

STANDARD OPERATING PROCEDURE
TO DEAL WITH
ORPHANED/ABANDONED TIGER CUBS
AND OLD / INJURED TIGERS IN THE WILD



MINISTRY OF ENVIRONMENT, FORESTS AND CLIMATE CHANGE

GOVERNMENT OF INDIA

NATIONAL TIGER CONSERVATION AUTHORITY



**STANDARD OPERATING PROCEDURE TO DEAL WITH ORPHANED/ABANDONED
TIGER CUBS AND OLD / INJURED TIGERS IN THE WILD**

1. **Title:** Standard Operating Procedure to deal with orphaned/abandoned tiger cubs and old / injured tigers in the wild.
2. **Subject:** Dealing with situations arising due to orphaned / abandoned tiger cubs and old / injured tigers in the wild.
3. **Reference:** Advisories of National Tiger Conservation Authority / Project Tiger on the subject.
4. **Purpose:** To ensure appropriate selection / rearing of orphaned/abandoned tiger cubs and old/injured tigers in the wild, to avoid undue interference with the natural process prevailing in the habitat, while avoiding their casualty / injury, besides safeguards for the field staff involved in the operation.
5. **Short summary:** This Standard Operating Procedure (SOP) provides the basic criteria, action and precautions required at the field level (tiger reserve or elsewhere) for dealing with orphaned/abandoned tiger cubs and old/sick/injured tigers in the wild.
6. **Scope:** The SOP applies to all tiger reserves and field formations with tiger presence.
7. **Responsibilities:** The Field Director would be responsible in the case of tiger reserves. For protected areas (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. **Causes / reasons / circumstances leading to orphaned/abandoned tiger cubs and old / injured tigers in the wild:**
 - A. **ORPHANED/ABANDONED TIGER CUBS**
 - a. Orphaned/abandoned tiger cubs due to mortality of mother (poaching / internecine combat / other natural causes)
 - b. Tiger cubs with in-born incapacitation
 - c. Weak tiger cubs / runt
 - d. Injured/sick tiger cubs



B. OLD / INJURED/SICK TIGERS

- a. Ageing and general debility to predate in nature
- b. Incapacitation due to injury (natural / internecine or other causes)
- c. Incapacitation due to loss of canines
- d. Inability to feed owing to porcupine quill injury etc.
- e. Sickness due to disease

9. Suggested field actions to deal with orphaned/abandoned tiger cubs and old/injured tigers:

- (a) At the outset, constitute a Committee (herein after referred as the Committee) for technical guidance and monitoring on a 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 local outside experts may be involved in the ongoing monitoring.
- (c) Establish identity of the tigress/cub(s)/old/injured/sick 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.
- (e) 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).
- (f) Restrain the abandoned/orphaned cub(s)/old/injured/sick tiger by deploying a cage or chemical immobilization in case of tiger cubs which are more than 30 days old.
- (g) Examine the said cub(s) by the Committee constituted as suggested above at para 9 (a) to make recommendations with respect to following objectives:
 - i. Rearing the tiger cubs in 'in-situ' enclosure for wilding / re-wilding towards subsequent release in the wild



- ii. 'Hard' release of tiger cubs in the wild
 - iii. Treatment of tiger cubs for rearing in zoo
 - iv. Rehabilitation of the injured / old tiger in zoo
- (h) 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. Sensationalization or distorted information can lead to further damage.
- (i) The Chief Wildlife Warden has to take the final decision on whether a cub has to be released back in the wild or transferred to a zoo.
- (j) It is important to have design suitable cages and a transportation protocol to avoid stress to the animal. Details in this regard are at **Annexure-A**.

10. Considerations with respect to above objectives at para 9

i. Rearing the tiger cubs in 'in situ' enclosure for wilding / re-wilding towards subsequent release in the wild

- (a) The tiger cubs should be healthy without any incapacitation (should be confirmed through veterinary examination).
- (b) The design and related details of the *in-situ* enclosure are at **Annexure-B**.
- (c) In case the tiger cubs are in infant stage, they should be hand reared in specially designed house-keeping facility within the *in-situ* enclosure as per protocol provided at **Annexure-C** till they are fit enough to stalk / appropriate a natural prey. Once the cubs are in a position to do so, they should be transferred to the larger portion of the *in-situ* enclosure.
- (d) Orphaned / abandoned tiger cubs which are known to accompany their mother while feeding on kills, should be released in the larger portion of the *in-situ* enclosure containing natural prey.
- (e) Two tiger cubs can be housed in the larger portion of the natural *in-situ* enclosure, initially for a period of two months, subsequent to which they should be housed in separate portions of the said enclosure having natural prey and cover.
- (f) Under no circumstances, tiger cubs of opposite sex should be reared together.
- (g) The house-keeping / daily watch & ward / maintenance of kill register should be entrusted to a dedicated small team of field staff, who should be retained to perform the said task till the wilding is completed.
- (h) The *in-situ* enclosure should be an 'off exhibit' area and under no circumstances it should be frequented by visitors (except for supervisory checks by senior officials of the reserve). This is important to avoid human imprint.
- (i) Presence of natural cover, forage, water should be ensured within the *in-situ* enclosure.



