CENTRAL ZOO AUTHOIRTY

APPLICATION FOR SMALL GRANT FELLOWSHIP
Please read appendix I for instructions (last page of this document)
Form must be filled in English

Internal Project Number (To be filled in by CZA): .....

1. GENERAL INFORMATION

Date of application: 22-10-2005

Name of the Zoo / organization: Indira Gandhi Zoological Park, Visakhapatnam

Contact person/ project leader : B. Vijaya Kumar, Curator, Indira Gandhi Zoological Park, Visakhapatnam.

Co-project leader : Dr. V. Srinivas, Veterinary Assistant Surgeon, Indira Gandhi Zoological Park, Visakhapatnam.

2. CLASSIFICATION OF PROPOSAL

Improvement of the Zoo	Scientific Management	Ex-situ Conservation	Welfare of the animals	Any other, please specify
	✓	✓	✓	

3.. DATE OF INITIATION OF THE PROJECT:

Soon After approval by Central Zoo Authority.

4. DURATION OF THE PROJECT:

THREE YEARS

5. LOCATION OF THE PROJECT.

Region /State : ANDHRA PRADESH

Closest main city : VISAKHAPATNAM, ANDHRA PRADESH, INDIA

6. STAFF INVOLVED IN PROJECT (please include Curriculum Vitae of the individuals):

1. Name (+ title) + Zoo/Organization: B. VIJAYA KUMAR, CURATOR, Indira Gandhi Zoological Park, Visakhapatnam

Period to be spent on the project from: ..... to: 3 Years (day/month/year/) for..... hours/week

Role / Function in the project: Supervision of the Research Project & Research Project leader

2. Name (+title) + Zoo/Organization: Dr. V. Srinivas, Vety. Asst. Surgeon, Indira Gandhi Zoological Park, Visakhapatnam.

Period to be spent on the project from: ..... to: 3 Years (day/month/year/) for ..... hours/week

Role / Function in the project: Co-Research Project Leader

3. Name (+title) + Zoo/Organization: PRUDVIRAJ, M.Sc. (Zoology)

Period to be spent on the project from: ..... to: 3 Years (day/month/year/) for ..... hours/week

Role / Function in the project: BIOLOGIST.

7. PROJECT PROPOSAL

7a. Background and history of the project (max. 300 words)

The Indira Gandhi Zoological Park, Visakhapatnam has nominated by Central Zoo Authority f conservation breeding of Indian wild dogs (Cuon alpinus) in captivity. The Indian Wild Dog threatened species whose number is declining in Wild. The prime reason is low tolerance by huma to animals predation, besides habitat fragmentation & destruction of habitat. Unless detaile Investigation comes through to safe guard the future of the wonderful carnivores, and the survival under threat.

During this uncertainty, the Visakhapatnam zoo offers excellent platform to safeguard th threatened species and the viable population in the captivity can act as a buffer population and or gen pool originality future reintroduction or restocking the population in wild. The complex social structur free ranging nature, need for space and privacy apart from untameable are the limitations to bree them in captivity. In spite of the above mentioned handicaps, the wild dogs have successfully bred i Indian zoos and Visakhapatnam zoo is one amongst them. Though initial success achieved twice i breeding wild dogs in Visakhapatnam Zoo, but it is short lived and stopped breeding again.

In order to understand breeding behaviour reproduction biology and external environmental needs enrichment of the species will encourage them successful breeding in captivity. Thus Visakhapatnam zoo plans to initiate, programmatic, measurable and long lasting scientific programme to study Wild dogs (or) dhole in captivity.

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

1. The wild dogs are very susceptible to even the slightest change in & around enclosure, and prefer entail areas of enclosure, reproduction biology, courting, mating, growth and early cub development, role of siblings, rest of the pack in the cub rearing are still not clearly understood.

2. Prime reason for decline of this species is due to low tolerance by humens to the animal predation. Thus ;successful breeding of the species in captivity could act a buffer population for future restocking or reintroductions and also acts as a gene pool.

