Guideline on Handling Greater One-Horned Rhinoceros Carcass in India

Ministry of Environment, Forest and Climate Change
February 2021

Handling Greater One-Horned Rhinoceros *(Rhinoceros unicornis)* Carcass in India

Guideline

Suggested citation: SOP (2021) Standard operating Procedure for handling Greater One-Horned Rhinoceros *(Rhinoceros unicornis)* carcass in India. Published by Ministry of Environment Forests and Climate change.

Acknowledgements: Shri Soumitra Dasgupta, Shri Mahendra. K. Yadava, Shri Amit Sharma, Dr Parikshit Kakati, Dr Apurba Chakraborty, Dr R. Gopinath, Shri Ujjal Ghosh, Shri P. Sivakumar, Shri Bhupen Talukdar, Shri S.K. Seal Sarma, Shri Ramesh Gogoi, Shri Sandeep Bendi, Shri Pankaj Sharma, Shri Ritu Paban Borah, Shri Mukul Tamuli, Shri Salim Ahmed, Dr Samrat Mondol, Dr L. Kawlni, Dr Saket Badola, Dr Rathin Barman, Dr Bhaskar Choudhury, Dr Deba Dutta, Dr Joydeep Bose, Dr Dipankar Ghose, Dr Bibhab Talukdar, Dr Sonali Ghosh, Dr Gowri Mallapur and Ms Pallabi Chakraborty

Background

The world's largest population of Greater One Horned Rhinoceros (Rhinoceros unicornis) is found in India. Although confined to a few pockets of Terai grassland habitat in Protected Areas of Assam, West Bengal and Uttar Pradesh, the increase in its numbers in a span of less than a century has been a remarkable conservation success story. Poaching for illegal trade in rhino horn has declined in the past few years and the laudable conservation efforts have resulted in upgrading its current conservation status to 'vulnerable' on the IUCN Red Data list.

Given the need to combat poaching and any further illegal trade in rhino horn and body parts, there has been a felt need to come up with a Standard Operating Protocol (SOP) for the safe disposal of Rhino carcass in its in-situ conditions. The SOP is aimed at safe handling for handling and investigating rhino deaths in India. The SOP provides the basic, minimum steps which are required to be taken at the field level (PA or elsewhere) for dealing with incidents of rhino mortality where the carcass is available or the body parts have been seized.

Objective: To establish a scientific protocol for undertaking uniform investigation to ascertain the causes of rhino mortality and the disposal of carcass.

Scope: The SOP is aimed as a ready reckoner for the forest frontline , police personnel and the veterinary teams deputed in therhino range areas of India.

Constitution of Field Level Teams

A. Responsibilities: The Field Director / In-charge of the Rhino bearing Protected Area would be overall responsible for implementing the SOP. 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.

B. Constitution of Crime Investigation Team (CIT): Range-based crime investigation team as notified under WCCB and RhoDIS guidelines.

C. Constitution of Post Mortem Team (PMT): Every rhino mortality within the Protected Area network may be investigated by a pre-constituted Post Mortem Team, with all necessary equipment and logistics to carry out the necropsy of the carcass.

The PM team may have the following personnel:

a. One veterinarian from the Government service experienced in conducting PM of rhinos or large herbivores.

b. A second veterinarian / Veterinary field assistant.

c. A Forest Range officer / Forester-II of

the concerned range.

d. At least four experienced forest staff (to provide support in the conduct of the PM and also keep the team secured during the conduct of procedures).

e. One representative from a civil society organization/ NGO.

f. Representative of the Superintendent of Police of the concerned district and not below the rank of a Police Inspector in case of suspected crime cases.