- (j) The provision for weed eradication should be ensured for the availability of natural forage / browse species for wild ungulates within the *in-situ* enclosure.
- (k) A portion of the *in-situ* enclosure should be exclusively maintained for *in-situ* rearing of natural prey animals which are sympatric in the habitat without any inter-specific avoidance.
- (l) Since natural wild prey increase in number in carnivore prone enclosures, an assessment of their number should be periodically done for releasing an appropriate number back in the wild to avoid stress conditions within the enclosure owing to competition for food and cover.
- (m) To avoid 'Pavlovian' conditioning of tiger cubs in the *in-situ* enclosure, the release of natural prey animals within the tiger enclosure should be carried out with minimum sound (like avoiding opening of shutters / gates / call by housekeeper etc.).
- (n) A day to day record of kills made by the tiger cub should be maintained through unobtrusive monitoring, with weekly supervisory checks.
- (o) The tiger cubs should be reared in the *in-situ* enclosure for a minimum of two years, and each cub should have a successful kill record of at least 50 prey animals, since 'wilding' process requires time.
- (p) Providing meat from external source should be avoided at all cost, except for infants where the protocol at Annexure-C should be followed.
- (q) The tiger cubs which have a successful kill record may be released in the wild in consultation with the NTCA after radio collaring, to a suitable, productive habitat within the same landscape, while considering the land tenure dynamics of tiger / presence of human settlements in the new area
- (r) The persons responsible or handling cubs must approach them by putting a tiger mask along with work day clothes of a tiger stripe pattern smeared with tiger urine and faeces to minimize imprinting to the extent possible

ii. 'Hard' release of tiger cubs in the wild

- (i) The tiger cubs should be in prime health and in dispersing age (three / four years).
- (ii) There should be no abnormality / incapacitation.
- (iii) At the time of immobilization, blood and serum samples may be collected for further analysis
- (iv) Radio collaring of the tiger cubs should be done prior to release at the new site.
- (v) The NTCA should be consulted prior to such a release, while providing details of the habitat / protected area where the release is proposed (prey base, land tenure dynamics of resident tigers, proximity to human settlements, protection status, etc.).

iii. Treatment of tiger cubs for rearing in zoo

- (i) All incapacitated / injured tiger cubs.



- (ii) Rehabilitation in a recognized zoo after initial treatment at site.

iv. Rehabilitation of the sick/ injured / old tiger in zoo

- (i) The tiger reserves / protected areas / forest habitats, having resident wild carnivores like tiger, need to be managed with minimum human intervention, with an overarching aim towards protection to foster welfare factors in a habitat, for the natural prey-predator balance and intra and inter-specific interactions to operate. This natural process is facilitated by the 'survival of fittest', through natural elimination of the aged / weaker individuals from a population. Therefore, it is not advisable to intervene in this natural process through artificial feeding of aged / incapacitated / injured wild tigers, which would amount to interference with their social land tenure dynamics and intra-specific interactions. Further, such practices may also lead to habituation of wild tigers which may lead to human-wildlife interface problems like livestock or human depredation.
- (ii) Artificial feeding of old / incapacitated wild tigers to ensure their longevity goes against the basic tenets of '*in-situ*' wildlife conservation and hence should not be done.
- (iii) Only in extreme situations, where an old/injured tiger may create human-tiger interface problems leading to livestock / human depredation, such tigers should be rehabilitated in a recognized zoo.

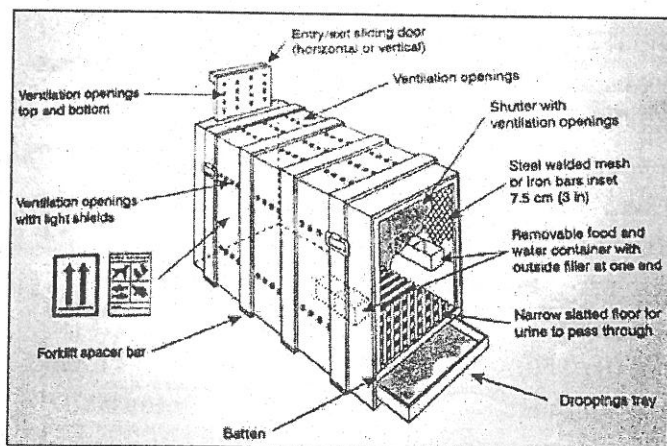


Design of cages / transportation protocol

TRANSPORTATION CAGES FOR TIGERS

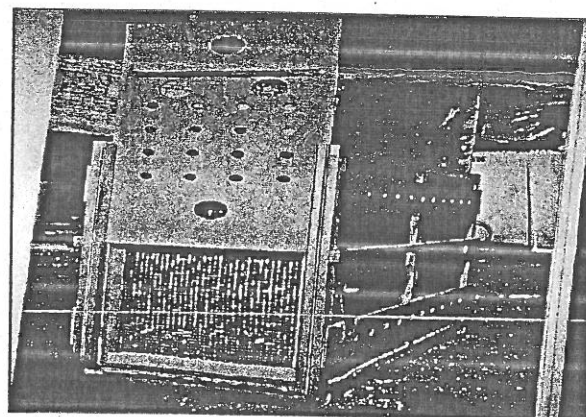
GENERAL CONSIDERATIONS:

- All tigers must be provided space to lie comfortably but not turn around
- There must be 10cm clearance around the animal when standing in normal position
- The height of the container should allow animal to stand erect with its head extended and length must permit it to lie in the prone position
- Plywood/fibre glass or equivalent material should be mounted on a solid wood or metal bolted/screwed frame. Plywood would give a strong and smooth interior
- Floor should be slatted over a liquid proof tray (splash proof) to collect the excreta
- Roof must be solid with ventilation openings
- The door should be made of steel welded mesh or strong iron bars, with bars being spaced such that the animal cannot pass its leg in between them. The front should also be provided with a sliding wooden shutter with ventilation holes or should be slatted
- Ventilation holes should be placed as shown in the figure



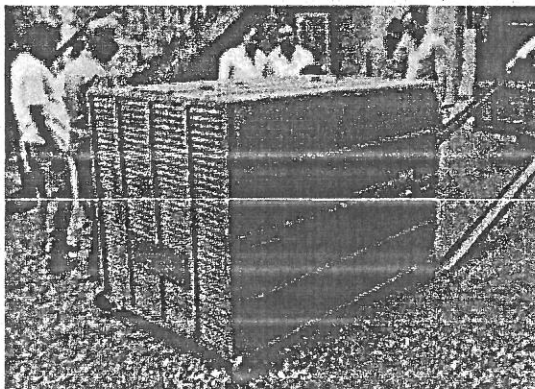
SCHEME AS OUTLINED BY IATA

A CAGE ON THE SAID SCHEME



SPECIFIC CONSIDERATIONS

- Average dimensions of a tiger
 - Length : 140 to 250 cm (Tail length 30 to 100cm)
 - Height : 60 cm
 - Weight : 100 to 300 kg
- Inner dimensions of the transport cage
 - Length: 195 cm
 - Height: 105 cm
 - Width : 75 cm
- Description of the cage
 - Both the sides should be with sliding doors
 - Frame- MS Angle 40 X 40 X 6 mm
 - Sides- 12mm thick plywood supported by MS flat 35mm, 4mm thick at a distance of 600mm from the outside and covered inside with an iron sheet of 3mm thickness
 - Roof- 12mm water proof plywood and covered inside with 3mm iron sheet
 - Doors- 12mm diameter MS plain bar, 50mm apart should be welded with the frame and covered with 5mm thick plywood. Bolt and chain system for opening and closing the door
 - Ventilation- Holes as depicted in the scheme above
 - Floor- 19mm thick plywood on MS flat 35mm X 4mm placed 350 mm apart. Floor also covered with 2mm iron sheet. 20mm dia holes cut out in the floor. Whole cage should rest on 50 X 50 mm iron pegs.
 - Excreta Trays- Two 25mm deep trays to be kept below the floor in between the iron pgs for removal of excreta and urine. They should be removable from either end and preferably separated by a wooden partition
 - Food and water- Small door of the size 100mm X 100mm should be made on one side for putting in food and pouring water
 - Side Handles- Four steel rings of dia 150mm of 12mm dia MS bar (2 on each side) be fixed at all four vertical members slightly above the midpoint. They are dual purpose- for lifting by crane as well as for tying with another cage while shifting



PROTOCOL FOR TRANSPORTATION OF TIGERS

GENERAL CONSIDERATIONS

- The entire transportation process should be conducted under the supervision of a veterinarian well versed in tiger physiology and who is duly registered with the state veterinary council or Veterinary Council of India. It is preferable if a veterinarian with prior experience of handling tigers is engaged for the purpose
- Tigers should be transported in closed crates/cages with adequate ventilation so as to disassociate them from the environment during travel. This helps to maintain a tranquil state
- The transport vehicle and the cage/crate should be sanitized before each travel
- Winter is the preferred season for transporting as temperatures are low and humidity is minimal. However, in case of sick and injured animals, transportation should be carried out as and when required
- In case the tiger has to be tranquilized or sedated for travel, the same should be carried out under the direct supervision of a veterinarian well versed with tiger physiology and the effect the drug may have on the animal
- In case the tiger falls sick or acquires an injury during transportation, the same shall be attended to by a veterinarian immediately
- While tigers can tolerate fluctuations in temperature, differences in environmental and climatic factors between the origin and the destination should be kept in mind prior to embarking on the journey
- Physical contact with the tiger during the course of transportation should be strictly avoided
- The excreta of the tiger and fomites such as utensils straw etc. should be handled carefully to avoid contamination and spread of disease
- Never cover the cage with tarpaulin/plastic sheet during transportation and ensure proper ventilation
- Cages/Crates should be constructed with adequate handholds for lifting/handling during transportation so as to avoid undue tilting or bringing the handlers in close contact with the animal
- A means of access to the food and water trough should be provided for refilling and cleaning during the journey
- Loading and unloading of the tiger should be preferably done in daylight
- Young tigers should not be transported alone and should be kept in proximity with another of the same species