3. Study the breeding behaviour, reproductive biology and enrichment needs of the wild dogs in captivity.

4. Observations of growth and early cub development.

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

1. To observe and document start and length ofoestrus periods, duration, intervals and seasonal fluctuation and influence of ecological aspects on oestrus in wild dogs.

2. Behavioural observation on mating behaviour, which includes natural selection/choice mating, courtship, mating duration, coition and role of other members in pack, percentage of success, mating pair preference in enclosure etc.

3. To create an optimal environment in enclosures to allow successful breeding o wild dog and response to enrichment.offered and influence of enrichment on breeding.

4. Observation on growth and early cub deveopment includes role of mother, father and other pack members in kitten, Development preference of diet and quantities consumed and its variations.

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

1. A resident biologist will be employed for the project period. The biologist along with the keepers will form a team and start daily observations on the wild dogs.
The resident dog pack will be individually marked with colour depending on the sex and This will ease identification of individuals.
Enrichment activities will be provided to encourage mating. Disturbance will be minimised visual contact with other enclosures will be minimised by installing natural bamboo screens by planting bamboo saplings between the enclosures. Initial observations will be made identify the role of each dog in the social structure. Once differentiated the dogs will observed individually for signs of sexual maturity and the response to the pack and breeding male. Females will be observed daily for signs of initiation of oestrus.
The observations will be recorded daily and once oestrus is noticed 15 minute/hour observations will be recorded on the female and its behaviour will be documented as ethograms.
This daily observation will be carried out through out the oestrus period and the collected data set will be compiled at the end of every week.
Observations of male and female courtship and the preference or lack of preference to certain portions of the enclosures will be recorded separately. If there is an obvious need for any enrichment or change in enclosure design or structure this will be immediately met and the behavioural reaction to this change will be recorded. Like wise all the behaviour associated with breeding will be documented separately and weekly compilations will be made.
There will be a monthly compilation of the weekly data and a group meeting with the research team where the month's data will be presented. Major changes in the research design or approach will be discussed only with a set of data on hand and with adequate understanding of the situation. Physical handling of the dogs will be avoided or minimised to the least to reduce stress.
2. Upon successful mating and conception the wild dogs will not be further disturbed and be allowed to stay all the time in the burrows they usually dig (this has been recorded earlier with wild dogs in the vizag zoo). Observations on the role of the parents and the rest of the pack will be documented. Day to day data will be recorded on the status of the cubs from an external observation point. At all costs physical handing will be avoided or done only when utmost required. Along with the physical observations video recording of the dens using an endoscope will be attempted to understand the behaviour of the cubs, mother cub interaction and early cub growth. Daily observations will be carried on the growth, development, changes in external pelage and morphology. Data will be compiled on a weekly basis and reviewed and once in a month a detailed discussion will be help with the consolidated data collected in that entire month.

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

	NAME	LOCATION
NGO's	Society for Nature Conservation and Education	Visakhapatnam
Ministries	.....	
Universities :	Andhra University	
Research Institutes / or any other :	.....	

Type of the collaboration and support: Technical Support and collaboration

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).

Indira Gandhi Zoological Park, Vjsakhapatnam and provides space and personnel, others if any for cause of conservation research.

9. BASIC TIME SCHEDULE

The proposed project is intended to be carried for a period of 3 years depending of the release of the grant the time line for the studies will be as below:

Year	Particulars	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
1	Pre-project Preparation (includes Personnel selection and training and other projected related arrangements.)	**	**	**									
	First level observations				**	**	**	**	**	**	**	**	**
	Enrichment activity				**	**		**	**		**	**	
	Quarterly review on progress							**			**		
	Annual report												
2	Observations on early cub development	**	**	**	**	**	**	**	**	**	**	**	**
	Enrichment activity	**		**		**			**				
	Annual Review	**									**	**	**
	Annual report												
3	Oestrus and cub based observations	**	**	**	**	**	**	**	**	**	**	**	
	Final review	**											
	Final Project findings report					**	**						
4	Post project follow up	**		**		**		**					

10. OUTPUT

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

1. The successful breeding of endangered species in captivity
2. Documentation of Wild dog behaviour would useful for both ex-situ and in-situ co...
3. Documentation of Enrichment activity visa vis breeding success.
4. Ex-situ conservation research knowledge of gained can be exchanged betwe... Researchers which opens new chapter for wild dog research related aspe... maintenance of genetics sustainance of wild dog population in the wild.
5. Growth of early cub development, diet, nutrition etc.
6. On completion of project, would use for scientific papers on above aspects beside... research plan & conservation education etc

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

Wild Dog is endangered species of the eastern ghats one of the biogeographic Ze... of the country for which successful breeding of this species in captivity would useful to resto... reintroduction of species in wild as per IUCN protocol for the sustenance of the species in wild, useful for management of the species in captivity in simulation of natural surroundings.

