

## **Morphometric Analysis of Pugmarks and Faeces of Captive Inmates - A Field Reference Manual**

A survey conducted by the World Association of Zoos and Aquariums, in collaboration with national and regional zoo and aquarium associations, showed that annually more than 700 million people visit zoos and aquariums worldwide and thus, potentially exposed to environmental education. Therefore, the world zoo and aquarium community has the potential to play an important role in both [environmental education](#) and [wildlife conservation](#). In view the Central Zoo Authority has decided to develop the above manual for using reference by the zoo staff, biologist, zoo managers and zoo visitors and stakeholders. It shall also be used by the zoo as interpretation/education material.

### **Objectives**

1. Morphological studies of pugmarks and faecal samples by the identification of shape, size, colour and texture
2. Morphometric analysis of pugmarks and faecal samples by the measurement of length, breath and diameter

### **Study Site**

The project is undertaken by the Central Zoo Authority so the site for proposed study has been identified as the National Zoological Park, Delhi. However, all the species proposed for the study (like Snow leopard & Clouded leopard etc.) are not housed/ available at the National Zoological Park, Delhi and other zoological Parks as per availability of the species.

### **Selected Animals**

#### ***Carnivores:***

- a) Large cats (Lion, Tiger, Leopard, Snow leopard, Clouded leopard)
- b) Small cats found in India

#### ***Herbivores:***

#### **Deer & Antelope Species**

- a) Manipur Brow-antlered deer
- b) Sambar deer
- c) Spotted deer
- d) Sikka deer
- e) Barking deer
- f) Hog deer
- g) Swamp deer
- h) Chital
- i) Blue bull
- j) Blackbuck
- k) Indian Gazelle

## Materials & Methods

- A) Collection of pugmarks shall be done by pug impression pads. For tracing the impression, 25 cms × 20 cms with 2cm broad graphic printing frame should be adjusted with the corner screw by drawing outline of the pugs/hoooves. Data required for the analysis purpose shall be recorded by measuring the pugmark length and breadth. Preparation of a plaster cast can be done by encircling pugmark with aluminium strip, then by gently putting plaster of paris inside it. The dry and harden plaster cast can help in the age and sex wise identification of individual inside the captivity.
- B) Fresh faecal samples of selected captive individuals will be collected from the respective enclosures and make them to dry naturally. Colour and texture of the freshly collected faeces shall be examined and the measurement regarding length, breath and diameter of the same shall be done by Vernier calliper.

## Expected Outcome

1. The manual will be used as a tool to spread awareness about the biodiversity and its conservation.
2. Serve as educational and interpretation material among the visitors of the zoo.
3. The manual will also serves as a reference guide for the zoo keepers, researchers and biologists and other stakeholders.

## Financial requirements:

(Amount in lakh Rs.)

Sl.	Item	Proposed amount	Justification
A.	Honorarium to 2 research personnel @ Rs. 20,000 per month for 3 month	1.20	
B.	Travel and boarding & lodging cost to collect sample	1.00	Visits have to make to other zoo to collect the samples of animals not available in National Zoological Park, New Delhi.
C.	Material and Consumable	1.00	Required for collecting the sample and analysis. List is provided below
D.	Printing of 500 copies of the manual	0.70	Copies required for distribution to all recognized zoo and stakeholders.
<b>Total</b>		<b>3.90</b>	

## List of the Material and Consumable:

1.	Pugmarks identification and morphometric analysis	Graphic printing frame (25cms × 20cms with 2cm broad)
		Plaster of Paris
		Mug (500 ml)
		Sketch pen/ Marker
		2 m long measuring tape
		Water bottle 2 litres)
		Sieve
		Spade
		Geometry box
2.	Faecal sample identification and morphometric analysis	Camera
		Apron
		Gloves
		Boots
		Vernier Calliper
		Plastic tray
		Petri dish
		Blotting paper
		Glue
		Brush
		Zip lock plastic bags
		Nameplates
		Standard colour chart