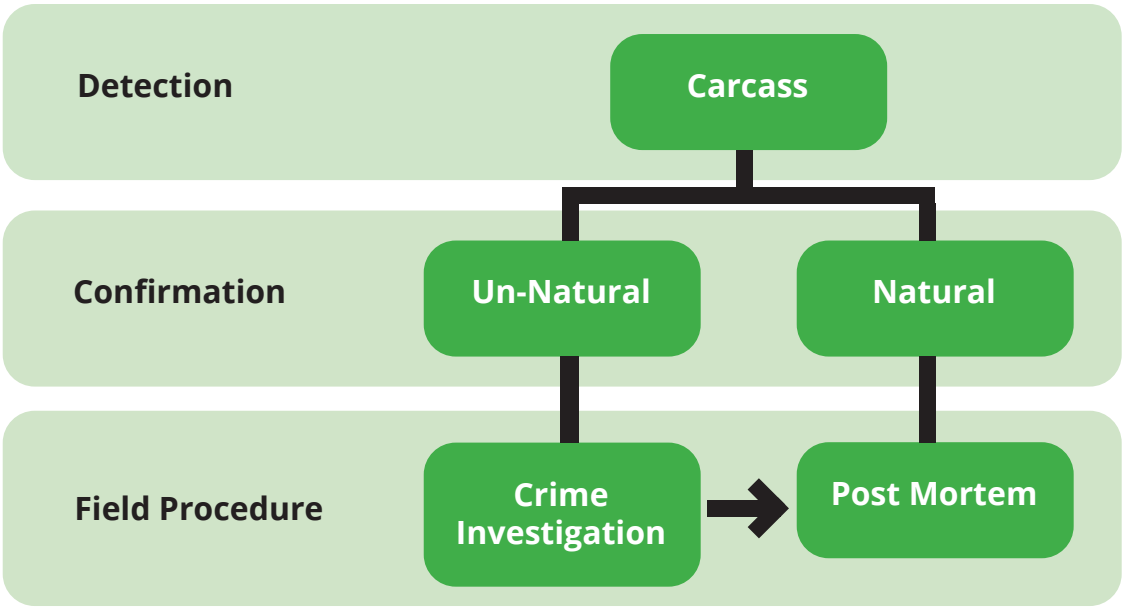

Fig. 1 - Flow of Actions

Procedural Steps

Preliminary Examination

1) On detection of a dead rhino carcass, the same may be immediately communicated to the Field Director / PA incharge . GPS location and site photos may be taken as feasible. The CIT and PMT can be deputed to the spot immediately.

2) The cause of death may first be ascertained from a distance, without actually touching the carcass.If the case is suspected to be a crime / poaching, the potential zone of influence / crime scene must be cordoned off for all outsiders so that evidence is not disturbed.

3) The K9 Dog Unit (if available), should be immediately deputed to follow up on the fresh tracks as available for follow-up.

4) If the crime scene is outside the jurisdiction of a Protected Area, the nearest police station may be informed by the CIT and requested to provide support in the investigation. Further, the Field Director / PA -Incharge may authorize the PMT to be deputed to the area outside the jurisdiction in collaboration with the district authorities.

5) The entire investigation process must be video recorded and adequately photographed for complete documentation of the procedures as per WCCB guidelines.

6) The investigation team will carry out the investigation (including preservation of the crime scene, documentation, evidence collection, packaging, etc.) conforming to the guidelines under the Wildlife Protection Act, 1972 and as prescribed by WCCB.

7) The carcass should be inspected for position, wounds, bleeding, external indicators for cause of the death etc. Presence of blood spoor should be noted which may indicate direction animal had run before dying. Back tracking should be done for clues.

8) Metal detector must be used to look for bullets and other clues.If the carcass needs to be opened to retrieve any bullet or any other evidence, the investigation team will take the help of the PM team.

9) The crime investigation team with assistance from the PM team who will conduct the PM will collect the appropriate sample for forensics analysis and DNA investigation.

10) The investigation team will complete the site investigation procedures and complete the legal procedures of registering the wildlife offence report and filing of the complaint.

Sample Collection

1) During the conduct of PM of naturally occurring deaths, appropriate samples should be obtained from every rhino carcass and dispatched to the RhoDIS laboratory at the Wildlife Forensics and Conservation Genetics Cell, Wildlife Institute of India as per the existing RhoDIS SOP for recording the DNA and adding to the RhoDIS database.

2) The horn from every rhino carcass should be appropriately collected, processed,photographed (preferably with a reference scale), measured (weights at the time of collection, immediately after boiling after drying, at the time of packaging, internal and external length and base circumference).

3) The processed horn should be packaged and deposited with the Range Officer for storage with a serial number, date and place of collection (with GPS location), PM reference number, and collector's name. For a crime case, the case number, RhoDIS kit number, forensic samples dispatch details and investigation officer's name also should be included. The deposited horn should be securely dispatched to the DFO or the identified storage cell with all the recorded details and forwarding. These records should be also maintained in a secured digital database maintained at the range HQ, park HQ and the CWLW of the State.