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

This three years' project can be evaluated periodically by the parameters inclu... succeful conception of the wilddog, survival%, health of the animal & cub, growth and developm... birth rate, litter size, regular oestrus (periods), successful mating etc.

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

This project has taken care of all possible source of fluctuations of available stock &... co-ordination conservation bred programme in planed to maintain to genetically socially vi... population logiastics, staff motivation etc. are also taken care and incease of shortfall of finances w... will be met from State Share.

3. Name Department / Institute:.....

Address: .....

.....

Amount applied for or guaranteed: Rs.___

13. DECLARATION

The information submitted in this application is true, to the best of my ... significant developments arise after this application is made, I shall notify the M... Zoo Authority.

SIGNATURE

Director/Curator/ Officer-In-charge of the Zoo (Supervisor of the Research)	Research Project Leader	Chief Wildl... Municipal C... Owner/Zoo ...
Signature: (B. VIJAYA KUMAR) Date: 22.10.05 Seal	Signature: Date: 22/10/05 22.10.05	Signature: Date:

Include with the proposal:

- A curriculum vitae of the applicant and individuals involved in the project
- Background information about the zoo involved (max. 1 page)
- Budget overview

Brief Background Information:

Indira Gandhi Zoological Park, Visakhapatnam is unde the Andhra Prades... Forest Department & is recognised by Central Zoo Authority as large zoo to serve as role mod... for other upcausing zoos of the country.

The Indira Gandhi Zoological Park, came into the existence in the year 197... Visakhapatnam as per the Government Order Ms.No.579. Forest and Rural Development (For... Department, dated 10-11-1972. Flanked by wooded hills on either side, nesting in a beautiful va... in the Eastern Ghats and washed by the waters of Bay of Bengal on the Eastern side the present... unique picturesque beauty to all who visit it. The Zoo was inaugurated by Sri Ibrahim Ali Ans... Minister for Forests and Walkfs and opened to public on 19-05-1977.

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

The projects progress will be regularly monitored by the two or three external reviewers who will also act as external supervisors for the proposed project. Their particulars will be supplied after they approve of the project and their participation.

Budget

S.No	Particulars	Year 1	Year 2	Year3	Total Amount in Indian Rupees for year 1	Total Amount in Indian Rupees for 3 years.
1	Personnel					
a	Salaries	One biologist 8000* 12	One biologist 8000*12	One biologist 8000*12	96,000.00	2,88,000.00
b	Incentives for zoo keepers.	Not to exceed 6000/year	Not to exceed 6000/year	Not to exceed 6000/year	6000.00	18000.00
2	Equipment					
a	Behavioural count meter.	5000.00				5000.00
b	Enclosure Enrichment design and Installation	12,000.00* 6months	12,000.00* 6months	12,000.00* 6months	72,000.00	2,16,000.00
c	Infra red lights and observation aids for viewing wild dogs in dark hours.	12,000.00	Repairs and maintenance Not exceeding 1000.00/year	Repairs and maintenance Not exceeding 1000.00/year	12,000.00	12000.00 2000.00
3	Miscellaneous					
a	Stationary	8000.00	8000.00	8000.00	8,000.00	24,000.00
b	Postage and telephones	5000.00	5000.00	5000.00	5,000.00	15,000.00
c	Annual Reports	2000.00	2000.00	2000.00	2000.00	6.000.00
						5,86,000.00
4	Emergency fund 2% of the total project cost.					11,720.00
	Total Project Budget					597,720.00

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

- In case of Forest Dept./Corporation/Trust: please also mention the details
- Indicate if source is applied for or already guaranteed

2. Name Department / Institute: Self
Address:.....

Amount applied for or guaranteed: Rs.___

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The main objectives of creating this Zoo are:

1. Ex-situ conservation of critically endangered fauna with special focus on the endemic fauna of Eastern Ghats.
2. To propagate the values of Wildlife and its conservation through education and interpretation aimed at wide public appreciation.
3. To promote wildlife research aimed at conservation and management.

