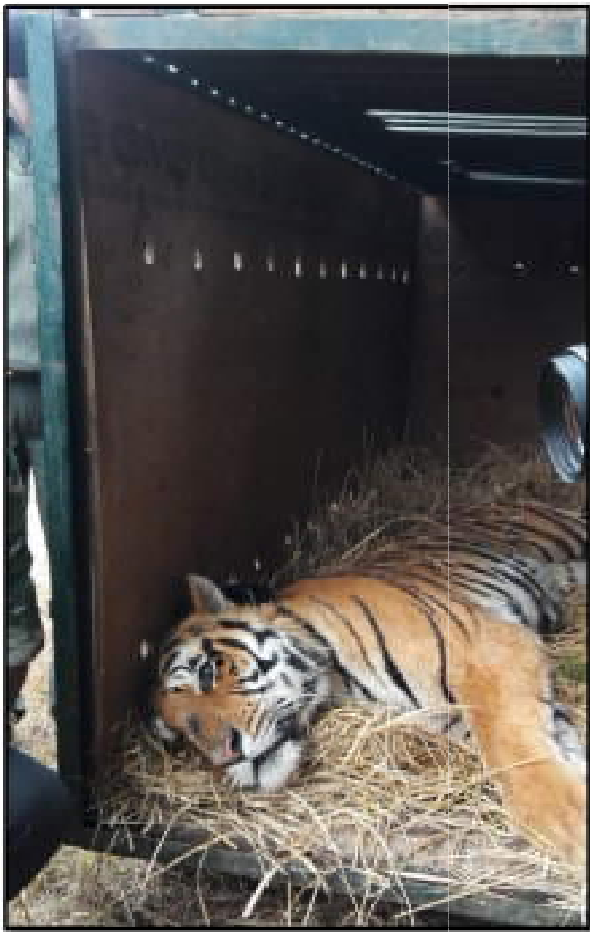


**SPECIES SPECIFIC CAGE DESIGNS TO RESCUE & TRANSPORT
THE WILDLIFE & NEST BOXES FOR BIRDS**



STATE FOREST RESEARCH INSTITUTE, JABALPUR (M.P.)

(2019)

**SPECIES SPECIFIC CAGE DESIGNS TO RESCUE & TRANSPORT
THE WILDLIFE & NEST BOXES FOR BIRDS**

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Submitted to



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Submitted by



State Forest Research Institute, Jabalpur (M.P.)

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1. Introduction

Wildlife is often found entering inside the human habitation. It might be due to lack of their life requisite parameters at their original habitats (eg. Scarcity of water or food) or due to other ecological factors (eg. dispersing of individuals from their natal areas). For any rescue operation/translocation programme, how animals are captured and the impact of trapping on animal populations is a major concern looking to the safety of the animal. Cages used in rescue operation should meet performance criteria that address state-of-the-art trapping technology and that optimize animal welfare conditions within the context of the research. It was observed that the animal found injured while trying to escape from the cages. It might be due to improper designing of cages or material used for preparing cages. Any rescued animal found to be under tremendous stress, become very aggressive which may cause serious injuries to the animal or sometime results even its causality.

The Government of India has enacted the Animal Transportation Rules, 1978 under the Prevention of Cruelty to Animals Act, 1960 which inter alia is applicable for transportation of the domestic animals and non-human primates. The International Air Transport Association follows the Live Animals Regulations for air transportation of the live animals. The provision of Convention on International Trade in Endangered Species of Flora and Fauna (CITES) is also applicable in the International transportation of animals. The various provisions of these treaties, enactments etc. applicable at the time of transportation of the animals should be taken into consideration.

Forest of Madhya Pradesh, harbor many rare and endangered wild animals and birds. From large bodied cat species like, tiger, leopard to sloth bear, various deer species like chital, sambar, gaur & barasingha are found in various Protected Areas and territorial divisions. The current protocol on **“Species specific cage designs to rescue & transport the wildlife and nest boxes for birds”** is compiled based on the guidelines by Central Zoo Authority (2012), International Air Transport Association, CITES and designs used by State Forest Department of Madhya Pradesh to rescue & transport wildlife. The rescued vehicle/ transport vehicles have been well designed by State Forest Department of Madhya Pradesh.

During compilation of this information important regulations & provisions under International Air Transport Association have been taken into consideration.

In this suggested protocol, information has been provided on various species specific cages, transportation vehicles, bird cages and trap cages.

All possible precautions should be taken in advance to ensure the animal's health. The walls and roof should be of solid construction. The floor of the cages should be slatted, or of suitable mesh, and positioned above a removable, waterproof tray with a sufficient quantity of absorbent material. There should be no sharp edges or projections on the inside surfaces of the cages.

As per International Air Transport Association guidelines, any ideal transportation container shall have following design (**Figure-1**). Its dimensions can be changed according to the shape and size of species.

Dimension – The height of the container must allow the animal to stand erect with its head extended and the length must permit to lie in the prone position. The measurements will vary with the species involved.

