

## **This month-That age: Nov '86 ZOO'S PRINT: Lion Problem at Borivili** **N. B. Bhure\*, K. D. Batwe\*\* and K. P. Rao**

The Lion Safari Park, established in 1976 in the recreational sector of the Sanjay Gandhi National Park, Borivili has proved to be the greatest attraction to visitors. Its natural setting is akin to the Gir Forest and the sighting of a playful pride of lions in it is something to remember.

The 12 hectares site occupied by the park has a gentle slope from north to south. The Park flora includes species such as *Butea monosperma* (Palas), *Dendrocalamus strictus* (Bamboo), *Carissa carandus* (Karwanda), *Diospyros melanoxylon* (Tendu), *Cassia fistula* (Amaltas), *Acacia* spp. etc. One complete boulder-strewn face of the hill is included in the park area. The adjoining green rolling hills of Kanheri catch the eyes of the visitors.

The entire park area is enclosed by a chain link fencing of 1200 meter length and 6 1/2 meter height. The fencing has been made completely lion-proof. The fence is painted with green and thus, camouflaged with the surrounding sylvan setting. The internal road system is aligned such that visitors could be taken reasonably close to the lions. There is a pond to provide water for lions. Visitors often enjoy the playful behaviour of the young cubs near the water pool. The lion houses are kept hidden from the visitor's view. The animals from these houses are released in the main park through secondary big enclosures. The animals are specially trained so as to return to their houses in the evening for dinner. They are again released in the park after morning breakfast.

Four mini buses and one rescue jeep were provided for the use of the visitors. The Park is kept open on all days, including public holidays except Mondays. Entry to the park is allowed only through the mini buses from 9.00 a.m. to 6.00 p.m. Each trip of the bus takes about half an hour and covers nearly five kilometers of to and fro journey. Ticket charges per trip are Rs. 4/- per adult and Rs. 2/-per child. When a visitor travels in the Safari in a caged mini bus, he can see the family of lions in their natural conditions and in their different moods. The animals are seen least bothered about the frequent movements of the mini buses in the park.

The sighting of wild animals in a completely natural condition gives city dwellers a thrilling and memorable experience, which is exactly what is meant to be achieved in the concept of Safari Parks. This method of exhibiting wild animals has been adopted by many countries in Europe, America and Japan. It is called Safari Park on account of its resemblance to the exhilarating wildlife "Safari" in East African countries such as the famous "Serengeti National Park", where visitors can see immense herds of many species of ungulates, elephants, ostriches and prides of lions from their vehicles. The "Safari" style

zoological park in Europe, U.S.A., and Japan resemble this wildlife safari in that they show the visitors a good number of animals in a large, effective landscape close to their natural habitat, but strictly delimited or fenced off. The Forest Development Corporation of Maharashtra Limited has now proposed to establish a zoological Safari park in the most ideally suitable forest area in the vicinity of Barvi dam hardly 90 kms. away from Bombay City.

### **Population dynamics of Borivili Lions**

Persistent efforts were continued since 1973 to procure lions from various zoos in the country and ultimately nine animals were received to start the lion Safari Park on 1st May 1976. In the beginning it was planned to get only pure breed of Asiatic Lions. In spite of repeated requests we could get only one pair of Asiatic lions from Junagadh Zoo of Gujarat State; but the male lion, Navin, aged 13 years could survive only for few months in the park and the lioness Ketki, aged 6 years, could not mix with the other lions and had to be confined in the weather shelter. Later on the lioness Ketki was transferred to Peshawer Park, Pune. The remaining animals in the park were of mixed breed of African and Asiatic lions, out of which only two lions and three lionesses could be released to roam free in the Safari Park. These animals, though from Zoos, were reconditioned to behave like wild animals and trained for conditions prevailing in the park.

Out of the two lions, 'Gurudutta' was the dominant one and could manage to mate with the lionesses of the park. The other lion, 'Raj' could adjust with the old and royal lady of the park, 'Rani' lioness. Gurudutta and his progeny have the predominant Indian Gir trait. Since 1975 to 1979, 29 cubs were born, out of which on 4 cubs could survive. 'Rani' lioness was the only good mother and could nurse her cubs well as such they survived. In the year 1982 the Safari Park was left with only 7 animals (2 males and 5 females), due to mortalities of a few adult animals and due to transfer of those animals which were not mixing with others to other zoos. To circumvent the odd situation, ten more animals were brought from Sangli Zoo in the year 1982, with the main intention of avoiding inbreeding in the Gurudutta pride. The animals of Sangli pride (6 males and 4 females, aged between 2 1/2 years to 3 1/2 years in 1983) were of mixed strain mostly African and this pride never mixed with the Gurudatta Pride. The population of lions started increasing 1982 onwards and by the end of 1984, the park had 33 animals and this number shot up to 50 in the year 1985.