It has been a premier public visiting place since then, and has attracted 319570 visitors during 2004-2005.

Zoo Geography:

Unlike conventional Zoos, this Zoo spreads over undulating topography, draped by hills, washed by the shores of the Bay of Bengal and the deciduous forest. The Zoo spreads over an area of 625 Acres or 250 Ha. In addition to this an extent of 21.33 Ac. of Marine Land Complex Area was included inside the Indira Gandhi Zoological Park, Visakhapatnam.

Zoo Residents:

Most of the Zoo Residents are acquired from other Zoos, or from the rescue squads a are born in the Zoo. Adhering to the National Zoo Policy, 1998, except for founder animals for proved breeding programme and for infusion of new blood into inbred group, the emphasis of the is not to collect animals from the wild. Also adhering to the I.U.C.N. Policy on captive breeding, zoo concentrates on animals in the climatic Zone of Eastern Ghats and near ranges. The Zoo animals, as far as possible, are housed in open enclosures which allow them to fulfill largely their behavioral and physical requirements.

This Zoo has specialized sections like the large & small carnivores section, primates section, deer and antelopes section, herbivores, bird aviaries, etc. A majority of biodiversity is not represented in the Zoo and others will form part of its future expansion programmes.

Herbivores:

In this classification of wild animals among the mammals, the Zoo has Indian Elephant, Gaur, Barking deer, Spotted deer and Samabar. Among the antelopes, Nelgai, Chowsingha and Black bucks are housed in large open moat enclosures. Among the Rodents, the Indian Porcupine occupies a pride of place.

Primates:

Langurs basically vegetarian in nature, only the common languor are exhibited. Maca baboons which are omnivorous, whose diet varies from insects, grubs and spiders, represented by the Rhesus, Bonnet, Stump Tailed Macaques, Sacred and Olive Baboons and Baboons.

Carnivores;

The exotics among the large cats that are exhibited are jaguars and pumas. Other than the lions, tigers and panthers. The small carnivores section houses includes jackal, hyena, wolf, Rat Wild dog.

Reptiles:

Lizards like the water monitor and common monitors are exhibited in the Indira Gan Zoological Park, Visakhapatnam. All the three Indian Crocodiles – Mugger, Gharial and Estuari Crocodiles are provided separate enclosures with large ponds in the Zoo. The snakes section ha Python, Cobra & Rat snakes. Star tortoise and terrapins are two other reptiles in the Zoo.

Aves.

The schedule 1 bird of the Wildlife Act the Pied Horn bill, the emblem of the Zoo is displayed in the aviaries. The other exhibits are red jungle fowl, patridges, jungle bush quail, rose ringed parakeet, blossom headed parakeet, pelicans, cranes and storks. The exotics like sulphur crested cockatoo, goffins cockatoo, etc., are housed separately in the parrots aviary and in the love bird section fishers, peach faced, blue masked love birds and budgerigars are housed. The pheasants constitute a separate section with silver pheasant, red spur fowl, red jungle fowl, Ring necked, Painted spur fowl, Khaliz and common peafowls.