4) In case the horn of a rhino that died due to natural causes gets disengaged from the carcass and falls off in the surrounding, a water body, stream, swept by swollen waters, gets buried under silt etc., every attempt should be made by the PA manager and staff to recover the horn.If all attempts fail over one year or so, the horn may be declared "missing in the field."

5) The raw horn collected should be first treated in boiling water added with common salt (around 10 g per litre of water) to get completely rid of any tissue matter. Next, it should be taken out of the boiling water, again weighed and open dried, or using a room heating facility,without exposing it to direct heat waves. The dry horn should be recorded for the dry weight, length (anterior and posterior) and base circumference. The storage of the horn should be at 15-200C and about 70-80% RH on open shelves (never on the ground).

6) The Divisional Forest officer of the PA or the forest division where the rhino horns are stored can obtain the approval of the respective Deputy Commissioner/District Magistrate for depositing the rhino horns in the Government Treasury every 12 months. Once approved, the DFO should constitute a committee for certification of authenticity. The members should comprise of:

- **(i)** Representative of the DC/DM,
- **(ii)** Forest officer in the rank of DCF and above,
- **(iii)** SP of the district,
- **(iv)** A rhino expert working, and
- **(v)** Representative of the CWLW of the state

Once certified, the horns should then be packed individually, sealed in a secure container and be dispatched to the Government Treasury. Once the sealed box is verified and received by the Treasury officer an official acknowledgment will be provided for the items received.

7) The movement of Rhino artifacts such as horn or nails or other body parts for storage/ research/ court purposes must have proper auditable paper/computer log trail in secure server system/well-identified desktops/mobilesmartphones with tag readers, barcode readers, and access control systems – all integrated together and linked to the overall RhoDIS. All such artifacts must also be appropriately tagged with “natural” death, “offence”, “seized”, “confiscated”, or any other appropriate category as may be decided by the CWLW of the State.

8) The final decision regarding the preservation / storage or the disposal/ destroying of the rhino horns will be taken by the respective states. In case the rhino horn is to be maintained, a secured and transparent stockpile management system approved by the state needs to be followed.

Diganta Talukdar, Wikimedia commons

Post Mortem & Carcass Examination Guidelines

Personal safety precautions

1) Before the post-mortem examination commences, the circumstances of the illness and death of the animal and the likelihood that the cause may have been a zoonotic or notifiable disease may be ascertained. Personnel conducting necropsy should wear appropriate protective clothing including PPE, gloves, masks, and scrubs. Great care must be taken to ensure that all specimens taken from a carcass are collected. Labelled and stored appropriately based on the further examination warranted and transported safely and appropriately to the designated laboratory, and further that there is no risk of the escape of infective material.

2) Types of rhino carcasses: The following are the field situations under which a rhino carcass is usually presented for PM examination-

i. An adult / sub-adult fresh rhino carcass with horn intact.
ii. A fresh calf carcass.
iii. An adult / sub-adult rhino carcass with horn missing.
iv. A rhino carcass irrespective of age/ sex found floating in a water body with horn intact.
v. A rhino carcass irrespective of age/ sex found floating in a water body with horn missing.
VI. A rhino carcass irrespective of age/ sex found stuck in mud or swamp.
VII. A rhino carcass irrespective of age/ sex found with accumulation of feces or localized heavy browsing of food plants in the proximity which may indicate a period of immobility.
VII. A half-eaten/mutilated rhino calf/juvenile/adult irrespective of age/sex.Any rhino carcass irrespective of age / sex with multiple injuries over the body and horn intact/yet to develop/broken/ missing.
VIII. Suspected parts of a rhino carcass recovered either fresh or decomposed.