Frame – The Frame must be made from solid wood or metal bodied or screwed together. The frame must provide the spacer bar to provide stability to the structure, 2.5 cm depth to the sides for air circulation. When the weight of the container plus animal exceeds 60 kg or the animal is very aggressive the frame must have addition metal re-enforcing braces.

Sides – Suitable plywood or similar material must line the frame to give a smooth and strong interior. Others details should be as per the design given below:-

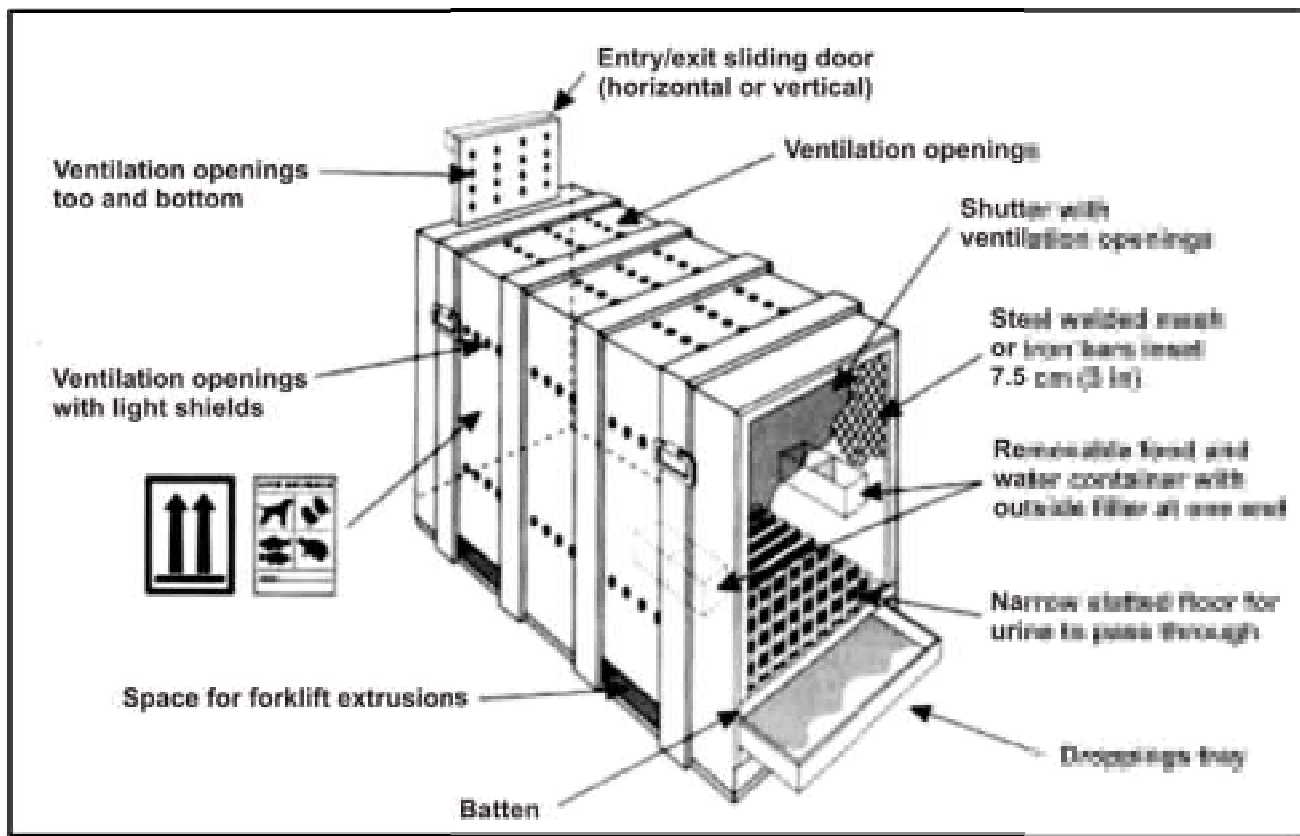









Figure-1: An ideal container design, its dimensions can be changed according to the shape and size of species (Source: www.iata.com)




i. Design of transport cages -



Designing of cages to rescue or transport for wildlife species are given below. It is based on Central Zoo Authority guidelines prepared by Singh and Malhotra (2008) and CITES guidelines and the prevailing cage designs already being used by State Forest Department of Madhya Pradesh:-