- Drinking water is more important than feeding the tiger during transportation. Water should be given at the start (2 hours before starting) as well as on arrival. Care should be taken not to over feed the animal
- Water should be provided every 12 hours to the animal after which a 30 minute break in journey should be taken so that the water gets absorbed
- Feed should be provided every 24 hours for adults and 12 hours for young tigers. It is advisable to reduce the feed of the tiger initially so that it can be fed before the start of the journey. Feed should be provided again within 4 hours of reaching the destination
- Specific instructions for feeding and watering should accompany the tiger when being transported
- The face of the tiger should be in the direction of movement to minimize stress
- Transportation should follow the most direct route and preferably during dark as this encourages the tiger to rest
- All paperwork, travel documents and permissions from the concerned authority should be in order prior to commencement of the journey

SPECIFIC CONSIDERATIONS

- Selection of animal:
 - Tigers to be transported should be in good health
 - Pregnant/nursing/tigresses in estrus and geriatric animals should be invariably avoided for transportation
 - Ideally, only adults and sub adults should be transported. Adults should be transported only after the breeding season is over
 - Young ones unable to fend for themselves should be transported accompanied by a handler
 - In case of sick and injured tigers, the decision should be based upon status of their health and requirements
- Marking:
 - Tigers to be transported should be suitably marked by photographic capture to document their natural markings
 - Micro chipping may also be carried out if resources are available
- Capture and health screening: The tiger captured by physical/chemical means should be screened for routine haematological and serological parameters and with respect to diseases which may be potentially exotic at the destination, communicable to resident populations at the destination and also zoonotic in nature



- Route familiarization: The team undertaking the transportation should familiarize themselves with the route and plan in advance all the stops that shall be undertaken during the journey
- Record keeping: All records pertaining to the tiger should be compiled and maintained in multiple copies with various authorities
- All emergency veterinary drugs and equipment should be carried by the accompanying veterinarian to meet any exigency
- Financial requirements and implications should be kept in mind well in advance before undertaking the transportation
- Liaisoning with concerned authorities should be carried out as per procedure

REFERENCES:

1. 2012. Protocols for Transportation of Wild Animals. Central Zoo Authority, India
2. 1998. International Air Transport Association, *Live Animal Regulations*, 25th Edn
3. A Manual of Transport Cages and Nest Boxes. Singh, D.N., Malhotra, A.K., National Zoological Park, New Delhi