All the above situations demand for PM examination at field level (For cases of anthrax and other communicable and notifiable diseases, a separate protocol, procedures and systems may be followed after discussion with the Veterinarian):

i. A rhino carcass irrespective of age/sex found with signs of a struggle, indicating encounter with a predator or a paroxysm at the time of death.
ii. A highly decomposed rhino carcass irrespective of age/ sex with horn intact or fallen off naturally but near the carcass.
iii. A highly decomposed rhino carcass irrespective of age/sex with horn missing.
iv. A suspected rhino skeleton without much information.

v. Any rhino carcass irrespective of age/sex with blood oozing out from the natural orifices and horn intact (suspected case of anthrax and other communicable and notifiable diseases)

Steps during post-mortem examination for Rhino carcasses

1) Death of animal must be confirmed by signs like cessation of respiration, heartbeat, and pupillary and eyelid movement. The requisition letter from the competent authority must be obtained by the veterinarian performing the post-mortem examination. PM examination should be conducted in day light or in case of emergency by adequate lighting of the area, say in any hostile conditions.

2) A provisional/preliminary gross report should be provided by the veterinarian in-charge of the PM after completing the examination of the carcass. The samples collected during the necropsy must be recorded, labelled, dispatched to the respective laboratories to obtain a confirmatory laboratory-based report. The samples must be sent to the laboratories from the office of the FD/DFO of respective PAs along with a copy of the gross PM findings.

3) Subsequently, on receipt of the reports, the veterinarian who performed the PM should compile the final report on the diagnosis and the cause of death.

Steps to be followed for suspected cases of Poaching/ unnatural death

Step 1. External examination: Animal should be examined externally before opening the body for the presence of lesions on body surface. Eyes, ear, anus, vulva, mouth, nares etc. should be specifically examined for the presence of blood and any other lesion. If there is blood at the natural orifices, it should be noted for the presence of anthrax bacilli and such carcasses must not be opened for postmortem examination. Following points should be taken into consideration while conducting external examination.

- Tracks of the animal and blood trails
- Should try to establish the approximate time of death of an animal
- Trauma, wound, fracture, cuts, etc.
- Fungal infection
- Parasitic infestation e.g.mites, lice, ticks
- In which recumbency position the animal was lying on the ground.
- Discharges from openings/orifices.
- Burn, ulcers, erosions etc.

Gunshot wounds, snare wounds and wounds inflicted while removing the horn or during removal of any other body part.

Step 2. Internal examination:

1. The carcass should be positioned on its left side and the left foreleg severed by cutting all the muscular attachments that

hold the leg to the chest wall. The leg is then laid over to lie flat on the ground.

2. The left hind leg is similarly disarticulated by cutting down to the coxo-femoral joint. An incision is now made through the skin from the anus to the chin and the body is skinned back almost to the vertebral column.

3. The entire upper wall of the body cavity is removed by incising along the midline from the xiphoid cartilage to the pubis.
4. From the pubis, the incision is continued almost to the tuber coxa then forward to the origin of the last rib. The ribs are now all severed near their articulations with the vertebrae using an axe or a bone saw.

5. Next, the ribs are severed along their sternal ends from the thoracic inlet to the last rib. The incision is carried back until it joins the original incision at the xiphoid cartilage. Beginning at the rear, the severed body wall should be lifted clear of the carcass, and the underlying attachments cut, including the diaphragm.

6. A saw should be used to cut through the pelvis, thereby exposing the pelvic organs. The viscera are now exposed and can be examined.

7. The complete tissue and blood samples are to be collected from carcasses as per checklist provided as far as possible (Annexure-X) for necessary investigation in the concerned laboratories.

Step 3. Examination of Subcutaneous tissue and musculature: The subcutaneous tissue and musculature should be examined after removal of skin for the presence of lesions such as:

- Congestion, hemorrhage,anemia, icterus
- edema, nodules, tumors.
- Fat deposits
- Necrosis on muscles, hardening, calcification.

Step 4. Examination of Abdominal and thoracic cavity: Just after opening the carcass, one should observe the presence of any lesion in abdominal and thoracic cavity and following points must be kept in mind.

- Displacement of organs.
- Accumulation of fluid (serum, serosanguinous fluid, blood, pus etc.)
- Fibrinous or fibrous adhesions.
- Parasites
- Abscess, tumor etc.

Step 5. Examination of Respiratory system:

Organs/tissues to be examined: nasal passage, larynx, trachea, bronchi, lungs, mediastinal lymph nodes.