Wildlife (Body weight & size)	Cage size (Length X width X Height in cm)	Remarks
<p>Tiger Length – 140-250 cm Height- 60 cm Weight-90- 200 kg</p>	<p>195 X 75 X 105</p> 	<p>Frame: MS angle 40mmX40mmX6mm Slides: 12 mm thick water proof plywood with cover of 3mm thick iron sheet. Floor: 19 mm thick water proof ply on MS flat 35 mm x 4mm Wholes on floor shall be 20 mm diameter. Whole crate should be rest on floor 50 mm X 50 mm iron pegs. Two removable trays of depth 25 mm to be provided below the floor for urine and excreta.</p>
<p>Leopard Length – 115-215 cm Height- 55-70 cm Weight-35- 70 kg</p>	<p>120 X 60 X 90</p> 	<p>Frame - MS angle 40 X 40 X 6 mm. Sides - 12 mm thick plywood supported by the M.S. flat 35 mm, 4 mm thick at the distance of 600 mm C/C from the outside and inside cover with iron sheet of thickness of 3 mm Roof - With 12 mm water proof ply covered inside with 3 mm thick iron sheet. Doors - 12 mm dia. M.S. plain bar @ 50 mm C/C should be welded with frame and covered with 5 mm thick plywood. Bolt and chain system for closing and opening the doors. Ventilation - Holes on both sides. Floor - 19 mm thick water proof ply on M.S. flat of 35 X 4 mm @ 350 mm C/C. Floor and two sides</p>


		<p>also covered from inside with iron sheet of 2 mm therein. Holes on floor 20 mm in dia. Whole cage should rest on 50 X 50 mm iron long pegs. Two 25 mm deep removable trays to be kept below the floor to receive urine and excreta. It should be draw-able from each door side in opposite direction. In the middle a wooden partition to be given to keep two trays separate.</p>
<p>Sloth bear Length – 140-170 cm Height- 65 cm Weight-90- 110 kg</p>	<p>180 X 75 X 100</p> 	<p>Frame - MS angle 40 X 40 X 6 mm. Sides - 12 mm thick plywood supported by the M.S. flat 35 mm, 4 mm thick at the distance of 600 mm C/C from the outside and inside cover with iron sheet of thickness of 3 mm Roof - With 12 mm water proof ply covered inside with 3 mm thick iron sheet. Doors - 12 mm dia. M.S. plain bar @ 50 mm C/C should be welded with frame and covered with 5 mm thick plywood. Bolt and chain system for closing and opening the doors. Ventilation - Holes on both sides. Floor - 19 mm thick water proof ply on M.S. flat of 35 X 4 mm @ 350 mm C/C. Floor and two sides also covered from inside with iron sheet of 2 mm therein. Holes on floor 20 mm in dia. Whole cage should rest on 50 X 50 mm iron long pegs. Two 25 mm deep removable trays to be kept below the floor to receive urine and excreta. It should be draw-able from each door side in opposite direction. In the middle a wooden partition to be given to keep two trays separate.</p>
<p>Crocodile/ Gharial Length – 245-250 cm Height- 40-45 cm Weight-40-60 kg</p>	<p>195 X 60 X 40</p>  <p>Front door opening cage with ventilation</p>	<p>Small size young reptiles are preferred. Metal inside should be avoided. The space should be enough to allow the animal to lie in a natural position. Frame - Solid wooden batten of the size of 35 X 35 mm Sides - Water proof ply of 12 mm in</p>

	 <p style="text-align: center;">Side door opening cage</p>	<p>thickness with 35 X 35 mm solid wooden batten as support (4 nos.) Floor - Water proof ply of 12 mm in thickness. Put saw dust in it. Roof - Water proof ply of 12 mm in thickness. Having two small windows of wire mesh of the size of 250 X 250 mm on the top. Doors - Sliding on both sides with 12 mm thick water proof ply. Ventilation - Holes on sides and top as required.</p>
<p>Primates (Hanuman Langur/ Rhesus Macaque) Length – 50-60 cm Height- 30-40 cm Weight-3-8 kg</p>	<p style="text-align: center;">90 X 68 X 75</p> 	<p>There should be enough space for the animal to turn around. Frame - Solid wooden batten 35 X 35 mm all around. Sides - Water proof plywood 12 mm thick Floor - Water proof plywood 12 mm thick. Put saw dust on the floor. Roof - Water proof plywood 12 mm Doors- Only one side with up slide facility made up of 12 mm thick Water proof plywood. Ventilation - Holes on two sides of 20 mm diameter. Welded mesh of the size 12 X 12 mm at rear top side. The width of welded mesh may be 100 mm. Food & container - Bowl for food and water. Side bars - Two handles (one on each side) of good quality be provided.</p>
<p>Medium body sized species (eg. Jungle cat, wild dog, Jackal, Civet etc.) Length – 70-80 cm Height- 35-40 cm Weight-3-15 kg</p>	<p style="text-align: center;">80X 45X45</p> 	<p>There should have enough space for the animal to turn around. For Civets, all the inner sides be covered with aluminium sheet because of wood cutting habit. Frame - Solid metal batten of size of 35 X 35 mm Sides - Iron mesh of 5 mm thickness. Floor – Solid metal of 6 mm thickness, put saw dust on the floor. Roof – Iron mesh of 5 mm thickness. Doors - Only on one side with up slide facility made up of iron mesh 5 mm thickness. Ventilation – Square Mesh size of 2cm x 2cm</p>

