

Research Proposal

STUDY ON UTILIZATION PATTERN OF ENCLOSURES BY SLOTH BEAR AND ENRICHMENT REQUIREMENTS IN NON-CONVENTIONAL CAPTIVITY

1. GENERAL INFORMATION

Date of application: **1st March 2011**

Name of the Zoo / organization: **Wildlife SOS (WSOS), D-210, Defense Colony, New Delhi**

Contact person/ project leader: **Dr. Ilayaraja.S, Senior Veterinary Officer - Wildlife SOS**

2. CLASSIFICATION OF PROPOSAL

Improvement of the Zoo ✓	Scientific Management ✓	Ex-situ Conservation	Welfare animals ✓	of the	Any other, please specify
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3. DATE OF INITIATION OF THE PROJECT

1st May 2011

4. DURATION OF THE PROJECT:

2 years

5. LOCATION OF THE PROJECT.

Region /State : Sloth Bear Rescue Centre, Agra, Uttar Pradesh, India

Closest main city **Agra**

6. STAFF INVOLVED IN PROJECT:

Field research Wildlife Biologist - Mr Baiju Raj
Research Officers will be recruited for the project.

7. PROJECT PROPOSAL

7a. Introduction

The sloth bear (*Ursus ursinus*) is vulnerable species as identified in Red Data list of IUCN (2009) and belong to the Schedule I of the Wild Life (Protection), Act 1972. However, due to endemic distribution of the species, it is a commonly housed in Indian zoos. The nomadic

Kalandar gypsy communities across India have in the past traditionally been buying sloth bears from tribals / adivasis who capture sloth bear cubs and train them using cruel methods for purpose of public and tourist performance to earn a livelihood. Due to ban on performance of bears imposed by the Government of India, most sloth bears have been rescued by the State Forest Departments in collaboration with Wildlife SOS from the Kalandar community. Wildlife SOS provided rehabilitation support to the Kalandar communities to assist them with alternative livelihoods so that the persons would not return to this illegal trade. These bears are now housed in various Bear Rescue Centres established by Wildlife SOS with specialised facilities for providing extensive veterinary care for the Bears at Agra, Bannerghatta - Bangalore, Van Vihar Zoo Bhopal and Rescue Center Purulia, West Bengal. More than 500 sloth bears have been rescued till date. Due to trade of sloth bear for bear bile used for Chinese traditional medicine, bear cubs are still being seized by the various State Forest Departments across India from poachers and housed in the rescue centre run by the Wildlife SOS.

The sloth bears in most zoos are housed in moated enclosure for display to visitors. For the first time Wildlife SOS introduced the use of Solar Power Fencing as an effective active psychological barrier to house the sloth bears in separate enclosures instead of using conventional moat or closed structure. Study on utilization pattern of these enclosures by sloth bears where solar power fencing is used as barrier would be a first in India and would provide valuable guidelines for designing of such enclosures and housing requirement for the species. Provision of Environmental Enrichment (EE) to the captive sloth bears is also vital for maintaining physical and mental health and well being of the animals in captivity. The study will be conducted at Agra Bear Rescue Facility (ABRF), located at Agra, Uttar Pradesh, India, the facility established by Wildlife SOS, which houses the largest number of captive sloth bears in the world (over 270). Providing surroundings that stimulate a greater range of natural behaviour and less stress is an essential requirement for optimising the health for these captive bears. The study also aims to decide the best enrichment technique that can routinely be used and widely applied.

These bears will be able to take advantage of the surrounding environment that bring the animals closer to their natural environment, habitat thereby creating adequate stimuli to help gradually reduce and phase out stereotypic behaviour that is typical of elongated captivity. In view of ensuring well being of the animals, it is required to study the space utilization pattern in the enclosures, behaviour of animals and apply enrichment techniques including providing enrichment devices to animals. Behavioural observation is considered as the most basic tool used to evaluate the space utilization and enrichment techniques. Environmental enrichment in the enclosure is known to effectively reduce the auto-aggression or self directed behaviour. Some of the health related concerns associated with the bears in ABRF will be studied through careful provision of the Environment Enrichment.

7b. Main problem or question (max 200 words)

Study of sloth bear in non-conventional enclosures having power fencing as barrier and its enrichment requirement and their utility in sloth bear management would be main question of research. This study will become more important especially when bears which are rescued or surrendered and suffer from physical and psychological stress; therefore, provision of environmental enrichment (EE) would be an important tool to reduce the trauma and stereotypical behaviour and ensure the well being of these captive animals. The animals, while in the hands of the Kalandars, were forced to perform in public, and were housed in extremely constrained spaces at the house of the Kalandar family. The prolonged suppression of the bears from its natural environment has also lead to the development of various kind of psychological stress to the animals. Animals show stereotypic behaviour which need to be addressed by providing the better surrounding that resembles its natural environment.