Annexure-B

Design and related details of the *in-situ* enclosure

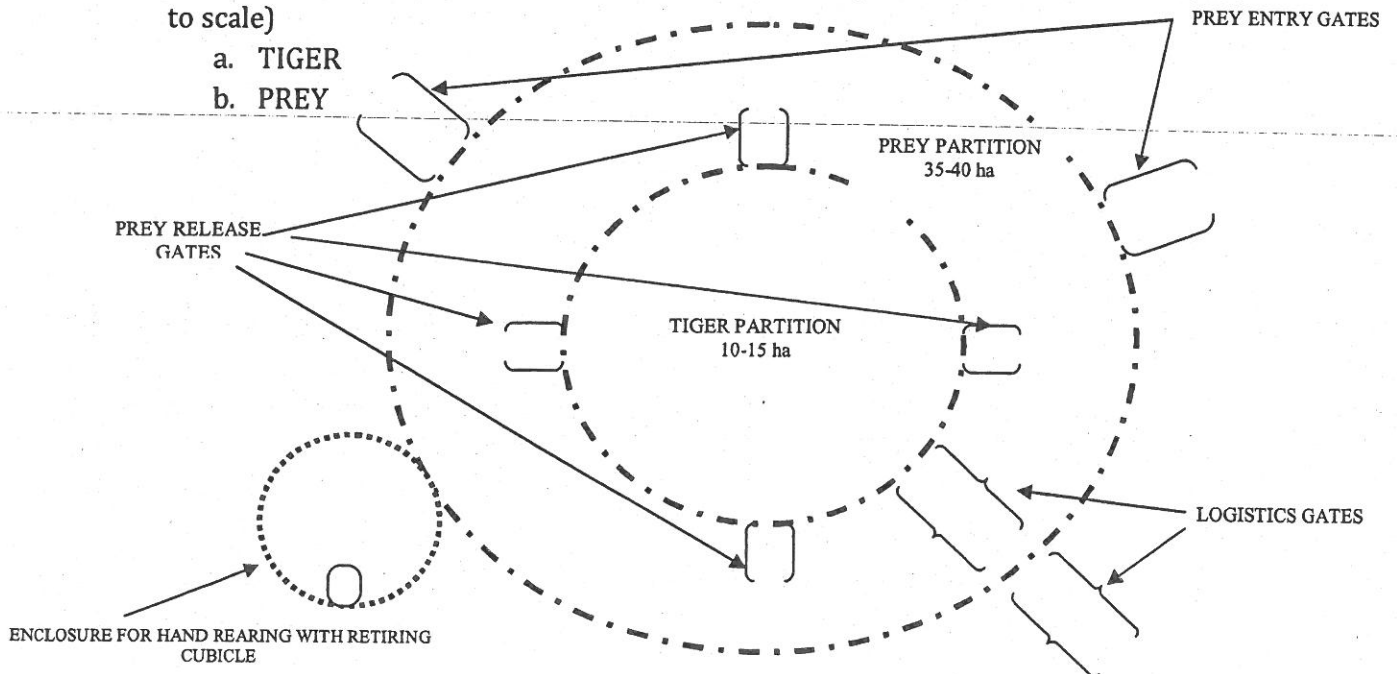
1. LOCATION: The location of the in situ enclosure should be chosen keeping in mind the following considerations
 - a. It should be well away from any anthropogenic activity/disturbance and especially away from the tourism zone of the tiger reserve. Tourism routes shall in no circumstance pass near the perimeter of the selected enclosure
 - b. The enclosure shall preferably be near a water source so that artificial water sources within it can be cleaned and refilled periodically as well as for maintenance of sanitation and hygiene of the retiring cubicle
 - c. The site should have features identical to the landscape in which it is present such as terrain, topography and habitat types. Habitat should be especially conducive for prey species to thrive
 - d. The site though to be created in isolation, should be accessible by motor vehicle in case of exigencies
 - e. The perimeter of the enclosure should be chosen such that tall trees which can act as vantage points for monitoring the enclosure can fall on it to the extent possible. This shall obviate the need to construct watch towers which shall save costs, labour as well as provide a more natural environment for the tiger to adapt and acclimatize. Even if a watch tower needs to be erected, it should preferably be done using naturally available material like tree poles/bamboo etc. to blend with the environs
2. SIZE: The size of the *in-situ* enclosure should be able to accommodate at least two tigers as orphaned cubs more often than not may be part of a litter. Practical experience has shown that once the site has been selected on the above criteria, size of 50 hectares as described below is suitable for 2 sub-adults, approaching adulthood.
3. DESIGN: The enclosure should be erected in a circular manner to the extent possible or as the topography may permit. Unnatural sharp edges are avoided at best.
 - a. Two concentric circular plots with the inner circle being 10-15 hectares and the outer being 35-40 hectares. The inner plot will house the tiger while the outer shall house the prey species
 - b. The inner plot has to be made carnivore proof to prevent free ranging carnivores from entering. The inside of this enclosure shall be "curtained" all around the perimeter up to a height of 6 feet with locally available tall grass/foilage to prevent visibility from inside as well as outside



- c. For the inner plot, angle iron, 15 feet above the ground, shall be placed 10 feet apart with the angle protruding towards the inside to prevent the tigers from moving out. For the outer plot however, the angle shall protrude out to prevent free ranging carnivores from preying upon the herbivores
- d. Chain link mesh shall be used to secure the perimeter with the angle posts as described above. The angle portion of the posts shall be secured with 4 strand barbed wire
- e. Four gates 15 feet wide placed diametrically opposite each other shall be provided for the tiger/inner plot to release prey as per decided protocol. These gates will be in the form of a wire meshed tunnel with sliding doors on both ends and shall be suitable camouflaged using locally available vegetation. Their mechanism is explained subsequently.
- f. One gate large enough to let an elephant/truck pass through shall be provided in both the outer and inner plot for logistics
- g. Two gates shall be provided in the outer plot to regulate prey. Once sufficient prey has been lured in, the gates shall be closed

4. PARTITIONING: This has been explained with the help of the enclosed scheme (not to scale)

- a. TIGER
- b. PREY



5. RELEASE OF PREY: The release of prey shall be done in an irregular manner based on the last kill by the tiger so as to approximate natural conditions to the extent possible.



- a. Prey population in the enclosure should be monitored for their health status and should be periodically released back in the wild vis-à-vis the habitat status to avoid stress/starvation
- b. Further, their release to the carnivore portion of the enclosure should be suitably adjusted by facilitating their passage from the larger, non-carnivore section
- c. The entire process has to be done erratically, following no fixed schedule and with minimum extraneous noise to prevent the development of a Pavlovian reflex in the tigers. Provision may be made to douse the sounds created with recorded sounds of the forest environment. However, here too care has to be taken to avoid conditioned reflexes developing in the tiger by playing these sounds even when food is not being introduced