<p>Snakes (Cobra or similar body sized snakes)</p>	<p>60 x 75 x 30</p> 	<p>Frame - Solid wooden batten of 25 X 25 mm size Sides - Water proof ply of 9 mm in thickness with wire mesh on two sides. Floor - Water proof ply of 12 mm in thickness. Roof - Water proof ply of 12 mm in thickness with hinges and kundas to make them openable from the top to act as a door. For lifting - Two side handles, on each side to lift.</p>
<p>Python</p>	<p>75 x 90 x 45</p> 	<p>These dimensions may be changed as per the size of the python species. Wooden box with dry padding on floor and holes on the sides and top should be provided. There should be enough space to allow animals to lie down comfortably. Frame - M S angle of 25 X 25 X 4 mm and with additional support of M S flat of 25 X 4 mm as required. Sides - Water proof ply of 19 mm in thickness and wire mesh on two sides. Floor - Water proof ply of 19 mm in thickness. Put dry paddy. Roof - Water proof ply of 19 mm in thickness with hinges and locking arrangements. The top will act as a door. Ventilation - Holes on sides as per requirement. For lifting – Two side handles one on each side to lift.</p>
<p>Gaur Length – 250 cm Height- 150-180 cm Weight-450-750 kg</p>	<p>This cage size is for individual gaur 300 X 200 X 200</p> 	<p>The height and width of the cage must allow the animal to stand erect with its head extended. The size must restrict movement so that animals cannot turn around and in so doing traps or injures itself nor have space to kick and damage the crate. Transport vehicle designed by Kanha Tiger Reserve (Madhya Pradesh Forest Department) is used these days for transportation of Barasingha, Sambhar, Cheetal</p>

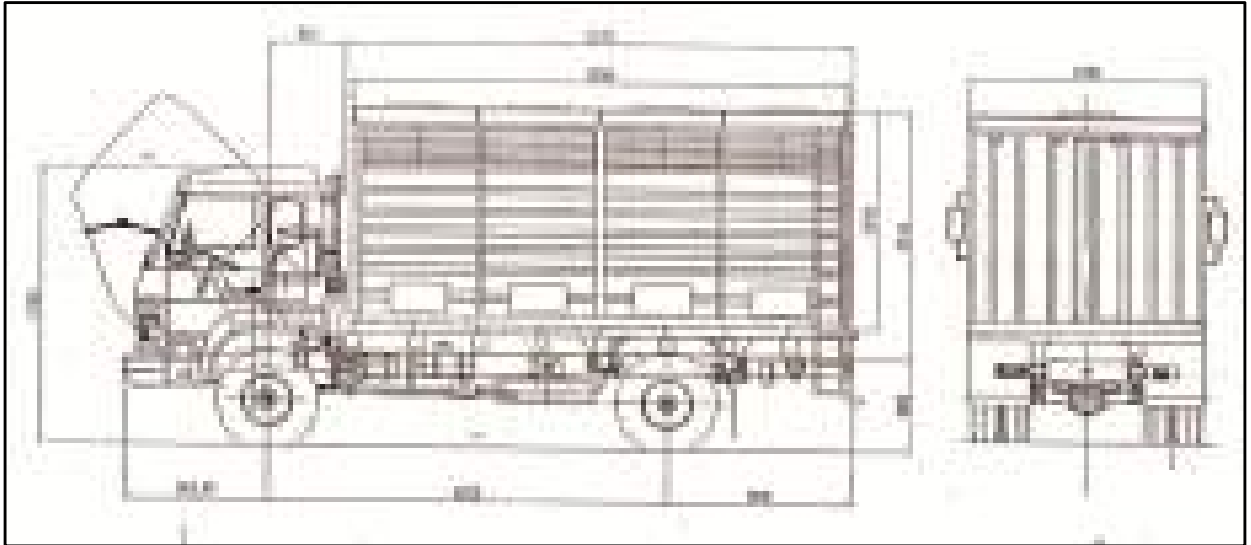
		<p>& Bluebull also. Mass capturing is being done through Boma technique. Detail of the size and dimension has been mentioned in Transportation vehicle details on page number 12</p>
<p>Spotted Deer Length – 100-150 cm Height- 50-90 cm Weght-25-80 kg</p>	<p>150 X 55 X 120 This dimension is for individual capturing</p> 	<p>The height and width of the cage must allow the animal to stand erect with its head extended. The size must restrict movement so that animals cannot turn around and in so doing traps or injures itself nor have space to kick and damage the crate. Frame - All around solid wooden batten of size 75 X 50 mm or 40 X 40 X 4 mm M.S. angle. Sides - Plywood water proof 12 mm thick Floor - 19 mm thick water proof ply (put wood or saw dust on the floor.) Roof - Water proof plywood 12 mm thick Doors - Water proof ply 12 mm thick, sliding doors on both sides with bolts and chain. Ventilation - holes on side (20 mm in dia, minimum 10 holes on each side) Food & container - Stalk of grasses and water container Side bars - Two wooden side handle of 35 X 50 mm size, one on each side for lifting. In case if the frame of the cage is of steel then we should used four steel rings of dia. 150 mm made of 12 mm dia on M.S. bars, one on each corner.</p>
<p>Barking deer Length – 130-150 cm Height- 50-60 cm Weght-9-12 kg</p>	<p>95 X 45 X 75 This dimension is for individual capturing The design will be the same which are using for spotted deer, only dimensions will be different.</p>	<p>The height and width of the cage must allow the animal to stand erect with its head extended. The size must restrict movement so that animals cannot turn around and in so doing traps or injures itself nor have space to kick and damage the crate. Frame - All around solid wooden batten of size 75 X 50 mm or 40 X 40 X 4 mm M.S. angle. Sides - Plywood water proof 12 mm</p>