CURRICULUM VITAE

	:	B. Vijaya Kumar
Qualification	:	M.Sc., (HORTICULTURE) from A.P Agricultural University, Andhra Pradesh, Hyderabad.
		P.G Diploma in wildlife Management. Wildlife Institute of India Dehradum
		SFS Diploma which is equalant to M.Sc, (Forestry) under deemed University of FRI Dehradum.
Presently Working as :		Curator, Indira Gandhi Zoological Park, Visakhapatnam
		Associated with setting up of first Ecological Tourism Project in Easter Ghats by Andhra Pradesh State government. This is to create conservation awareness among the people to enlist the public support for cause of conservation.
	:	Associated in studying status and distribution of small cats in Eastern Ghats, 2004 along with Sri Sekhar, Principal, Investigator for small cats project of India.
		Associated in declarationof Kambalakonda sanctuary at Visakhapatnam, Andhra Pradesh, India and preparation of Management Plan
Zoo Works	:	Parasitic prevalence in captive felids - Published
	:	Ecotourism - Published
	:	Breeding of rock Pythan in captive - Published
	:	Breeding of estuarine Crocodiles in captive - Un Published
	:	Assessment of genetic purity of red jungle Fowl in captive - Un Published
	:	A study on wildlife Habitat relations (WHR) in Ananthagiri of Eastern Ghats - Published
	:	Zoos - instrument for conservation - Un Published
	:	A Note on Migratory breeding grounds at Tenemelapuram of Srikakulam (Dt.) A.P, India - Un Published

Conducted Teacher Training Workshop at Visakhapa
Coordination with WWF AP Chapter.

Future Plans :

1) Conservation breeding of wild dog's in Captivity.
2) Monotoring of adreno corticoids activity and reproductive sta
Faecal. Gluco Corticoid, Metabolites to investigate
reproductive biology of canines at Vizag Zoo.
3) Environmental enrichment studies Vis Vis stress levels.
4) Estimation of leopard carrying capacity of the kambalakonda
Sanctuary Visakhapatnam India and evaluating conservation
options for ensuring survival of the sanctuary.

Interests and Hobbies :

1) Bird Watching
2) Conservation education and outreach activities
3) Environmental enrichment studies.
4) Visting to wilderness and Ecologically importance sites.

CURRICULUM VITAE

Name : Dr. V. Srinivasa Rao.

Qualification : B.V. Sc. from A.P Agricultural University, Andhra Pradesh, Hyderabad.

Presently Working as : Vety. Asst. Surgeon, Indira Gandhi Zoological Park, Visakhapatnam

Experience : Prescribed as follows:

1. Three weeks training programme at Alpoore Zoo, Calcutta conducted by Central Zoo Authority & Wildlife Institute of India, Dehradun on "CAPTIVE BREEDING & MANAGEMENT OF ENDANGERED SPECIES."
2. Two weeks training programme on "HEALTH CARE & MANAGEMENT OF ELEPHANTS," Mannuthy, Kerala, conducted by Central Zoo Authority of India, New Delhi.
3. Three days training-cum-workshop at Thrivandrum on "NEONATAL CARE OF ENDANGERED SPECIES" conducted by Central Zoo Authority of India, New Delhi.
4. Two days conference & workshop at Chennai on "BLOOD BORNE PARASITES, DIAGNOSES & TREATMENT IN WILD ANIMALS" conducted by Central Zoo Authority of India, New Delhi.
5. Underwent training at Nandankanan Zoo, Alipoore Zoo, Padmajanaidu Himalayan Zoo Park, Darjeeling, Sikkim Zoo (Gangtok) & Thrivandrum Zoo.
6. Underwent training at Nehru Zoological Park, Hyderabad for "IMMOBILIZATION & TRANSLOCATION OF WILD CARNIVORES & HERBIVORES."
7. Experienced in Capturing Wild Bears at Vizianagaram District & Herbivores at East & West Godavari District and Capture & Translocation of Circuses Tigers & Lions from Nandankanan Zoo to Indira Gandhi Zoological Park, Visakhapatnam.
8. More over having 5 years experience at Indira Gandhi Zoological Park & Animal Rescue Centre, Visakhapatnam.