7c. Aims and objectives of the project (max 200 words)

1. Utilization pattern of Solar Power Fenced Enclosures by sloth bear.
2. Developing new enrichment techniques for wider application.
3. Impact of the various enrichment techniques on the behaviour of the sloth bears.
4. Housing requirement and pattern of housing preference for sloth bear in captivity.

7d Methodology and/or proposed activities (max 300)

Objective 1.

Do captive sloth bears have individual preference to certain specific spots or locations in their enclosures? Do external factors like human disturbance and ecological factors such as bright sun light or soil structure have any impact on the spatial selection and utilization of space in the captivity? Do other bears of the group also influence the utilization of any individual bear? To find the answers, five separate enclosures will be selected at Agra sloth bear rescue centre to assess the utilization pattern and will be divided into grids to study the space utilization. Scan sampling will be carried out at intervals of five minutes and behavioural parameters such as animal location and animal activity (resting, playing, fighting, repetitive pacing, climbing, continuous rubbing, drinking, digging, vocalisation, licking its paws, or other body parts, eating, growling, etc.) will be recorded in pre-designed formats. Study will be conducted in such manner that all the selected enclosures and different periods of the days are covered. Analyses of results will help detect the various factors that influence the utilization of specific areas of enclosures.

Objective 2.

The best methods and techniques of Environmental Enrichment and the tools and devices used that optimises the activity of the sloth bears, which will ultimately reduce the stress and help improve the health will be selected. Various material and combinations will be used to identify and develop the Enrichment devices which may be made up of different kind of woods, barrels, food items, combination of various food items, resting platforms, fruit scent sprays, different kind of artefacts and use of water. The non feeding enrichment may includes objects to play, olfactory materials, training to get immersed in activity, area rotation within enclosure, major exhibit change (shelter structures like caves etc, live vegetation, climbing structures, branches, elevated perches), water source, loose substrate (digging, resting), other permanent movable furnishings, other unmovable permanent furnishings and increase in enclosure area / size will be adopted for sloth bear. For feeding enrichment measures like designed to increase search time (e.g. scatter or hide), designed to increase capture time (e.g. live prey such as ants and termites), designed to increase extraction time (e.g. puzzle feeder), designed to increase processing time related to handling and mastication (e.g. vegetation/browse, ice blocks with food, whole food), designed to increase temporal variability of feeding times (change from feeding at set times) and designed to increase number of feeding times in a day; will be adopted. The comprehensive list of enrichment will be prepared. Animal activeness towards these items will be perceived as stimulating environment. During the study, amount of food given & consumed and time utilized will be noted down to assess the acceptance of new items by bear. Bear are assumed to have different preference level over enrichment and will be graded into points system of 1 to 4. 1 would show less and 4 would highest preference to the given object. Experiment with different enrichment devices will be subjected to sloth bear of all age structure and sex.

Objective 3

Comparative study of bears will be done to assess the impact of enrichment devices on bear biology and behaviour. Impact of enrichment devices on bears within an enclosure will be compared with those enclosures without enrichment devices. Five selected enclosures (Model Enclosure) will not have any additional measures of enrichment devices whereas five enclosures will be used as Experimental enclosure for rigorous experiment to study the impact and carry out a comparison. Various behaviour types of the bears (like resting, playing, repetitive pacing, climbing, continuous rubbing, drinking, digging, licking its paws or other body parts, eating, growling, etc.) and their relation with enrichment measures will be recorded. Behaviour exhibited by the bears will also be grouped into desirable and undesirable. The sloth bears will be regularly monitored in Both Model and Experimental enclosure during the same period on alternate day at 5 minutes interval for 2 hours each between 6:00-8:00, 11:00-13:00 and 16:00-18:00. Analysis will be further attempted to establish any association between animal's behaviour and enrichment provided.

Objective 4

Sufficient data will be gathered in the methodology as mentioned in 1 to 3 and used to assess the housing requirement of sloth bear in captivity. Requirement and utilization of night shelter, size of enclosure, food preference and response to enrichment devices will be key factor to understand the housing requirement. During the study enclosure size, night area design and size, barrier, enrichment devices and basic requisite including landscape of sloth bear will be assessed.

8. COLLABORATION (IF ANY): Please specify with which institutions/organisations will collaboration take place and type of the collaboration & support should also be indicated.

Forest Department of Uttar Pradesh would be main collaborator in conducting the study. However, Wildlife Institute of India and Sloth bear Expert Team and Captive bear Team of Bear Specialist Group of SSC and IUCN will also be consulted for technical inputs to achieve the objective of the study.

8a. Support from host zoo: (Please specify what support the host zoo will be providing, it could be in the form of laboratory, equipment, space or personnel).