		<p>thick</p> <p>Floor - 19 mm thick water proof ply (put wood or saw dust on the floor.)</p> <p>Roof - Water proof plywood 12 mm thick</p> <p>Doors - Water proof ply 12 mm thick, sliding doors on both sides with bolts and chain.</p> <p>Ventilation - holes on side (20 mm in dia, minimum 10 holes on each side)</p> <p>Food & container - Stalk of grasses and water container</p> <p>Side bars - Two wooden side handle of 35 X 50 mm size, one on each side for lifting. In case if the frame of the cage is of steel then we should used four steel rings of dia. 150 mm made of 12 mm dia on M.S. bars, one on each corner.</p>
<p>Sambhar/Blue bull Length – 170-200 cm Height- 130- 145 cm Weight-150- 200 kg</p>	<p>180 X 68 X 150 This dimension is for individual capturing</p> 	<p>The height and width of the cage must allow the animal to stand erect with its head extended. The size must restrict movement so that animals cannot turn around and in so doing traps or injures itself nor have space to kick and damage the crate.</p> <p>Frame - All around solid wooden batten of size 75 X 50 mm or 40 X 40 X 4 mm M.S. angle.</p> <p>Sides - Plywood water proof 12 mm thick</p> <p>Floor - 19 mm thick water proof ply (put wood or saw dust on the floor.)</p> <p>Roof - Water proof plywood 12 mm thick</p> <p>Doors - Water proof ply 12 mm thick, sliding doors on both sides with bolts and chain.</p> <p>Ventilation - holes on side (20 mm in dia, minimum 10 holes on each side)</p> <p>Side bars-Two wooden side handle of 35 X 50 mm size, one on each side for lifting. In case, if the frame of the cage is of steel then we should used four steel rings of dia. 150 mm made of 12 mm dia on M.S. bars, one on each corner.</p>
<p>Barasingha or Swamp deer Length -175-200 cm</p>	<p>165X60X150 This dimension is for individual capturing</p>	<p>The height and width of the cage must allow the animal to stand erect with its head extended. The size must</p>

<p>Height -135-140 cm Weight-160-180 kg</p>	<p>The design will be the same which are using for samber, only dimensions will be different.</p>	<p>restrict movement so that animals cannot turn around to avoid injuries. Frame - All around solid wooden batten of size 75 X 50 mm or 40 X 40 X 4 mm M.S. angle. Sides - Plywood water proof 12 mm thick Floor - 19 mm thick water proof ply (put wood or saw dust on the floor.) Roof - Water proof plywood 12 mm thick Doors - Water proof ply 12 mm thick, sliding doors on both sides with bolts and chain. Ventilation - holes on side (20 mm in dia, minimum 10 holes on each side) Side bars - Two wooden side handle of 35 X 50 mm size, one on each side for lifting. In case if the frame of the cage is of steel then we should used four steel rings of dia. 150 mm made of 12 mm dia on M.S. bars, one on each corner.</p>
<p>Elephant Adult Length – 550-640 cm (Including trunk length 150-200 c m and tail length 120-150 cm) Height- 270-280 cm Weight-5000 kg</p> <p>Elephant Calf 3-4 yrs Length – 180-240 cm (Including trunk length and tail length) Height- 110-150 cm Weight-200-500 kg</p>	<p>350 X 300 X 320 For Adult elephant</p> <p>240 X 120 X 180 For Elephant Calf</p> 	<p>The size and strength of the cage must be sufficient to restrict the movement as well as restrain the animal. The animal should be able to stand naturally and should not able to move freely. Frame - Main chamber made up of M S angle iron of the size of 65 X 65 X 8 mm, support chamber of the size of 40 X 40 X 6 mm M.S angle. Sides - Water proof ply of 19 mm thickness fixed on steel frame. Floor - Wooden planks of 50 mm thickness fitted on steel frame. Roof - same as floor. Doors - Made up of 16 mm dia M.S bar and up slide type. Three horizontal pipes of dia 50 mm would be installed on both sides (exit & entry) just before the up-slides gates at equal vertical distance. Each pipe will have a hole of dia 15 mm on both ends for locking purpose. Ventilation - Narrow slits in plywood on each side.</p>

ii) Design of transportation vehicle-

Following transportation vehicle using by all the Tiger Reserves of Madhya Pradesh Forest Department for transportation of wild animals -



Picture 2– Transportation vehicle design for wild animals
(Source – Kanha Tiger Reserve)

Specifications:-

- Body Dimensions - 5250 X 2500 X 2250 mm
- Chassis - TATA LPT 1613 / 42
- Floor Plate - 3 mm
- Formed Side panel & Door - 1.6 mm
- 01 Nos. Center partisan wall with sliding door
- 01 Nos. Front & 01 No rear opening door both side
- 04+ 03 Lower window & 04 Nos top window
- 02 Nos. Compartment

- Note:-
- 1) This is a general information drawing
 - 2) The chassis specifications are provided by TATA
 - 3) The general tolerance to be taken as ± 10 mm.