CORRICULAM VITAE

1.	Name in Full	**Yaram. Joji Babu** Act % Vizag zoo-cum-Research Supervisor
2.	Father's Name	(Late) Y. Sundara Rao
3.	Date of Birth	28-3-1955
4.	Mother Tongue	Telugu
5.	Languages known	English, Hindi, Telugu, Tamil
6.	Qualification:	
	a) Graduation/Post Graduation/P.hd	Graduation in B.Sc. P.G-D in Environmental Science.
	b) Computer Knowledge:	
	c) Computer literate/Basic knowledge	Having Basic Knowledge in Computers. about Computers/Diploma in Computer/ degree in Computer Science.
7.	Date of entry into Service	1-11-1976 to 31-10-78 at S.F.R.C. COIMBATORE
8.	Work Experience	Worked in Watershed management and gained experience in Natural resource protection
9.	Interests	1) Enrichment of enclosures to simulate the natural environment 2) Birding etc.,

Udaya Bhaskara Reddi
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Referee's Assessment Report

on the Project entitled "***Cuon alpinus* Indian wild dog ex-situ breeding and enclosure enrichment programme."**

Habitat destruction, prey scarcity, pathogen severity are some of the major casues for the dwindling of wild dog population especially in the Eastern ghats. If timely measures are not initiated for its conservation there is every threat of extinction of this species. Apart from improving habitat conditions, urgent measures must be taken to breed the endangered ones in captive state for successful reintroduction and recolonisation of the species. Hence, research on captive breeding of the endangered wild dogs should be given highest priority. The project proposal from the Indira Gandhi Zoological Park is worth pursuing. Knowing the dearth and importance of the research topic and zeal and capabilities of the investigator, I strongly recommend the project for a liberal aid.

Eubreddi

Prof. E.U.B.REDDI, M.Sc.,Ph.D.,P.G.D.A.S
HEAD
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REFERENCE STATEMET

Mr. B.Vijaya Kumar is a Post Graduate and P. G. Diploma holder with **Gold Medal** in **Wild Life management** (Wild Life institute of India – Dehradun). I know him since 1999 as Manager, Ecotourism Project. Mr. Vijaya Kumar is a hard working and diligent officer. He is instrumental to start the **Jungle Bells Project** as a part of ecotourism in Andhra Pradesh. At present as a Curator of Indira Gandhi Zoological Park, Visakhapatnam, he introduced some special methods to develop the **captive breeding** in wild animals. I am sure that under the leadership of Mr. B. Vijaya Kumar the Project team has ability to address the problem and the team can come with pragmatic, measurable and long term solutions for long time survival of the **endangered species of Eastern Ghats.**

The outcome of the project will also be reviewed periodically to maintain the project to achieve the objectives entitled.

(Prof. A. SREE RAMULU)

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Letter of reference.

25-10-2005

To,
The Scientific Research Coordinator,
CZA, New Delhi.

Sub: Behavioral studies on wild dogs at the Visakhapatnam Zoo.

Dear Sir, It is a great pleasure to know that the CZA is actively encouraging research work on animals in Zoo's. Ex- situ behavioral research work planned at the visakhapatnam zoo with special emphasis on the wild dogs is a very important study that will enable us to effectively and efficiently breed wild dogs in captivity. The dwindling wild populations of wild dogs is another pressing concern. The few studies conducted in the wild, like the study of wild dog ecology by the WII researcher Mr. Bhaskar Acharya at the Pench Tiger Reserve suggest active, long term behavioral studies on wild dogs and successfully breeding the dogs to repopulate wild populations. Preserving all the genetically different varieties of wild dogs found in our country is another important feature that will evolve out of breeding programs.
The research work on estimating the cortisol levels in wild dogs as suggested and proposed by Mr. Vijay Kumar (Principal Investigator, Vizag Zoo wild dog project and Curator Vizag Zoo) is a very important work for the effective management of wild dogs in captivity. The study will increase our understanding into the conditions wild dogs require to naturally breed in Zoo conditions. This information and understanding is most important in long term breeding programs. The information will also help to manage and conserve wild populations of wild dogs especially in locations where their ranges overlap with human habitations.
Our organization is actively involved in behavioral research on carnivores (In-situ and Ex- situ) and we promise support to Mr. Vijay Kumar on the wild dog project. We wish to involve both in the planning and the execution of the project and also support the project with available literature on the topic.

Wishing the exiting project good luck.

Regards,
Shekhar

Kolipaka Srinivas Shekhar
Wildlife biologist and Principal Investigator
India small wildcat project.

P.S: For any clarification on the above I may be directly contacted on mail at shekhar_k_s@yahoo.com or sncae_india@yahoo.com.

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