXURE-IV

PRIORITISING AREAS FOR TIGER MONITORING

The tiger source areas and its surrounding forests have the maximum tigers, besides some protected areas and forest patches. The districts/forest divisions having spatial occupancy of tiger as indicated in the maps need ongoing monitoring on a daily basis. In this context, the following actions are indicated:

- (a) Monitoring the tiger source areas using camera traps to generate photo ID for creating a photo database (Phase-IV monitoring)
- (b) Implementing Phase-IV monitoring in areas having tiger occupancy as indicated in the map
- (c) Periodic comparison/review of camera trap tiger photos to fix ID of tigers reported in several areas near a source site
- (d) Complementing the camera trap monitoring with simple foot patrolling in the peripheral areas, while maintaining day-to-day record as per Phase-IV monitoring protocol
- (e) Monitoring livestock depredation by tiger and ready payment of compensation
- (f) Keeping track of sudden change in land use in areas having tiger presence
- (g) Avoiding blockage of traditional tiger/wildlife corridors in areas outside the tiger reserves falling in various forest divisions
- (h) Monitoring sudden change in cover values in tiger areas (change in cropping pattern etc.)



- (i) Monitoring tiger movement along river courses
- (j) Keeping track of insecticides sale outlets and their use in tiger bearing areas (to avoid poisoning of water)
- (k) Networking through local workforce for gathering information relating to wandering gangs traditionally involved in poaching of wild animals
- (l) Keeping track of local market days
- (m) Fostering creation/maintenance of wildlife monitoring register at the Gram Sabha level in areas outside tiger reserves, with incentives for informing tiger presence
- (n) Creation/maintenance of 'wildlife/tiger offence register' at the Gram Sabha level with reward system for assisting in crime detection
- (o) Deploying special monitoring teams around highways, open wells, railway tracks, electrical transmission lines, village ponds, natural water holes, irrigation canals
- (p) Insulating high tension electrical transmission poles in tiger bearing areas, besides covering open wells and irrigation canals
- (q) Keeping track of encumbered tigresses in tiger bearing areas for monitoring the dispersing young ones
- (r) Periodic checking of samples from water points/perennial water sources for lethal contamination
- (s) Alerting local people in right burdened, tiger bearing areas to prevent lethal encounters
- (t) Periodic disease monitoring of village cattle in the tiger bearing areas to avoid disease transmission to natural prey base for tiger
- (u) Monitoring natural salt licks to prevent poisoning/poaching in tiger bearing areas

- (v) Keeping track of local ironsmiths engaged in preparation of 'gin traps', snares etc.
- (w) Creation of wildlife crime dossier and exchange of such information with field units in tiger bearing areas under intimation to the NTCA
- (x) Fortnightly monitoring of tiger mortality and progress of tiger offence cases ongoing in the courts of law by the Chief Wildlife Warden
- (y) Monthly monitoring of tiger mortality and progress of tiger offence cases ongoing in the courts of law by the PCCF/HOFF
- (z) Use sniffer dogs for detection of body parts, escape routes and other leads

(The SOP has been prepared by the NTCA with inputs from Shri. P.K. Sen, Dr. Ullas Karanth, Ms. Prerna Singh Bindra, Dr. P.K. Malik, Dr. Parag Nigam and Field Officers)