**Transportation vehicle using by Kanha Tiger Reserve,
Madhya Pradesh Forest Department**



Front View



Side View

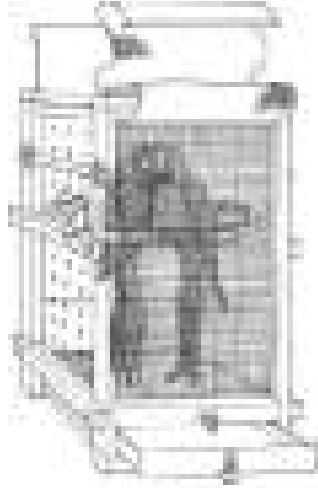
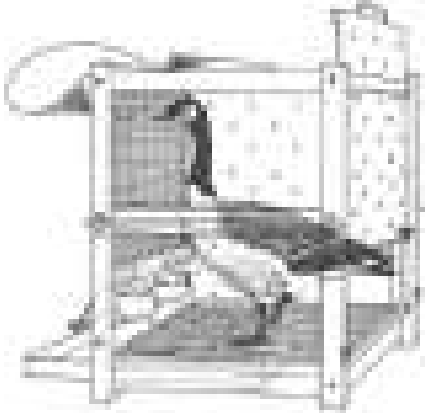



Inside View



Back View

iii) Design of Bird cages

Birds species	Bird cage size (Width X Depth X Height in cm)	Notes
<p>Parakeets</p>	<p>12-24 X 40-60 X 20</p> 	<p>Nest -The Parakeets make their nests in hollow of a large tree. The height of hollow from ground varies. It may be 10 to 25 meters above the ground. These are the inner dimensions. Description: Sides - Water proof ply of 12 mm in thickness. Roof - Triangle shape or plain. It should be open able on hinges to clean and inspect the eggs and young. Hole – 2-12 cm dia on front. Floor - Water proof ply of 1.2 cm in thickness. Put saw dust in it Back - Closed with ply of 1.2 cm in thickness. The ply used should be water proof.</p>
<p>Duck</p>	<p>20 X 50 X 60 For individual duck</p> 	<p>Entrance hole size 12 cm</p>
<p>Sparrow or small birds</p>	<p>75 X 75 X 22</p> <p>The design will be the same which are using for parakeets, only dimensions will be different.</p>	<p>Sufficient for 20-25 sparrow should have enough space for birds to move around. Perch at 50 mm above. Sides - Water proof ply of 9 mm in thickness. Floor - Water proof ply of 12 mm in thickness. Put saw dust. Roof- Water proof ply of 9 mm in thickness. Doors - Sliding on one side. Back side closed. Door made up of 9 mm thick plywood. Ventilation - Wire mesh at rear end at top of the size of 150 X 600 mm.</p>

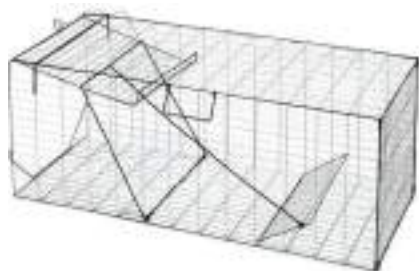
Barn owl or any large bodied owl	40 X 75 X 50 	The design will be the same which are using for any large bodied birds, only dimensions will be different. Entrance hole size must be >15 cm
Hornbill	60 X 90 X 45 The design will be the same which are using for parakeets, only dimensions will be different.	Entrance hole size 15 cm Sides - Water proof plywood of 12 mm in thickness. Roof- Triangle or plain. It should be open able on hinges to clean and inspect the eggs and young. Floor - Plywood of 19 mm in thickness. Back - Closed with ply of 19 mm in thickness. The ply used should be water proof.
Kite, Shikra or similar body sized birds	75 X 45 X 45 The design will be the same which are using for owls, only dimensions will be different.	For one bird, perch at 50 mm, should have enough space to turn around. Sides - Water proof plywood of 9 mm in thickness. Floor - Water proof ply of 12 mm thickness. Put saw dust in it. Roof - Water proof plywood of 9 mm in thickness. Doors- One side with sliding back closed. Door made up of 9 mm thick water proof ply. Ventilation -Wire mesh at the rear end at the top of the size of 150 X 300 mm.

iv) Design of capturing traps

Traps are used to capture problem animals from the human habitations or from problematic areas. The animal shall be captured after obtaining the permission from competent authority. As per Wildlife (Protection) Act, 1972, Chief Wildlife Warden of State has given authority to give approval for capturing any schedule species. Most of the currently used traps used for small & medium body sized mammals can be divided into six types: foothold traps, body gripping traps, snares, deadfalls, cages, and glue traps. It is suggested to build cages to trap the problematic wild mammals instead of foothold traps and others.