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The sub-adults of hardly three years were found to attain sexual maturity in the park conditions and there was hardly 10 to 12 months interval between the two litters in case of most of the lionesses. The litter size was 2 to 4. It created problems for the management for a variety of reasons:

- i) Available animal houses could house only 16 animals. With the increase in population, two animals had to be kept in each house.
- ii) Due to the congestion of animals in the weather shelter, the prevailing conditions became worse due to dampness in monsoon. Hook worm infection increased and limping movement due to pad ulcers noticed in some animals.
- iii) To avoid further possibility of inbreeding, only all females or males could be displayed.
- iv) Genetically, the animals were hybrid and not in demand outside zoos in the country.
- v) The cost of feeding, medical treatment and maintenance of animals increased and strained the budget, increasing from 44k to 55k per adult.
- vi) In spite of adverse conditions breeding continued and it due to space constraint all young animals were shifted to a distant place at Tumni Pada.
- vii) The captive animals, accustomed to readymade food and habituated to human company could not be released in wild habitat. Moreover there is no natural habitat available for the release of these surplus lions.

The management of the park approached many naturalists, Zoo specialists; other organizations associated with wildlife and concerned Government Institutions to help them to sort out this problem of lionine population boom. The Bombay Natural History Society and the Wildlife Institute of India, Dehradun, helped the management in many ways to sort out this problem.

The following measures adopted by the management in this behalf.

Zoo managements in our country were found to have following discrepancies.

- i) There is no proper breeding programme to minimise loss of genetic variability in the population and to minimise inbreeding depression.
- ii) There is no effort to define an optimal structure for the breeding population.
- iii) There is no systematic culling of surplus animals. Lions of mixed strain and of inbreeding multiply in large numbers in most of the zoos, but there is no demand for such animals.

Therefore, it became necessary to take up birth control measures for the control of lion population in Lion Safari Park, Borivili. Extensive search was made for disposal of surplus animals. Almost all the State Forest Departments in the country were contacted so as to supply these surplus animals to

the needy zoos in their states. The members of the Advisory Committee of the Sanjay Gandhi National Park, Borivili were also deeply concerned with management problem of housing these increasing numbers of animals, hence they also helped in giving wide publicity to this problem in the press. Thus with combined efforts, 35 surplus animals were supplied to other needy zoos and circuses within a couple of months, and now the park has 15 animals. There are some demands still in hand. Every demand case as scrutinized by the Chief Wildlife Warden of the Maharashtra State and after getting his permission the animals were supplied to secure places like Safari Park, zoos and circuses.

#### **Birth Control for Remaining Lions**

The latest birth control measures were adopted for the remaining animals. The dominant male lion Shankar was vasectomised on 3/5/86 with the help of Veterinary Surgeons of Veterinary College, Parel, Bombay. Similarly five lionesses of the park were implanted with hormonal contraceptives, especially brought from U. S. A. for the first time in India. By adopting all possible measures in this behalf as illustrated above, the animals are now in optimum number which can be managed easily by the administration.

#### **Modern Birth Control Measures Undertaken At Lion Safari Park, Borivili**

There are many methods of controlling big cat population in captivity as practised in the Western countries.

1) Euthanasia i.e. mercy killing is routinely used with dying or diseased animals or even for population controls but this concept is not acceptable to the society and it is just unthinkable in our conditions.

2) There are some managerial techniques such as separation of animals at appropriate period of their reproductive cycle. But such isolation is difficult in lions as it is noticed the breeding amongst felines is throughout the year and moreover, this is not possible in case of Safari, where proper animal display values are more. Such mechanical methods are also not feasible frequently due to space restriction and exhibit needs and social behaviour of animals.

#### **Vasectomy Operation of Lion "Shankar"**

Sterilization has proved to be the superior method of curbing cat population in states though it is irreversible and permanently removes the animal from the gene-pool. Moreover it involves a surgical procedure which interferes with internal body working. Vasectomy is a good method for animals like lions of mixed strain and of inbreeding. It may be a routine surgery in the developed countries, but in Indian condition it is difficult because of non-availability of drugs for anesthetizing large animals. The vascular system of lions is very complex and hence an expert doctor is needed to locate the sperm duct (*Vas deferens*).

With the help of Melghat Tiger Project, Paratwada we could procure the drugs required for chemical immobilization of the animals. The veterinary experts from Veterinary College, Bombay together with Dr. Batwe of Sanjay Gandhi National Park, Borivili could successfully vasectomise the lion "Shankar" on 3/5/86 at the veterinary college Bombay.

The animal kept in the treatment cage, was chemically immobilized by injecting chemical drugs Ketamine and Rompun. The space selected for operation was at the base of scrotum on its anterior aspect. A small incision of about one half inch was made after sterilizing the area. The *Vas deferens* was identified, and a small portion of it was taken out and both the cut ends are ligated with silk thread. The procedure was repeated on the other side also. After the operation, the wound was treated with antibiotic powder, and was sutured with no. 1 size cat-gut. During the immobilised stage of the animal the complete physical examination of the animal was taken and necessary required treatment was given. After a few days stay in the veterinary hospital Bombay, "Shankar" was taken back to Lion house in Safari Park, Borivili. Shankar has now completely recovered and selected Chanda lioness in estrus, a queen of his choice from the harem of seven lioness and was seen happily mating with her.

**Contraceptive Implants-first time in India**

Many compounds in western countries are developed as suitable contraceptives and agents for suppression of heat or synchronization of estrus in domestic livestock. These include preparations for regulation of both male and female fertility. Many of these compounds have been tested in domestic animals as well as in laboratory species so that data on primates, rodents, carnivores and ungulates are available. Dr. U. S Seal and others after studies on lions had successful results with medroxyprogesterone acetate (M.P.A.) and melengestrol acetate (M. G. A.) in silicon rubber implants placed sub-cutaneously. The implants last upto three years and can be removed when the zoo wants the animal to breed. As per the NewYork Times news (Chicago Aug., 12, 1984), Dr. Seal said, 50 zoos in the States have used the implants mainly on their large cats.

Mr. J. C. Daniel, Curator, Bombay Natural History Society Bombay entered into correspondence with U.S. Fish and Wildlife Services U. S. A. and could succeed in getting these implants through Paul Joslin, Assistant Director, Brookfield Zoo and Dr. Ulysess Seal of U. S. A. The Wildlife Institute of India, Dehradun was kind enough to bring the implants to the Borivili Park and Dr. Bhattacharjee from the Wildlife Institute came to Safari Park, Borivili and fixed implants in five selected lionesses of the park during the period 6/8/1986 to 10/8/86. Dr. Bhattacharjee was assisted by Dr. Batwe, V. O. of

this Park. The lionesses of the Safari Park were the first in India to have these implants fixed.

Sr. No	Name	Age	Tatoo mark	Implant No.	Wt. of the Compound
1.	Sarika	10 yrs	5	1450	3.41 gm.
2.	Mohini	3 <sup>1/2</sup>	easily identified	1455	3.08 gm.
3.	Jamuna	6 <sup>1/2</sup>	red tag No. 384 on ear	1453	3.45 gm.
4.	Parvati	4 <sup>1/2</sup>	8	1449	5.34 gm.
5.	Chanda	3 <sup>1/2</sup>	9	1454	4.95 gm.

The implants are simple Silicon rubber rods of hardly 2" length containing either the compound MPA or MGA, with quantities of different weights so while implanting, number and weight are to be recorded. It is a simple procedure. Sexually mature females were first selected, vide. the table above. In treatment cage squeezing the animal slightly, Rompun and Ketaset mix were directly injected. When completely immobilized site on the neck below base of ear cleaned and Lignocaine injection given as local anaesthesia. Holding skin in hand incision of 1" was given with sharp surgical blade. The wound was cleaned and the implant was inserted below the skin and the cut was neatly sutured with nylon thread. The wound was properly dressed with antibiotics. A complete physical body inspection was done. Any other injuries noticed were properly treated. The body measurements were noted down, the blood samples was collected and body temperatures were also recorded. The tatoo mark with permanent ink put near base of tail. The animal could completely recover within 3 1/2 to 4 1/2 hours after injection of drugs and actual implanting work could last for 15 minutes.

Presently the Safari Park has only 15 animals, 2 male lions Raj and Gurudutta are old, one dominant male Shankar has been vasectomised, five lionesses have been implanted, one lioness Rani is too old and rest of the animals are too young and can work as control animals. Thus the control measures for leonine population have been undertaken and now the animals are displayed properly and are accommodated comfortably in hygienic conditions. (For hormonal contraception in captive lions reference is taken from study-note prepared by Dr. U. S. Seal and others).