Lesions if any to be observed

- Discharge from nostrils.
- Growth (granuloma/polyp) in nasal passage if there is blood mixed

- nasal discharge.
- Trachea and Bronchi- Congestion, hemorrhage, presence of caseous exudate, frothy exudate. Pneumonic lesions, parasites etc.
- Lungs- Congestion, consolidation, nodules, presence of exudate on cut surfaces, edema, atelectasis, emphysema, hemorrhage, and necrosis, parasites
  Mediastinal lymph nodes- Edema, hardening, calcification, congestion, hemorrhage.

Step 6. Examination of Cardiovascular system:

Organs/tissues to be examined: Heart, aorta, arteries, veins and lymphatics
Lesions to be observed

- Fluid, blood, pus, etc. in pericardial sac
- Adhesions, fibrin, fibrosis
- Congestion, hemorrhage, necrotic foci
- Hardening of blood vessel, obstruction, thrombi
- Presence of parasites
- Post-mortem clot/ thrombi

Step 7. Examination of Digestive system:
Organs/tissue to be examined: Mouth cavity, esophagus, stomach, intestine (duodenum, jejunum, ileum, cecum, colon, rectum), anus, liver, pancreas, mesenteric lymph, nodes etc.

Lesions to be observed:

- Erosions, ulcers, vesicles
- Congestion, hemorrhage, edema
- Necrosis
- Icterus
- Abscess/pus
- Intussusception, torsion, volvulus
- Parasites
- Atrophy, hardening, nodules
- Contents, catarrhal, blood mixed, digested/ undigested feed material, thickening of wall of intestines.
- Cut surface of liver for parasites, lesions in bile duct
- Foreign body

Step 8. Examination of Urinary system:

Organs/tissue to be examined: Kidneys, ureter, urinary bladder, urethra

Lesions to be observed:

- Congestion, hemorrhage, infarction, edema
- Necrosis, hardening, nodules
- Deposition of salts, calculi
- Obstruction, pus in pelvis

Step 9. Examination of Genital system:

Organs/tissue:

Female - Ovaries, uterus, cervix, vagina.

Male - Testicles, Epididymis, penis, prepuce

Lesions to be observed:

- Cysts in ovary
- Congestion, hemorrhage, edema
- Foetus in uterus, pus, fluid
- Necrosis, overgrowth, nodules
- Atrophy, adhesions, granularity

Step 10. Examination of Immune system:

Organs/tissue to be examined: Spleen, lymph nodes, bone marrow, Peyer's patches, Gall bladder

Lesions to be observed

- Size, shape, atrophy, hardening.
- Edema, congestion, hemorrhage

Step 11. Examination of Nervous system:

Organs/tissue to be examined: Brain, spinal cord, nerves, meninges

Lesions to be observed

- Congestion, hemorrhage, hematoma
- Edema, swelling
- Abscess
- Hypoplasia

Step 11. Miscellaneous observation:

- Adhesions or fluid in pleural/ peritoneal cavity
- Any other left-over information pertinent to post-mortem examination / diagnosis.

Steps to be followed for suspected cases of anthrax/ anthrax/ other zoonotic disease

1. Inspect for bleeding from natural orifices viz. nose, anus, vulva, eyes, and ears for blood, which could indicate suspected anthrax.

2. To ascertain the cause of death, blood smear should be taken from the ear tips/ oozed blood avoiding surface contamination from the soil and surroundings. The smear should be heat fixed and sent to the laboratory for staining and confirmation of Anthrax bacilli. If smear is not possible, then a piece of the ear (ear tip) in ice should be sent to the laboratory for examination.

3. The site where the animal died should be thoroughly scorched with a down directed flame and/or disinfected with 10% formalin after disposal of the carcass.

General instructions for sample collection:

1) In case of detection of a mutilated carcass, identify the species and assess the age of the carcass and approximate date of death. Signs of predator/intra-species aggression must be observed and noted down properly along with proper photo/ video documentation.

2) Both dry ice and ice packs can be used in sealed containers while transporting samples. Samples can be labelled individually in separate leak-proof

containers.In legal cases, these materials should be sent to State Forensic Laboratory under sealed packaging.

3) In the suspected cases of toxic condition or poisoning, the stomach and intestinal contents should be sent after proper ligation at both the ends in ice to avoid putrefaction. All the materials should be collected in leak-proof glass or plastic bottles. All the containers should be packed with cloth and sealed with sealing wax.

4) Tissues for histopathology must be collected in 10% formalin or formol saline, this can be sent to laboratory under normal temperature.