Trapping might lead to stress, pain, or even in some cases death for the animal, depending on the type of trap. So care should be taken while capturing wild animals.



Based on available studies, the design for species specific cage traps and protocols on capturing wild animals in cages are given below. In general, cages are of two type i) Single door cage (Picture 1) & ii) Double door cages (Picture-2).



Picture 1- Single Door cage



Picture 2- Double Door cage

Wild Animals	Trap type & size (Length X width X Height in cm)	Remarks
<p>Fox & Jackal Length – 45-65 cm Height–35-45 cm Weight–5-12 kg</p>	<p>Single door types 120-125X30-35X38-40</p> 	<p>Foxes & Jackals are long- bodied animals, so the trap must be long. Take precautions to eliminate human scent from the trap and the area around the trap. Place bait in a hole dug under the rear of the trap. Cover all sides of the trap with a tarp or other material. Sift dirt onto the bottom of the cage to cover the wire bottom.</p> <p>For baiting- Tainted meat, eggs placed in a nest, marshmallows, cotton balls (they resemble eggs and have eye appeal).</p>
<p>Jungle Cat or any wild cat Length – 55-100 cm Height–55-70 cm Weight–5-15 kg</p>	<p>Single-door type, 80X45X45 Double-door traps should be 106 cm long</p> 	<p>Set the trap in the vicinity of an animal kill or a travel way to and from cover. Use brush or grass on the top and sides of the trap to give the appearance of a natural “cubby” or a recess in a rock outcrop or in brush.</p> <p>Cover the cage bottom with soil.</p> <p>For baiting Poultry or fish or chicken feathers for a sight attractor.</p>

<p>Hares Length – 40-45 cm Height–25-30 cm Weight–1.5-4.5 kg</p>	<p>Single door type, 67 x 23 x 23</p> 	<p>Place the trap near cover where hares feed or rest, or where they gain entry under a fence. Place some bait just outside the trap and spray the inside with apple juice to increase effectiveness. To capture hares For baiting Fresh vegetables in summer; apples, carrots, or bread in winter.</p>
<p>Civets Length – 40-70 cm Height–25-30 cm Weight–3-4 kg</p>	<p>Single-door type, 106 X 10 X 12</p> 	<p>Place the trap where the animal, or evidence of the animal has been seen, or at its den entrance. For baiting Fish-flavored cat food, corn, ripe bananas, bacon, sardines, peanut butter, jelly marshmallows, (resemble eggs and have eye appeal).</p>

4) Steps to Capture & release Wild Animals-

- a) **Set a live trap in a probable location:-** For the vast majority of animals like fox, jungle cat, jackal and civets, standard "boxy" live traps of a suitable size work quite well. These traps resemble a long rectangular box with trap doors at one (or either) end. The animal, lured in by bait, steps on a pedal, which releases the trap door(s) and locks it in. All cages need to be perfectly camouflaged so the animal may not detract.
- b) **Bait the trap:-** Set your trap in the "open" position and carefully place your bait in the designated space in the center. You have a wide variety of options when it comes to picking your bait — for instance, you may want to use pork, "wet" cat food, fish, chicken, or other meat.
- c) **Let the trap sit out overnight:-** Though it's possible to see animals at almost any time of the day, our study revealed the animals are usually nocturnal predators. For this reason, once you set a trap, you'll want to be very patient, waiting at least one night for results. Check on your trap in the morning to see if you've caught any animals or not. Don't let the trap sit out for more than a day or so without checking on it. Doing this can cause a trapped animals to suffer from hunger or exposure.
- d) **Handle all animals with extreme caution:-** Once you've captured a wild animals, you'll want to be very careful about the way you handle it, even if it appears securely confined to its trap.

Carry the trap away from your body, holding it only by a safe handhold that's well out of the fox's reach. Never stick your fingers into the cage, shake the cage, or purposely agitate the animal. Animals caught at live traps are likely to be scared for their lives, which means that they have the potential to lash out and bite or scratch you, even if they appear docile on the surface.

