

Captive Breeding of Asiatic Wild Dogs at Indira Gandhi Zoological Park, Visakhapatnam

G. Ramalingam¹ and K.L.N. Murthy²

Introduction

Indira Gandhi Zoological Park is one of the finest and modern zoos in India located in unique natural settings in the fringes of sprawling coastal city of Visakhapatnam amidst the vast expanse of Eastern Ghats. It came into existence in the year 1972 as per G.O.Ms.No. 579, Forests and Rural Development (For-III) Department Dt. 10.11.1972 and it was inaugurated and opened to public on 19-05-1977. It has a total area of 250 ha (625 acres) carved out from Seethakonda Reserved Forest, encompassed by hillocks, natural catchment areas, streams and sea shore of Bay of Bengal on the eastern side. The zoo being in the fringes of the city is a destination for about 8 lakh visitors annually from the city as well as visitors from all over the country. At present there are more than 850 animals and birds live in open, large moated areas surrounded by natural vegetation. This gives the animals a feeling of living close to their natural habitat.

Dholes

The Asiatic Wild dog called as Dhole, a member of the family Canidae is a threatened species is being reared in captivity at Indira Gandhi Zoological Park. The population in the wild is dwindling due to biotic pressure and prey base habitat reduction. Dhole is listed as Endangered by IUCN and listed under Schedule II of the Wildlife (Protection) Act 1972 and in the Appendix II of CITES.

Breeding of these threatened species in zoos to a viable population and reintroducing them into wild is a challenge because of

MOATS	MALE	FEMALE	PUPS
A	5	3	-
B	2	2	6
C	2	2	-
D	2	2	3



Dhole



Natural enclosure of Dholes

their complex social structure, free ranging nature, the need for space and privacy and the untamable wildness. In spite of the following constrains, Indira Gandhi Zoological Park is the only zoo in Andhra Pradesh and also in the country where successful breeding of Dholes in captivity is in progress since 2007.

In Indira Gandhi Zoological Park, Visakhapatnam the Dhole pack of 5 animals were rescued in 2004

which fell into an open moat and are being reared in captivity.

The Dhole enclosures are very spacious having an area of 2662 sq.m. and 2323 sq.m. with naturally grown Bamboo, Neem, Jamun, Sisso and *Acacia* sp. and whelping dens and water pools.

¹ DyCF and Curator, ² Biologist, Indira Gandhi Zoological park, Visakhapatnam. Email: igzpvizag@gmail.com



Breeding facility

An appropriate off-display moat has also been selected to prevent from human interference (visitors) and to facilitate breeding. This moat is also designed with whelping dens and water pools in the day kraal. The selected breeding pairs with other dholes (as they live in a group) are kept in the moats to facilitate breeding. Now, the Zoo has four moats that facilitate 29 Dholes.

Diet

The adult dholes are fed twice daily with chicken (0.5 kg/animal) in the morning and beef (3-5 kg/ animal) in the evening. The pregnant female's diet is supplemented with vitamins along with 1.5 kg chicken, one litre milk

New off-display moats (old primate vacant enclosures)–two numbers were developed for the four (4) breeding pairs viz., Moat A,B,C and D and scientifically monitored daily activities – behaviours of adults and pups after delivery.

Breeding facility

For the purpose of breeding, the moats have been designed with earthen dens with sandy cushion stratum as a place for hiding and to deliver pups. The night Kraals are spacious divided into cubicles and are provided with water tubs. The hygiene of the enclosure is maintained by cleaning the kraals twice every day.



Den for pup delivery and rearing



Open spacious enclosure



Courtship behaviour

and eggs in their regular feed. Once in a week, it is also given 1 kg of male sheep (Ram) meat along with bone as a source of calcium and to gain more nutrition to growing pups. After the pups wean off from their mother, small pieces (Kheema) of chicken meat/ beef supplemented with vitamins may be provided as their regular diet up to 4-6 months.