5) The materials suspected for toxicity should be sent in ice without adding any preservative.

6) The suggested RhoDISgeneral sample collection kit components that may be procured at Division level include the following:

- Zip lock bag (approx. 6 X 8 inch)
- 50ml empty plastic vial for bone / horn sample
- 50 ml plastic vial with 10-15mg salt for tissue sample
- 1 EDTA vial for storage and transport of blood
- 5ml syringe for drawing blood
- Data format

Disposal of Carcass

1) The carcass of a naturally dead rhino should be buried at a depth of at least 6 feet from the surface level in a lateral position. Pit should be sprayed with a layer of common salt and lime powder (at least 20kg each) and other disinfectants in adequate quantities before coveringwith soil.

2) If the carcass is outside the boundary of a rhino bearing area, the carcass may be brought inside a boundary of PA and buried. If the carcass can't be brought within 500 meter inside the boundary area of the rhino bearing area, then it may be buried in a suitably isolated place in presence of forest, police and a magistrate.

3) If the carcass is found within 500 meters from the boundary of a legally defined Protected Area, then the carcass should be buried in presence of forest department.

4) If a rhino dies due to Anthrax/any other infectious disease, whether inside or outside a Protected Areas, the carcassshall be burnt to avoid spread of the disease in the area.

Annexure - 1
List of Equipment required to conduct large animal Post Mortem kit

Sno.	Item	Quantity	Use
1	Large animal necropsy knife straight (10 inch)	02	De-skinning
2	Large animal necropsy knife curved (8inch)	02	De-skinning
3	Large animal necropsy curved (4 inch)	02	Evisceration
4	Large animal necropsy knife straight (6 inch)	02	Evisceration
5	Knife sharpener (stone)	01	Evisceration
6	Bone chopper	01	
7	B.P handle (no 24 and 28)	02 each	Exploration musculature
8	B P Blades for 24 and 28	100	
9	Mayo scissors 23 cm straight	02	Hollow organ exploration
10	Mayo scissors 21 cm curved	02	Hollow organ exploration
11	Mayo scissors 6 inches straight	02	Hollow organ exploration
12	Bone saw with blades (battery operated)	01	Vertebrae
13	Post mortem hammer	01	Cranial exploration
14	Tissue forceps (7 & 3 inches)	02	Sample collection

Sno.	Item	Quantity	Use
15	Rat toothed forceps (7 inches)	02	Sample collection
16	Manual/ battery operated bone drill	01	Exploring cranium and bones
17	Axe with handle (4-5 inches)	01	Cranial exploration
18	Chisel 0.5 and 1 inch	01	Cranial exploration
19	Hacksaw blade	10	Exploring cranium and bones
20	Hacksaw handle	01	Exploring cranium and bones
21	Tool kit box / bag	02	Equipment/ sampling
22	Coveralls (disposable full sleeve) / PPE kits	5	For team handling the carcass
23	Gum boots (Ankle length)	4 pairs	For team handling the carcass
24	Examination gloves (latex)	1 box	For team handling the carcass
25	Masks (for TB suspicion use NIOSH N95 masks)	1 box	For team handling the carcass
26	Face shields disposable	1 box	For team handling the carcass
27	Eye protector (glass)	2 pairs	For team handling the carcass

Annexure - 2

Items for Sample Collection and Preservation

Sno.	Item	Quantity	Use
1	10% formalin	3000 ml	Fixing tissue
2	HiViral Transport Media code: AL 167	50 vials	Collection, storage and transport of suspected samples of viral diseases.
3	Specimen jar	500 ml, 200 ml and 300 ml: 5 each	Sample preservation
4	Absolute Alcohol	500 ml	Sample preservation
5	Silica gel		Sample preservation
6	Culture swabs	100	Bacteriological sample collection
7	Sterile sample container (50 ml)	20 cups	Sample collection
8	Glass slides (grease free)	1 pack	Blood smear and impression smear preparation
9	Serum tubes (5 ml)	100 tubes	Blood/ Urine
10	Aluminium foil (roll)	01	Freezing tissue
11	Plastic Zip lock bags (10x8 inch and 6x4 inches)	100	Freezing tissue
12	Weigh scale (50 kgs sensitive up to 5 gm)	01	Weigh organs
13	Measuring tape (30 m)	01	External morphometry