6. HOUSEKEEPING

- a. The aim of housekeeping shall be to minimize the human imprint on the tiger
- b. The staff shall ensure that there is never a break in the integrity of the two partitions created by regular monitoring of the perimeters
- c. No extraneous material should make its way into either of the enclosures
- d. Housekeeping should be kept to a minimum in the enclosures so as to ensure an environment as close to a natural one
- e. The sliding mechanism of the tunnel gates described afore hand shall be regularly maintained to minimize sound during operation and reduce chances of the Pavlovian reflex from developing

7. HABITAT MAINTENANCE

- a. Removal of excessive leaf litter and other potential fire fuels shall be removed before the fire season from both the outer and the inner enclosures
- b. For the herbivore partition, grassland management in the form of harrowing followed by planting of indigenous grass slips shall be carried out
- c. The exotic weeds such as *Lantana*, *Eupatorium*, *Mikania* etc. shall be removed periodically
- d. The water sources, especially artificial ones shall be cleaned and refilled during the lean season
- e. Rotational grazing in the outside plot can be practiced to prevent the entire area from being grazed at a time

8. PROTECTION/WATCH & WARD

- a. As described during site selection, machans may be created at vantage points on tree tops for observing the behavior of animals (Tiger and prey) as well as monitor the habitat conditions over time



- b. The observers should be well versed in normal behavior of the animals to notice any deviance. This is especially with respect to appearance, gait and feeding of the animals
- c. The staff shall ensure that no domestic livestock including stray dogs are present in the vicinity
- d. The staff shall record observations in well defined formats with respect to behavioural parameters
- e. The staff shall be equipped with wireless sets to communicate any exigency/change from routine
- f. Special care is to be taken in fire prone/flood prone areas as one such event can result in a catastrophe as the animals are enclosed
- g. No straying tourist/tourist vehicle shall be allowed to venture close to the enclosure
- h. CCTVs can be set up at vantage points for monitoring

9. DAY TO DAY MONITORING

- a. Well defined formats shall be created with respect to general appearance (will include body condition, gait etc.) and feeding of animals
- b. Any undue disturbance in the habitat shall be recorded
- c. Time of releasing prey animals, habitat intervention, and time of conducting any chore shall all be maintained in a daily chart.

10. HEALTH CARE

- a. Body Condition Score/Health cards with respect to the local prey species shall be devised in consultation with an experienced veterinarian/Wildlife Institute of India which shall at a glance reflect the health condition of the animals in the enclosures
- b. A special watch of animal excreta with respect to its consistency needs to be noted on a daily basis as any deviation may act as a potential source of infection. In case diarrhea is noted, the excreta shall be removed on detection and the area covered with bleaching powder over which soil shall be spread to prevent animals from accidental ingestion of the chemical
- c. Periodic fecal examinations shall be done for both tigers as well as prey animals to determine parasitic load in the enclosure
- d. The natural orifices of animals should be observed daily to detect respiratory and gastrointestinal disturbances
- e. Compromised animals should be identified and attempts are to be made for their removal from the enclosure to prevent localized epidemics



11. RECORD KEEPING: Following records shall be maintained which shall be monitored by the Range Officer in their entirety. Test check of records shall be carried out by the ACF, Deputy Director and Field Director every month on field visits/surprise checks

- a. General Appearance
- b. Health record including interventions
- c. Habitat Interventions
- d. Schedule of activities for the day
- e. Feeding pattern/Release of prey
- f. Maintenance activities
- g. Reporting/Wireless register



Housekeeping details for rearing abandoned / orphaned new born tiger cubs

1. HOUSING LOCATION

- a. The housing location should be as close as possible to the final in situ enclosure and release site of the tiger so as to help it adapt to its environment
- b. It should preferably be a part of the in situ enclosure in the form of a retiring cubicle which has adequate safety provisions such as sliding/guillotine doors for handler safety as the cub grows older. The retiring cubicle should have an entry into the smallest partition of the in situ enclosure which can be removed when the cubs are ready to be released in to the larger part of the enclosure
- c. The size of the retiring cubicle should be twice as per CZA specifications as the cubs shall be hand reared for nearly 4 months : 5.5 X 3.6 X 3 m (lbh). The retiring cubicle should have provision of a squeeze chamber for administering drugs to the cubs once they are no longer amenable to handling
- d. Prefabricated material may be thought of which can be removed easily once the cub is permanently released into the in situ enclosure for rewilding
- e. The location should have sufficient ground water or be close to a water source as a substantial amount shall be needed to maintain the premise

2. FEEDING

- a. Body weight of the cub needs to be noted prior to commencement of feeding. One tenth of the body weight is the quantity of milk which needs to be given in total. This amount should be divided into five equal portions and fed at five equal intervals in a day
- b. Fresh cow's milk and milk powders should be generally avoided. Milk powders lead to dermal problems and diarrhea. Goat milk or bitch milk if available have been found to be suitable
- c. Avoid sugary solutions as cats cannot digest high loads of glucose
- d. For bottle feeding, have the cub stand on all fours and its head angled up so that no fluid enters the lung. A disinfected baby bottle with nipple can be used for the purpose. Make sure that the nipple rests above the tongue while feeding
- e. Milk replacers should closely simulate cat milk and should be prepared in the following manner
 - i. 20 gm skim milk powder



- ii. Dissolve in 90 ml of warm water
- iii. Add 30 gms egg yolk to the above
- f. Feeding regimen for the above milk replacer/ goat milk is as follows; Septran antibiotic syrup may be added to prevent infection. Excess of this antibiotic should however, be avoided as it may kill beneficial microbes which aid digestion. Multi vitamin syrup along with gripe water can be added to the milk to aid digestion.