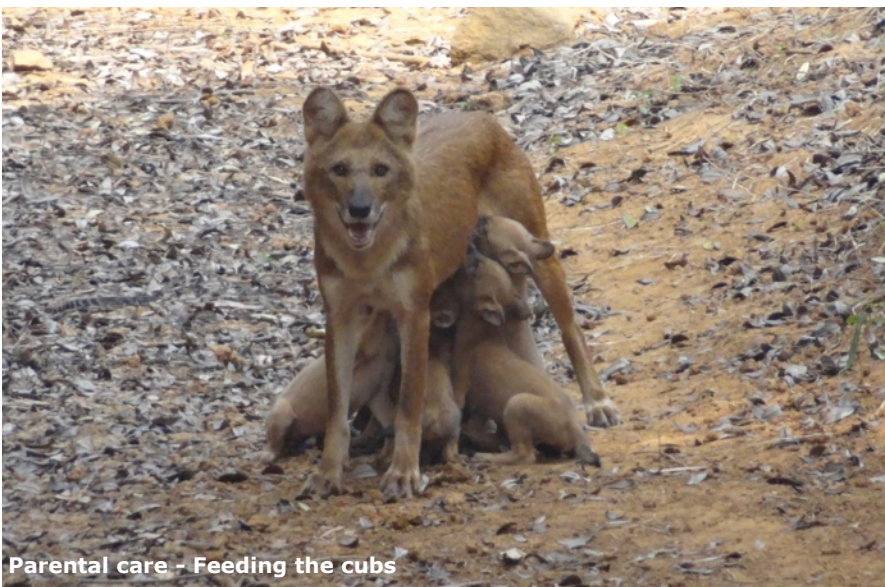
Reproductive Biology

Breeding season commences between mid October and January. The female become sexually mature at the age of two years and the males mature at three years of age. Dholes have a gestation period of 9 weeks. The size of the litter may range from 3-8. Special care is taken by the



Pregnant Dhole

zoo management in feeding and veterinary aspects of the Dhole during this season. The Dhole exhibit typical mating behavior of canids. After a successful mating, the animals whelp in an underground den. After delivery, the female dhole comes out of the den occasionally to check for predators and for feeding purpose. If there happens to be death of any pup they are rejected and are brought out of the den. Only after one month of delivery, the pups come out of the den which is under parental care until they are six months old. This shows their strong social behaviour.



Parental care - Feeding the cubs

Successful Breeding of Dholes

- Keeping a compatible male and female together prior to the breeding season.
- During the breeding season no person other than the animal keeper is allowed inside the enclosure.
- The concerned keeper is advised not to go very often near the whelping den so as to minimize disturbance.
- Once mating is confirmed the female's diet is supplemented with the following:
 - a. Proviboost 10cc /animal/day
 - b. Syr. Osteocal vet 10cc/animal/day
 - c. Syr. Polybion 10cc/animal/day,

Table: Yearwise statistical data of Dhole breeding in IGZP, Vizag

Year	Opening stock				Births			Acquisitions			Disposals			Deaths			Closing stock			
	M	F	U	T	M	F	U	M	F	U	M	F	U	M	F	U	M	F	U	T
2007-08	3	3	6	12	0	0	0	0	0	0	0	0	0	0	0	3	5	4	0	9
2008-09	5	4	0	9	1	0	0	0	0	0	0	0	0	1	0	0	5	4	0	9
2009-10	5	4	0	9	1	3	0	0	0	0	1	1	0	0	0	0	5	6	0	11
2010-11	5	6	0	11	2	2	0	0	0	0	1	1	0	1	1	0	5	6	0	11
2011-12	5	6	0	11	4	3	0	0	0	0	0	0	0	0	0	0	9	9	0	18
2012-13	9	9	0	18	3	3	0	1	0	0	1	0	0	0	0	0	12	12	0	24
2013-14	12	12	0	24	2	1	0	2	0	0	0	0	0	0	0	0	16	13	0	29

d. Tab. Vitafit one tablet /animal/ day

e. along with 1.5 kg chicken, one litre milk and eggs in their regular feed. The female dhole is also given 1 kg of mutton along with bone during its pregnancy as a

source of calcium and to restore its activity.

f. After delivery the female is given Syr Vimeral 10ml/day, and Osteocal vet 20 ml/day in its regular diet.

• After the pups wean off from their mother, small pieces (Kheema) of chicken meat supplemented with vitamins may be provided as their regular diet up to 4-6 months. The physical examination of the pups should be under the supervision of the veterinarian.



Veterinary care of Dholes

The Veterinary aspects are taken care by the Veterinary Assistant Surgeon, duly following the Prophylactic measures like:

- Vaccination with Combined Freeze-dried canine Distemper, Hepatitis, Parvovirus and Para-influenza vaccine once in a year,
- Deworming with Drontol plus, Neomec, and Dectomax (inj) once in 3 months
- Sol. Butax, 2-2.5ml/day is sprayed topically for De-ticking.