Sno.	Item	Quantity	Use
15	Labels and Permanent markers (Water and alcohol proof)	4	Labelling of samples
16	Ice box/ thermos flask	1 (14 litres)	Sample dispatch
17	Camera (Point & shoot)	01	Documentation
18	Ruler (30 cms)	01	Size reference
19	Bio Hazard bags	1 box	Disposal of biohazard
20	3 ton straps & jute ropes	2 nos	Carcass maneuver
21	Styrofoam leak proof containers	01	Sample dispatch
22	Tarpaulin sheet of 6x 6feet	02	Carcass placement & shade
23	EDTA Vials/ Heparin	1 box	Blood collection
24	CLOT Activators	1 box	Serum collection
25	Spirit lamp	01	Aseptically sample collection
26	Disposable sterile syringe and nee-dle(2.5, 10 and 20 ml)	1 box	Collection of biological fluids
27	Vernier calipers	01	Measurement of small specimens

40Sno.	Item	Quantity	Use
28	Common salt	1 kg	Preservation of samples(Toxicological and genetic studies)
29	Hand sanitizer	02	Personal hygiene
30	Green cloth (4x4)	01	Aid in photographic evidence collection
31	Cryo tags (Cryo babies)	1 box	Sample marking
32	Painting brush	01	Picking up small parasites
33	Forzen ice packs	10	Sample preservation
34	Match box/lighter	01	Aid in sample collection
35	Twin/thread roll	01	Tying off hollow organs
36	Magnifying glass	01	Aid in sample collection
37	Spirit lamp	02	Aid in sample collection
38	Absorbent cotton roll	01	Aid in sample collection
39	Filter paper	01	Aid in sample collection
40	Rubber band	01 pkt	Aid in sample collection

Annexure-3

Post-Mortem Format

Post Mortem Format

Serial no: Date :

PART-A

Detailed necropsy findings of a rhino carcass (Rhinoceros unicornis)

Name of PA: Range: Camp/Beat:

Date & day:

GPS (in WGS84) of PM site: Lat (dd.ddddd): Long (dd.ddddd)

Ambient temperature: Humidity: Raining: Y/N

Date and time of carcass detection by forest staff:
Description of carcass site (Immediate surroundings description like topography, water bodies, woodland, grassland, patrolling path etc.):

Any other significant and relevant details:

External examination of the carcass

Carcass description/Cadaver change:

Sex: Approximate age:

Rigor mortis:

Condition of mucous membranes of:

Eyes: Oral cavity: Nasal cavity: Genital tract:

Rectum/anus:

Condition of:

Eyes: Ears: Tail: Horn:

Teeth: Superficial lymph nodes: Vulva:

Morphometry (All length in cm):

Length from tip of upper lip to base of tail:
Height at withers:
Chest girth:
Neck girth:
Approximate weight:
Tail length:
Circumference of foot pads:
Right fore: **Left fore:**
Right hind: **Left hind:**
Incisor teeth length and condition:
Horn circumference at base:
Horn length:

Internal examination

Subcutaneous tissues and muscles:
Alimentary system/Digestive system:
Buccal cavity:
Tongue:
Pharynx:
Oesophagus:
Abdominal cavity:
Peritoneum:
Liver (Appearance, size, colour, edges, consistency):
Portal ducts, veins and arteries:
Omentum& mesentery:
Stomach (Mucosal and serosal surfaces, content, lesions, tumours, parasites etc.):
Small intestine (Duodenum, jejunum & ileum/ Mucosal and serosal surfaces, content, lesions, tumours, parasites etc.):
Large intestine (Caecum, colon & rectum/ Mucosal and serosal surfaces, content, lesions, tumours, parasites etc.):
Lymph glands:

Respiratory system:
Nasal cavity:
Larynx
Trachea:
Diaphragm:
Thoracic cavity:
Position of visceral organs:
Presence of fluids (Ascitic, exudates, pus, blood, serosanguinous fluid etc.):
Pleura:
Bronchi and bronchioles:
Lungs:
Lymph nodes:

Circulatory system:

Pericardial sac:
Heart muscle:
Heart vessels:
Heart chambers:
Thoracic blood vessels:
Spleen (Appearance, size, colour, edges, consistency):
Lymph glands:

Urogenital system:
Kidneys (Capsule, appearance, size, colour, consistency, cortex, medulla, haemorrhages etc.):
Ureters:
Urinary bladder (Serosal and mucosal surfaces, contents, haemorrhages, perforation etc.):
Urethra:

Male:
Testes & associated structures: Penis: Prepuce:

Female:
Ovary: Uterus: Cervix:
Vagina/vulva:

Nervous system:
Meninges:
Blood vessels:
Brain:
Spinal cord:
G. Skeletal system:
Major bones:
Vertebral column:

Summary of major findings (In bullet form)
List of samples collected, dispatched and address of referral laboratories

S.No	Sample collected	Preservative used	Requested test	Laboratory

Provisional diagnosis: Date:
Post mortem performed by (name, designation & signature):
1.
2.

Team members (with signature) :

PART-B
Final diagnosis report

Serial no: **Date:**

Name of PA: **Range:** **Camp/Beat:**
Sex: **Approximate age:**
Provisional Pm report reference and date:

Date of necropsy:
Date of dispatch of post mortem samples to respective laboratories:
Date of receipt of laboratory reports from respective laboratories:

Laboratory reports summary:
1. **Bacteriology:**
2. **Virology:**
3. **Parasitology:**
4. **Histopathology:**
5. **Mycology:**
6. **Toxicology:**
7. **RhoDIS**
8. **Others:**

Final diagnosis/Cause of death:

Veterinarian's name:
Designation & address:
Signature:
Date:

Annexure-4
Checklist for sample collection during Post Mortem

Type of Sample	Post-Mortem Examination					
	ELISA, (samples in Ice)	PCR, (samples in Ice)	Histopathology (Tissue in 10% Formalin)	Microbial Isolation (Sample in Ice)	Parasitology (70 % alcohol/10 % formalin)	Toxicology (Saturated salt solution)
Heart blood						
Piece of heart						
Tonsil						
Lymph node						
Stomach content						
Piece of stomach						
Spleen						
Liver						
Lung						
Kidney						
Small intestine						
Large Intestine						
Urinary bladder						
Rib bone						
Femur bone						
Blood smear						
Pus						
Skin						
Ascitic fluid						
Brain						
Whole blood						
CSF						
Serum						
Nasal Swab						
Ocular swab						
Oral swab						
Genital swab						
Rectal swab						
Faecal sample						
Skin biopsy						
Wound swab						
Any other sample						

Annexure-5

GoH Rhino Horn Collection format for PM team/ Range Office

GoH Rhino Horn Preservation format for Division / Director Office

Horn ID:
Horn reference number (for range): can be in the form Range/PA or Forest Div./ serial no/month year
Name of PA: **Range:** **Camp/Beat:**

PM reference no. & date -
Date of receipt at Division / Director Office (dd/mm/yyyy):
Horn received from:
Horn received on (dd/mm/yyyy):
Range horn format reference (Form no.):
Is the horn properly packaged and labelled:
Horn custodian at office:
Horn record digital reference: (file name/HDD name/Computer name)

Horn morphometry at Preservation office:
(All measurements in control conditions)
Circumference at base (cm):
Length from tip to base (Anterior in cm):
Length from tip to base (Posterior in cm):
Horn weight (immediately after boiling) in gram:
Horn weight (complete dry) in gram:
Horn weight (at time of packaging) in gram:

(Final photographs in control condition)
Fixation of ID:
RF Tag/Microchip/Bar Code/Others:
UV Code:
QD-Nano Code:

RhoDIS Reference Code:

Signed by the Preservation Officer/ i/c Rhino Horn Storage Facility

Certified by Director or Divisional Forest Officer with official seal, sign and date:

Annexure-7

Suggested format for maintaining PM records in official register and digital database

Sno.	PM Serial no.	Date of PM	Range	Camp	Provisional Diagnosis	Samples Collected (Each sample sent shall be recorded in seperate rows)	Sample sent to lab (Each reference shall be recorded in seperate rows)	Report received from Lab (Each reference shall be recorded in seperate rows)	Confirmatory diagnosis reference (To be interpreted and compiled by the veterinarian doing the PM	Summary of confirmatory diagnosis by the veterinarian	PM entry done by (Name & Signature

Ministry of Environment, Forest and Climate Change