Time Period	Feed to be given
Up to 45 days	Goat milk with above mentioned supplements
45 days to 60 days	Replace goat milk with chicken soup twice a day. If this protocol fails, mixing chicken soup with goat milk may be tried
Up to 60 days	Gradually replace milk with entire chicken soup
61 st day onwards	Fully boiled chicken pieces should be introduced in the diet
Up to 75 th day	Gradually replace chicken soup with fully boiled chicken pieces with bone
75 to 90 days	Provide fully boiled chicken with bone
90 to 105 days	Gradually replace fully boiled chicken with half boiled chicken
105-120 days	Introduce raw chicken and gradually replace half boiled chicken with raw
120-150 days	Introduce boiled beef soup along with raw chicken. This should be gradually replaced to fully boiled beef pieces to half boiled beef pieces to raw beef
From 6 th month onwards	Raw beef and raw chicken should be sustained in the diet

- g. Baits may be placed gradually in the partitioned area of the enclosure to encourage the cub to start stalking and hunting

3. HEALTH CARE:

- a. Cubs should be stimulated to urinate and defecate after feeding by massaging the ano-genital area with cotton moistened in water. This practice should be continued till 12-14 weeks till cubs start defecating on their own
- b. If diarrhea occurs, milk/milk replacer should be diluted with an ORS and total volume decreased by 30% for 8 to 12 hours. Stool culture may be obtained for pathogenic bacteria if suspected
- c. If diarrhea is severe and persistent, all oral intakes should be stopped for 12 to 18 hours and cub should be maintained on subcutaneous fluids. Gradually the cub should be started on oral electrolytes followed by dilute formula and returned to normal feeding over the next 12-24 hours
- d. Vaccinations are to be carried out in the following manner
 - i. 75 days/10 weeks/2 months: Canine Parvovirus, Canine Distemper, Hepatitis, booster after 3 months
 - ii. 3 months: Rabies



- iii. 5 months: Felivax (Feline panleukopenia and feline infectious rhinotracheitis)
- e. A watch for sudden acute symptoms such as fever accompanied by dullness and swelling of limbs is an indication of Trypanosomiasis and should be immediately treated. A prophylactic namely Trivax may be administered at one year of age but care should be taken to use the subcutaneous route only as it may cause abscesses at site of injection if given intra muscularly
- f. Deworming of the tiger cub should be carried out every 3 months
- g. Parameters such as heart rate, respiration, condition of the oral and nasal mucosa, moistness of the muzzle, urination and defecation should be observed daily
- h. Disposition of the animal especially appearance, gait and recumbency pattern should be closely monitored

4. TIMING OF TRANSFER TO NATURAL PORTION OF THE ENCLOSURE

- a. In ordinary circumstances, a tiger cub can spend up to 2-2 and half years with the mother acquiring skills for surviving in the wild.
- b. However, in case of an orphaned cub which has been hand raised and which has been weaned of bottle feeds by 12 to 16 weeks of age, may be released into the limited partition mentioned above by 24 to 36 weeks depending upon its response
- c. The cub may finally be released into the entire natural portion by 2 to 2 and a half years of age so that it starts conditioning to the wild

5. PROTECTION/WATCH AND WARD

- a. The Animal keeper should be trained in essential tiger behavior so as to observe deviant signs. Feeding regimens should be adequately explained to the keepers along with preparation method
- b. Based on the areas sensitivity 2 animal keepers on rotation with suitable number of forest staff should be placed in the chowkidar enclosure
- c. They should watch out for essential health signs mentioned above
- d. They should keep the entire premises clean and observe the animal at periodic intervals in the day
- e. They should strictly maintain a nutrition chart, health chart and general observation chart in a chronological manner
- f. They should keep a watch on the integrity of the building so that poisonous reptiles do not take a toll on the tiger cub



- g. While the *in-situ* enclosure will be erected deep inside the forest away from anthropogenic activity, the personnel shall keep a strict watch for stray livestock and stray dogs
- h. CCTVs can be set up at vantage points for monitoring

6. SANITATION AND GENERAL HOUSEKEEPING

- a. Area should be cleaned with a 50% bleaching powder solution prior to arrival of the cubs
- b. The area should be cleaned daily with a 50% bleach solution subsequent to which the area should be treated with water to avoid any dermal reactions to the bleach
- c. A footbath should be placed at the entrance with bleach or potassium permanganate solution
- d. Disinfectant spray should be used on the gates and latches on a regular basis
- e. There should be a single handler who should thoroughly wash and sanitize his hands before handling the cub
- f. Any fecal matter in the enclosure should be removed to avoid coliform infections as well as prevent fly/vector borne diseases
- g. All utensils/equipment/fomites like straw, bedding etc. which have come in touch with the tiger cub as well as the handler should be washed and cleaned daily and periodically dipped in a disinfectant solution subsequent to which it should be washed with plain water again to remove traces of the chemical
- h. Multiple units of dedicated clothing for inside enclosure activity (with a tiger stripe pattern and colour) should be provided which has to be disinfected using preferably an autoclave. On no account should clothes worn by handlers outside be permitted inside while handling the cub



SAFEGUARDS FOR FIELD STAFF

Two principles serve as the basis for selecting appropriate safeguards:

1. Protection of personnel from such hazards as allergens, infectious/zoonotic disease, and physical hazards (e.g., bites, noise, burns, chemical hazards, etc.) and
2. Protection of animals from the introduction of disease

Following are the measures which need to be adopted to achieve the essence enshrined in the above principles

- Use of Personal Protective Equipment (PPE): This includes the use of the following:
 - Moisture impermeable gloves. Hand washing is an important adjunct to wearing gloves for which medicated soap along with copious amount of free flowing water should be used
 - Disinfected gum boots which should not be moved out of the workplace. In fact, even when within the enclosure, they should always be dipped in the footbath when approaching the animal chamber. Alternatively, if shoes from outside environment are being used, they should be covered with a disinfected plastic cover
 - Plastic transparent Goggles if available should be used while attempting medication or a surgical procedure to avoid infection through the eye
 - Plastic or paper head gear should be used while preparing food for the animal
 - A dedicated facility uniform (preferably a Dangri designed in tiger stripes pattern and colour) in 2-3 sets should be provided to the animal keeper which should not move out of the facility and should be periodically sterilized using an autoclave
 - Bite resistant gloves can be used when dealing with cubs
- Personal hygiene
 - All staffs engaged in rearing of tigers should wash their hands thoroughly with soap and water after their daily ablutions
 - No staffs should be allowed to defecate in the open near the tiger enclosure. If facility of a toilet are not available then a pit should be dug which shall be covered after use and bleaching powder spread on it
 - Nails of the animal handlers should always be trimmed
 - Animal Handlers should de-worm themselves once in 6 months irrespective of signs and symptoms
- All waste emanating from the enclosure should be incinerated properly or buried and covered with bleaching powder
- Prophylaxis



- The staff should get themselves checked for the following zoonoses every 6 months
 - Tuberculosis
 - Anthrax
 - Brucellosis
 - Toxoplasmosis
 - Leptospirosis
 - Fungal infections especially dermal
- A health card in the name of each personnel engaged in the management of the enclosure should be made wherein routine hematological and serological parameters are recorded along with the aforesaid screenings
- The staff shall keep in check all guillotine doors and barriers to prevent the tiger cubs from escaping out
- The staff should keep a checklist of various activities involved in different protocols and follow them diligently for their own safety and for the safety of the tiger cubs



Guidance Notes

1. Habituation

Habituation is a learning process where animals 'learn' not to respond to certain stimuli which have proved 'harmless' or of 'no consequence'. It is a common phenomenon and plays an important role in selection of habitats and inter-specific relationships between wild animals. Thus, a wild animal, placed in new surroundings, may initially exhibit fear but would subsequently lose the fear owing to habituation. Further, congenial habituation may also result in positive response in such animals. Thus, during *in-situ* rearing of tiger cubs repeated familiarization with human beings or objects may result in strong habituation making 'wilding' difficult.

2. Conditioning

It is a behavioural response which is acquired by an organism through experience, usually through the association of a stimulus with a reward. If the said stimulus is associated with a rewarding experience, it results in a 'positive reinforcement'. On the other hand, 'negative reinforcement' takes place if the stimulus results in a 'painful' experience to the animal. Thus, in the process of *in-situ* rearing association of sounds (opening of enclosure gates, sound of vehicle movement etc.) with the availability of food would result in conditioning to such stimuli which would hamper wilding.

3. Critical distance (wilding / rewilding)

'Critical distance' may be understood as the minimum distance to an unfamiliar / strange object tolerated by a wild animal. Violation of this distance would elicit a response which may result in fleeing of the wild animal from the site or attack by the wild animal on the object. Such a critical distance in the context of human-beings is non-existing in domesticated animals. In the wilding process of tiger cubs reared under *in-situ* conditions, it is extremely important to restore the behaviour relating to critical distance (wilding) by ensuring complete seclusion from human-beings and their associates (unobtrusive monitoring).

4. Imprinting

This is a process of learning wherein an animal recognizes and becomes attached to a particular object in its early life (critical time). The critical time of imprinting may vary from few hours to several days, soon after birth depending on the species. In the wilding process of tiger cubs, this social attachment requires to be carefully avoided.