Conclusion

By taking precautionary measures at each and every point right from moat designing, hygiene, diet, veterinary assistance, Indira Gandhi Zoological Park management is successful in breeding these threatened species to a viable number. Initially the zoo had only 5 individuals in the year 2004 and now the number has increased to 29 that show the environment created in Indira Gandhi Zoological Park is congenial for breeding of Dholes.



Pups in group showing the social behaviour

To avoid inbreeding and to infuse new blood (heterozygosity), dholes were exchanged between Sri Venkateswara Zoological Park,

Tirupati and they are also breeding in the Zoo atmosphere.

A separate breeding centre is under progress with an initiative to conserve Dholes. From the present number, founder stock will be selected by genetic profiling with the help of LaCONES, Hyderabad and these will be translocated to the newly constructing Conservation Breeding Centre to breed as per CZA guidelines with intensive monitoring and management. We will also plan for rehabilitation of packs in the natural habitat in Eastern Ghats where the dhole population had come down drastically.

Other Project personnel

Sri. A.V. Joseph, PCCF(wildlife), Andhra Pradesh
Dr. V. Srinivas, VAS, IGZP, Visakhapatnam

Technical advices have been taken from the following persons from abroad

1. Mr. Adrian Harland, Animal Manager – Port Lympne, Howletts Wild Animal Trust, UK
2. Dr. Jane Hopper MA VetMB CertZooMed MRCVS, Veterinary Surgeon, Howletts Wild Animal Trust, UK
3. Dr. Jan Bos, Senior Vet, Ouwehands Dieren Park, the Netherlands.
4. Dr. Leon Durbin, Wild Wood Bush craft, UK.

Bibliography

Acharya, B.B. (2007). The Ecology of the Dhole or Asiatic Wild dog (*Cuon alpinus*) In Pench Tiger Reserve, Madhya Pradesh. Ph.D. Diss. Saurashtra University.

Ackerman, B.B., F.G. Lindzey & T.P. Hernker (1984). Cougar food habits in southern Utah. *J. Wildl. Manage.* 48: 147–155.

Aiyadurai, A. and S. Verma (2003). Dog and Bull- An investigation into carnivore-human conflict in around Itanagar Wildlife Sanctuary, Arunachal Pradesh, Wildlife trust of India, New Delhi.

Andheria, A.P., K.U. Karanth and N.S. Kumar (2007). Diet and prey profile of three sympatric large carnivores in Bandipur Tiger Reserve, India. *Journal of Zoology.*

An Ethogram for the New Guinea singing (wild) dog (*Canis hallstromi*), Janice Koler- Matznick, I. Lehr Brisbin, Jr. and Mark Feinstein.

Altman, J. (1974). Observational study of behavior sampling methods. *Behavior* 49(3, 4)227-265.

Brander, A. (1923). *Wild animals in Central India.* Natraj, Dehradun, 1982. Reprint.

Beck off, Mark and Jameson (1977).

Interpretation and Explanation in the Study of Animal Behavior. Vol-I. West view press, San Francisco, CA.

Caro, T.M. and C.J. Stoner (2003). The potential for interspecific competition among African carnivores. *Biological Conservation* 110. 67–75.

Chauhan, D.S., R. Singh, S. Mishra, T. Dadda and S.P. Goyal (2006). Estimation of tiger population in an intensive study area of Pakke Tiger Reserve, Arunachal Pradesh, India, Dehradun, India.

Champion, F.W. and S.K. Seth (1968). *A revised survey of the forest types of India.* Manager, Government of India Press, Nasik, India.

Cohen, J.A. (1977). A review of the biology of the dhole or Asiatic wild dog (*Cuon alpinus* Pallas) *Animal Regulation Studies* 1: 141-158.

Datta, A. and S.P. Goyal (1997). Responses of arboreal mammals to selective logging in western Arunachal Pradesh. Unpublished report. Wildlife Institute of India, Dehradun. 73 pp.

Datta, A., M.O. Anand and R. Nanewadekar (2008). Empty forests: Large carnivore and prey in Namdapha National Park, north-east India abundance, *Biological conservation*, 141:1429- 1435.

Davidar, E.R.C. (1965). Dhole (*Cuon alpinus*) and village dogs. *Journal of the Bombay Natural History Society* 62: 146–148.

Davidar, E.R.C. (1974). Observations at the dens of the dhole or Indian wild dog (*Cuon alpinus*). *Journal of the Bombay Natural History Society* 71: 183–187.

Davidar, E.R.C. (1975). Ecology and behavior of the dhole or Indian wild dog *Cuon alpinus* (Pallas). In *The wild canids. Their systematics, behavioral ecology and evolution:* 109–119. Fox, M. W. (Ed.). New York, NY: Van Nostrand Reinhold.

Durbin, L.S., A. Venkataraman, S. Hedges and W. Duckworth (2004). Dhole. In *Canids: foxes, wolves, jackals and dogs. Status survey and conservation action plan:* 210–219. Sillero-Zubiri, C., Hoffmann, M. & Macdonald, D. W. (Eds). Gland, Switzerland, and Cambridge, UK: IUCN/SSC Canid Specialist Group.

Durbin, L. (2000). "Dhole Home Page" (On-line). Accessed 17 May 2000 at <http://www.dcpbase.demon.co.uk/dcp/>.

Emmons, L.H. (1987). Comparative feeding ecology of felids in a neotropical rainforest. *Behavioral Ecology and Sociobiology.* 20: 271-283.

Fagen, R. (1981). *Animal Play Behavior*, Oxford University Press, New York.

Fox, M.W. (1984). *The Whistling Hunters - Field Studies of the Asiatic Wild Dog (Cuon alpinus)*. State University of New York Press, Albany.

Frank, L.G. (1998). Living with lions: carnivore conservation and livestock in Laikipia District, Kenya. Unpublished Report, Development Alternatives, Inc., Bethesda, Maryland.

Hedgier H. (1977). Ethology and study of animals in captivity, Grzimek's Encyclopedia of Ethology. Pg: 662.

Israel, S. and T. Sinclair (1987). Indian Wildlife. APA Productions, Singapore.

Johnsingh, A.J.T. (1983). Large mammalian prey-predators in Bandipur. *Journal of the Bombay Natural History Society* 80:1-5 7.

Janice Koler – Matznick, I. Lehr Brisbin Jr. and Mark Feinstein (2005). An Ethogram of NGSD, The NGSD Conservation society, USA – 3/2005.

Johnsingh A.J.T (1982). Reproductive and social behavior of the Dhole, *Cuon alpinus*; (Canidae) *J. Zool, Land* 198; 443-463.

Johnsingh, A.J.T. (1985). Distribution and status of dhole *Cuon alpinus* Pallas, 1811 in South Asia. *Mammalia*. 49(2): 203-208.

Karanth, K.U. and M.E. Sunquist (1992). Population structure, density and biomass of large herbivores in the tropical forests of Nagarhole, India. *Journal of Tropical Ecology* 8:21-35.

Karanth, K.U and M.E. Sunquist (2000). Behavioral correlates of predation by Tiger (*Panthera tigris*) Leopard (*Panthera pardus*) and dhole (*Cuon alpinus*) in Nagarhole, India. *Journal of Zoology* 250:255-265.

Karanth, K.U. and M.E. Sunquist (1995). Prey selection by tiger, leopard and dhole in tropical forests. *Journal of Animal Ecology* 64: 439-450.

Kellert, S.R. (1985). Public perceptions of predators, particularly the wolf and coyote, *Biological Conservation* 31 (1985), pp. 167–189.

Krishnan, M. (1972). An ecological survey of the larger mammals of peninsular India. *Journal of Bombay Natural History society*.69:42-47.

Mishra, C., M.D. Madhusudan, and A. Datta (2006). Mammals of the high altitudes of western Arunachal Pradesh, eastern Himalaya: an assessment of threats and conservation needs. *Oryx*, 40:1:29-35.

Prater, S.H. (1980). The book of Indian Animals. *Bombay Natural History Society*; Revised edition. Pp321.

Stewart, P. (1993). Mapping the Dhole. *Canid News* - Newsletter of the Canid specialist Gropup1: 18-21.

Venkataraman, A.B., R. Arumugam and R. Sukumar (1995). The foraging ecology of dholes (*Cuon alpinus*) in Mudumalai Sanctuary, southern India. *Journal of Zoology* 237: 543-561.

Wang, S.W. and D.W. Macdonald (2006). Livestock predation by carnivores in Jigme Singye. Wangchuck National Park, Bhutan *Biological Conservation*, 129(4): 558-565.

Patricia A. Goodmann and Erich Klinghammer (1990). *Wolf Ethogra*. North American Wildlife Park Foundation, 31pp.