- e) **Release it into the wild:-** One option when you've captured an animal is to take it somewhere far away and let it go free. This method has the benefit of causing no immediate harm to the animal. However, it is important to note that, because most of the animals [especially foxes & jungle cats] are territorial creatures. They will sometimes return to their original location if they have to travel a long way to get there. In addition, because of competition from other predators and differing habitat conditions, there is always a chance that an animal released into the wild away from its home will eventually die anyway. Release nocturnal animals at night and diurnal species during daylight. Point the opening of the trap toward escape cover, so the animal can see and move toward it. Stand at the opposite end of the trap, open the door, and tap the trap with your foot. If the animal is reluctant to leave, try placing the open trap on its side and moving away from the trap.
- f) **Post release precaution-** Animal after release need to be monitored if possible through direct observation or through camera trap. Trap that contained a sick animal should be washed, disinfected with a bleach solution (1 part bleach to 9 parts of water and let it remain on for 20 minutes), and thoroughly rinsed after each capture so as to stop the spread of any potential disease.

Design of nest boxes for Birds

Nest boxes are an important aspect to wildlife conservation in any areas where natural nesting hollows are not available. Before preparing and placing any nest boxes, we need to consider following parameters.

1. Building or Selecting a Nesting Box

Although most birds prefer natural cavities for nesting, with the correct design a nesting box can serve as a good replacement. There are numerous types of bird nesting boxes available as per size and shape of bird species. Each box should contain different features and size as per the requirement of particular bird species. There are several features to consider when building a nesting box. Check that the box is well constructed and contains these basic features:

- i. Constructed of natural untreated wood
- ii. Lumber for walls that is at least $\frac{3}{4}$ of an inch thick to provide insulation
- iii. An entrance hole of the appropriate size to allow desired birds to enter but keep larger birds out
- iv. An entrance that is the correct distance from the floor to accommodate the nest
- v. An extended and sloped roof to keep the rain out
- vi. A recessed floor and drainage holes to keep the interior dry
- vii. Rough or grooved interior walls to help fledglings exit
- viii. Ventilation holes to allow the interior to remain cool
- ix. A side or top panel that opens to allow easy access for monitoring and cleaning
- x. No outside perches, which aid predators and other harassing birds
- xi. It is also important to make sure that box incorporates features preferred by the particular bird species you hope to attract. These features include the entrance-hole size, the height at which the box is posted, and the type of habitat surrounding the box.

2. Placement of Nesting Box

The available habitat will be the primary factor determining the type of birds to be attracted for nesting. Here are a few things to be considered:

- i. Make sure that to place birdhouses in a location where the target bird species is likely to reside. Before placing the nest boxes the height and direction preferences should be as per the need of the species.
- ii. Avoid putting nesting boxes in areas where herbicides and pesticides are used. Not only do these chemicals decrease insect populations--the primary food source for most cavity-nesting birds--but they can also harm birds directly.

- iii. The box can be mounted on a tree or a pole. Placing the box on a pole with a predator baffle to protect the birds is often more successful. Make sure that the box is attached securely enough to withstand severe weather and winds.
- iv. Take into consideration the direction of the box is facing and how much direct sun it receives. For example, birds may reject boxes that face west direction, because the box may stay too hot.

3. Monitoring and Cleaning of Nesting Box

Once breeding season begins, monitor the box for activity. Adults quickly dart in and out as they build their nests or feed hungry nestlings.

Once eggs have been laid monitor the progress of the nest. Lightly tap on the box before opening the panel to allow the adult bird to leave. So as not to become a nuisance, limit the viewing time to less than a minute once a week. Keep track of the progress of the nestlings. This way once they have fledged and the box is no longer in use it can be cleaned. Some birds will not use cavities with abandoned nests in them, and removing the debris cuts down on ecto-parasites for the next set of nestlings

4. Species specific birds nest box

4.1 Large Owl Nest Box



Materials: Moisture proof plywood

Construction: Panels stapled together with surface sunk staples. Key panel joints silicon sealed to reduce water ingress

Finish: Non-toxic water based stain and preservative

Dimensions: Overall height: 74cm, Overall width: 59cm, Overall Depth: 50cm, Depth of enclosed box: 34cm, Volume: 0.09 m³

Weight: 5-8 kg

Fixing: Fixing holes in panel extensions

4.2 Medium body sized Raptors (Eg Shikra, Besra etc but not for vultures)



Material Moisture proof plywood

Construction Panels stapled together with surface sunk staples.

Finish Non-toxic water based stain and preservative

Dimensions Overall height: 52cm, Overall width: 21cm, Overall Depth: 19cm

Weight 3.0kg

Fixing 2 mounting holes at top of back panel

4.3.Sparrow or other small birds



Material: Moisture proof plywood

Construction: Panels stapled together with surface sunk staples. Slide out floor.

Finish: Non-toxic water based stain and preservative

Dimensions: Overall height: 24cm, Overall width: 39cm, Overall Depth: 17cm

Weight 2- 2.5 kg

Fixing Keyhole at back of each nest unit

4.4.Duck Nest boxes



These attractive hand-woven duck baskets provide shelter and a safe nesting site for ducks and moorhens. Simply place at the water's edge in dense vegetation above the flood level. If suitable vegetation is unavailable the baskets can be secured a meter above water level with strong branches or posts.

Material: Cane or bamboo

Width: 320mm

Depth: 900mm

Weight: 2kg approx.

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