Agra Bear Rescue Facility (ABRF), Agra will be available for the study. Veterinarian, Wildlife professionals, Animal keepers, Laboratory, and the land will be available for the study.

10. OUTPUT

10a. Describe which output can be expected from this project (reports, (scientific) publications, management plans, educational tools, etc. etc.) and how they will be disseminated.

The project will come out with following output:

- a) Study will come out with the results on utilization pattern of enclosures in the form of least and highest preferred. The results will provide guideline how one should design the enclosures in order to provide best housing and display to the visitors in zoos.
- b) The study will suggest new enrichment devices and their utility in providing best upkeep to the sloth bear in zoos closer towards the wild behaviour. Bringing back these animals towards their wild nature is necessary so they exhibit natural behavior.
- c) The study would provide basic knowledge of sloth bear behaviour in captivity.
- d) The study will suggest all requisite of sloth bear housing including area, shelter, barrier, design, landscaping, etc for the better management of zoos in India.
- e) The study will also suggest how efficient the Solar Power Fencing is as compared to the conventional moated or closed chain link mesh / walled enclosures.
- f) The study will enhance the standard of upkeep of sloth bear at Agra and other facilities and Indian zoos.
- g) This study will help in understanding and reduce stereotypic behaviour in sloth bear and also provide guidelines for other zoos for the same.
- h) Annual progress report and 5 hard copy of final report including the softcopy in PDF format will be provided to CZA. Softcopy of the report may be uploaded on CZA's web for wider dissemination of the information.
- i) The study & findings will be published in reputed national and international journals.

10b. Describe the (practical) relevance of this project for ex-situ conservation and scientific management of animals in general

The sloth bear in the captivity require attention and care in particular to the dancing bears, which are suffering from psychological & health problems and needs urgent care. Proper shelter, food, spacious surrounding would ensure good health and security of the sloth bear. Although sloth bear rescued from Kalanders are not allowed to breed, however, the healthy sloth bears rescued from the poachers can act as source of health and wild gene pool and may be used in conservation breeding at later stage as and when the need arises. Sloth bears like any other big carnivores are under tremendous threat in the wild. The sloth bear species is in a high level of conflict with humans across its distribution range and considered prone to local extermination. The rapid urbanisation and large scale deforestation and quarrying has lead to the rapid decline of big carnivores like tigers, which get extinct from many forests areas, PA's & reserves. In such possible natural catastrophe in near future, preserving gene pools of carnivore species such as sloth bear has a large conservation value.

The outcome mentioned as above will provide guidelines to enhance sloth bear upkeep in the captivity through providing best housing and enrichment devices including feeding which ultimately be strengthened the cause of ex-situ conservation of sloth bear through scientific management.

10c. Describe how results/output will be evaluated (timelines and benchmarks)

The study would commence as soon as the grant is received and data will be collected in pre-designed formats. The Study will be monitored by Wildlife SOS and Consultants (Expert) in the relevant field to achieve the objective of the study. Annual progress report will be submitted after one year or as desired by the CZA. Before printing, draft final report will be submitted to CZA for comments and input. The Study will be completed within the two year period.

11. FEASIBILITY (How well is the execution of the project guaranteed? Possible risks such as logistics, permits, other finances and how are these risks dealt with).

Wildlife SOS runs the Agra Bear Rescue Facility (ABRF) with necessary recognition from the Central Zoo Authority. The facility is run in collaboration with the Uttar Pradesh Forest Department who will also permit the study. The logistic facility is available with the Rescue facility. Therefore, no risk is involved in conducting the study.

12. FINANCIAL ASPECTS (please include budget overview (in Rs.) in an appendix)

Personnel, Activity & Equipments	Cost Calculations (Rs)	Total (Rs)
Salary for 1 Researcher	@ 12000 x 24 months	288000
Salary for 1 Field Assistant	@ 3000 x 24 months	72000
Honorarium to consultants to provide technical assistant and monitoring the study	@ 50,000 x 2 years	100000
Enrichment of bears. (procuring enrichment materials, construction materials for enclosure, modification of existing enclosure designs)	175000	175000
Transportation cost	1200 X 24 months	28800
Report production, Xerox, binding as well as CD copies		24000
	Grand Total	6,87,000

Rs. Six lakh and Eighty Seven Thousand only

12a. Other financial sources applied for and/or guaranteed

Not applicable

13. DECLARATION

The information submitted in this application is true, to the best of my knowledge. Should any significant developments arise after this application is made, I shall notify the Member Secretary, Central Zoo Authority.

SIGNATURE

Director/Curator/
Officer-In-charge of the Zoo
Commissioner/
(Supervisor of the Research)

Research Project Leader

Chief Wildlife Warden/
Municipal

Owner/Zoo Operator

Signature:
Date:

Signature:
Date:

Signature:
Date: