Project proposal submitted by
National Tiger Conservation Authority for seeking financial assistance
under CAMPA

Project title
Establishing Metapopulation of Cheetahs in India
2022-23

National Tiger Conservation Authority
Ministry of Environment, Forest and Climate Change

Project Title: **Establishing Metapopulation of Cheetahs in India**

Duration of work:	One year from 2022-23 Extendable as required after review
Budget:	Total year budget: INR 30.5 Crores INR
Funding Agency:	National CAMPA, Ministry of Environment Forests & Climate Change *through* National Tiger Conservation Authority

1. Introduction

Large carnivores play a pivotal role in an ecosystem by shaping species interactions resulting in cascading effects across tropic levels (Ripple & Beschta 2012). Predators that hunt by coursing their prey are important elements of the ecosystem that shape population structure (Jhala & Isvaran 2017), and act as an important evolutionary force of natural selection (Fortin *et al*. 2005). Cheetah (*Acinonyx jubatus*) is one such predator that has been extirpated from the Indian sub-continent by human actions after India became independent and a republic (Divyabhanusinh 1995). Restoring lost biodiversity, especially, an important element of the ecosystem that acts as an umbrella and flagship for neglected habitats like grasslands and open forests, is a worthy endeavor for any Government (Ranjitsinh & Jhala 2010). Reintroductions of top carnivores after the initial threats for their extirpation have been addressed is a well-established norm to restore functional ecosystems in their entirety (Hayward & Somers 2009, Wolf & Ripple 2018). The reintroduction of wolves in Yellowstone National Park and Idaho in the USA (Fritts *et al.* 1997), tigers in Sariska and Panna (Check 2006, Gopal *et al.* 2010), lions, cheetah and spotted hyena in parts of South Africa (Boast *et al.* 2017, Hayward *et al.* 2007a, Hunter *et al*. 2007) are examples of top carnivore reintroductions in modern times. The conservation of the cheetah has been a priority in India since the first Indian Wildlife Board meeting in November 1952 well before it's extinction in India. But it came into prominence again after an international workshop on cheetah reintroduction held at Gajner in Rajasthan during September 2009, where National and

International experts participated and endorsed the idea of conducting a scientific study on its feasibility. Subsequently, Wildlife Trust of India and the Wildlife Institute of India (WII) conducted assessments of 10 potential sites and evaluated the feasibility of reintroducing the cheetah in India based on the International Union for Conservation of Nature (IUCN) guidelines for reintroductions that consider species viability based on demography, genetics and socio-economics of conflict and livelihoods (Ranjitsinh & Jhala 2010).

Action plans in consultation with the respective States for the three best potential sites- Kuno National Park (NP) and Nauradehi Wildlife Sanctuary (WLS) in Madhya Pradesh and Shahgarh landscape in Rajasthan were developed (Jhala *et al.* 2011a, 2011b & 2012). However, the Hon'ble Supreme Court of India in its judgement on the Public Interest Litigation (PIL) filed for reintroduction of Asiatic lions into Kuno NP (formerly WLS) in Madhya Pradesh (MP) considered the reintroduction of the cheetah into Kuno WLS as "Illegal" (Judgement of the Supreme Court of India 2013). On consideration of an affidavit filed by the National Tiger Conservation Authority (NTCA), Ministry of Environment, Forest & Climate Change (MoEF&CC)- Government of India, the Hon'ble Supreme Court reconciled its judgement and permitted the introduction of cheetah from Africa into India on an experimental basis (Order of the Supreme Court of India 2020).

As per the directions of the Supreme Court of India in 2020, cheetah introduction in India is being overseen by the NTCA, MoEF&CC, guided and directed by the committee of experts designated by the Supreme Court of India comprising of Dr. M.K. Ranjitsinh, Dr. Dhananjai Mohan and Additional Director General (Wildlife), MOEF&CC. The WII was given the task of providing technical assistance and coordinating the project of introducing the cheetah headed by Dr. Y.V. Jhala, with team members- Prof. Qamar Qureshi, Dr. Sutirtha Dutta and Mr. Bipin C.M., by the NTCA and the expert committee on cheetah introduction. Further, additional five (05) sites- Mukundara Hills Tiger Reserve (TR), Shergarh WLS, Bhainsrorgarh WLS in Rajasthan and Gandhi Sagar WLS and Madhav NP in MP were also assessed based on the IUCN guidelines for reintroductions, by the WII on the request of the State Governments along with the reassessment of Kuno NP and Nauradehi WLS during 2020- 21 (Jhala *et al*. 2021a).

Kuno Palpur NP in the State of Madhya Pradesh was rated high on the priority list for considering the introduction of the cheetah because of its suitable habitat, adequate prey base and large potential contiguous landscape. According to the latest assessment by the WII, currently, Kuno NP (Area-748 km^2) can hold 21 cheetahs and the potential cheetah habitat of ~5000 km^2 in the surrounding larger landscape with restorative inputs can accommodate up to 36 cheetahs (Hayward *et al*. 2007b, Jhala *et al*. 2021). The other potential sites for establishing cheetah populations are Nauradehi WLS– MP, Darrah predator enclosure in Mukundara Hills TR, Shahgarh Landscape- Rajasthan and Interstate cheetah conservation area comprising of Gandhi Sagar WLS-Reserve forests of Neemach, Mandsaur, Chittorgarh Divisions of MP and Rajasthan (Jhala *et al*. 2021)

Subsequently, an Action plan for introduction of cheetah in India in accordance with the latest IUCN guidelines (IUCN 2013) for reintroductions and conservation translocations to ensure population viability of translocated cheetah in India in a metapopulation framework was jointly prepared by Wildlife Institute of India, National Tiger Conservation Authority and Madhya Pradesh State Forest Department and released by the Hon. Minister of Environment, Forest and Climate Change Shri. Bhupendra Yadav in January 2022. The action plan describes in detail the

various planning and management aspects incorporating the social and biological considerations of pre translocation phase that have been undertaken as part of the preparations for bringing the cheetah back to India. Further, the required protocols, precautions and details of translocation phase which are being/ would soon be undertaken as well as the management and monitoring of post translocation and release phase are addressed adequately with roles and responsibilities identified and assigned (Jhala *et al*. 2021).

On the invitation of NTCA, in June 2022, cheetah experts and project collaborators Dr. Laurie Marker, Mr. Vincent van der Merwe, Dr. Adrian Tordiffe, Associate Professor, Dept. of Paraclinical Sciences, Faculty of Veterinary Science, University of Pretoria and Mr. Simon Naylor, Conservation Manager, Phinda Game Reserve, &Beyond, South Africa visited Kuno, Mukundara and Gandhi Sagar with WII team to provide additional inputs and management recommendations met officials of Madhya Pradesh State Government, Madhya Pradesh State Forest Department, NTCA, MoEFCC and Hon. Minister of Environment, Forest and Climate Change for discussing, planning and finalizing the plethora of activities required for translocating cheetah to India.

Over the last two years, multiple visits, meetings and discussions have been conducted with cheetah experts and officials of Namibia and South Africa for addressing/ completing the different modalities, formalities, logistics, permissions and paperwork related to translocation of cheetah to India. Twenty (20) wild and healthy cheetahs (12 in South Africa and 8 in Namibia) have been identified/captured/ quarantined by the project collaborators in their respective countries and are almost ready for translocation to India. A Memorandum of Understanding between Namibia and India on cheetah and biodiversity conservation was signed on July 20, 2022 by Hon'ble Deputy Prime Minister and Minister of International Relations & Cooperation Ms. Netumbo Nandi-Ndaitwah on behalf of Government of Namibia and the Hon'ble Minister of Environment, Forest and Climate Change Shri. Bhupendra Yadav on behalf of the Government of India. Further, the MoU between South Africa and India on cheetah and biodiversity conservation has been finalized and will be ratified soon. As decided by the Government of India, the first batch of ~15 to 20 cheetahs from South Africa and Namibia would be translocated to Kuno before the 75th year of the India's Independence day celebration on August 15, 2022.

As directed by the NTCA, the proposal prepared here is a subset of the larger project commenced in 2020 for establishing viable cheetah populations in a metapopulation framework according to the Action plan on introduction of cheetah in India based on IUCN guidelines (Jhala *et al*. 2021). As a first step as proposed here addresses the actual transfer of cheetah from South Africa and Namibia to India, their soft release and staging, release as free-ranging animals at Kuno National Park, and subsequent monitoring required for establishing breeding populations. Additionally, initiate ecological restoration of Gandhi Sagar Wildlife Sanctuary and Nauradehi Wildlife Sanctuary to prepare the area for establishing other cheetah populations. The activities proposed here are planned for a period of one year and after review of its progress and need, may be further extended as required. For the long-term viability of the cheetah in India it is essential to establish 3-5 breeding populations in suitable habitats and then manage them as a metapopulation with supplementation from Southern Africa as may be required (Jhala et al. 2021).

2. Project Goal

Establish viable cheetah metapopulation in India that allows the cheetah to perform its functional role as a top predator and provides space for the expansion of the cheetah within its historical range thereby contributing to its global conservation efforts.

3. Project Objectives

1. To establish breeding cheetah populations in safe habitats across its historical range and manage them as a metapopulation.
2. To use the cheetah as a charismatic flagship and umbrella species to garner resources for restoring open forest and savanna systems that will benefit biodiversity and ecosystem services from these ecosystems.
3. To enhance India's capacity to sequester carbon through ecosystem restoration activities in cheetah conservation areas and thereby contribute towards the global climate change mitigation goals.
4. To use the ensuing opportunity for eco-development and eco-tourism to enhance local community livelihoods.
5. To manage any conflict by cheetah or other wildlife with local communities within cheetah conservation areas expediently through compensation, awareness, and management actions to win community support.

4. Aims of Cheetah Translocation in Kuno National Park and ecological restoration of Gandhi Sagar Wildlife Sanctuary for cheetah translocation

The primary aim is to establish a free-ranging population of cheetahs in and around the Kuno NP of Madhya Pradesh (MP). Further, this population in Kuno NP will be managed as a metapopulation with other two to five established populations of cheetah in India with occasional "immigrants" brought in from Africa, as and when needed.

Within this larger goal, the project will strive to achieve the following objectives:

a. Provide adequate security and conserve local flora and fauna.

b. Revive and maintain the grassland and open forest systems existing in the Protected Area (PA) and adjacent areas in an optimum productive state and thereby evolve management techniques and practices for better conservation of these habitats.

c. Build the capacity of the state forest department in the field of habitat and prey management, in view of the emerging needs.

d. Use the expertise of South Africa and MP state forest department in mass translocation of herbivores, particularly blackbuck, nilgai and chital, in view of the emerging need for protection of crops and scientific management of wildlife populations while simultaneously augmenting prey base in Kuno NP and other cheetah introduction sites.

e. Conserve and enhance the faunal diversity, especially the threatened species, such as the gharial (*Gavialis gangeticus*) and the chousingha (*Tetracerus quadricornis*) and provide a future safe haven for even more endangered species such as the caracal (*Caracal caracal*), the wolf (*Canis lupus*), great Indian bustard (*Ardeotis nigriceps*) and the lesser florican (*Sypheotides indicus*) in the larger landscape.

f. Generate benefits for the local people through the development of wildlife tourism and ancillary activities.

g. Develop the capacities of the local communities to co-exist with wild animals, particularly large carnivores.

5. Project Activities

The following approaches and activities to be undertaken are proposed according to the action plan on introduction of cheetah in India based on the latest IUCN guidelines (Jhala et al. 2021), for initiating the process of establishing cheetah populations in a metapopulation framework in India.

-About 12-20 cheetahs that are ideal (reproductive age group that is genetically diverse, disease free, behaviorally sound- eg. not overly imprinted to humans but tolerant, predator wary, capable of hunting wild prey, and socially tolerant of each other) for establishing a new cheetah population in India would be imported from South Africa and Namibia, as a founder stock in early August 2022. Existing coalition of healthy wild males and females have been identified/ captured/ quarantined in the source countries. The animals' lineage and condition have been checked in the host country, to ensure that they are not from an excessively inbred stock and in the ideal age group, so as to conform to the needs of a founding population and would be translocated to India.

- The selected animals shall be collected from (different) quarantine facilities in Namibia and South Africa, as the case may be, and prepared for shipment to India, after necessary vaccinations and health checks etc, as per International protocols, and the animals shall be transported to the airlines decided by the Government of India. A veterinarian and representative(s) from the supplying agency and, project personnel from India shall accompany the shipment, along with necessary supplies and equipment.

- The cheetahs after reaching the port of entry in India will be directly transported to the quarantine enclosure in Kuno National Park either by air or by road as decided by the Government of India. The animals will be accompanied by the veterinarian(s) along with their equipment and cheetah experts as per requirement during the journey.

- The animals shall be quarantined as per the required duration as mandated by the Department of Animal Husbandry and Dairying, Government of India in the fenced (electrified) soft release enclosure constructed in Kuno NP (Area- 06 km^2 with compartments) so as to minimize their homing instinct and keep them, as far as possible, within the Protected Area. Males and females shall be kept in separate but adjoining compartments so that they are able to know each other before release. The location of the enclosure is such that the cheetahs after the quarantine period can see for some distance to understand the environment and the presence of prey, before release. The height of the fence is 2.5 metres angled both inside and outside, and multiple solar powered electric lines are fitted at various heights including the top to discourage any attempts by leopards to enter the enclosure. Adequate water and shade in the enclosure has been

augmented as needed. Natural prey within the large enclosure would ensure that cheetah become accustomed to hunting Indian prey species before their release. Additionally, the animals would be fed/ supplemented with food thrice weekly during this period if required.

- All cheetah will be radio collared with GPS-VHF collars having GSM or Satellite link before importing. The males shall be released from the holding enclosure after an appropriate period (2-12 weeks). They are expected to establish a coalition territory after exploring and investigating the available habitat, but would tend to return to the enclosure to meet the females. The presence of females in the main enclosure shall ensure that the males do not wander too far away, after their exploration instinct is satiated. Their movements shall be monitored through satellite collars on an hourly basis and ground tracking by visual observations daily by the local State Forest Department staff, assisted by project team from WII. If any animal tends to get into undesirable environment, it will be brought back. Darting will be done if essential, by qualified trained personnel. The females shall be released with radio collars, 1-4 weeks after the males, depending upon the state of the males' comfort in the new environment. The females shall be monitored and kept under observation through radio telemetry, as in the case of males described above.

- Experienced cheetah expert(s) from the source agency/country would stay at the project site, from before the arrival of the cheetah up to about two months after the release of the females from the soft release enclosure, to advise and assist in coping with any unwarranted situations, to ensure well-being of the cheetahs in soft release enclosure, opine on their readiness and that of the habitat for the release and to help monitor the animals after their release. The experts will also train the local staff.

- The response of the prey species after cheetah release shall be monitored by project team of WII to understand the new ecosystem dynamics. However, prey availability in the release sites shall also be augmented through translocation of substantial number of appropriate prey (blackbuck, chital, nilgai, etc) if required. A fully equipped animal capture team(s) will be created under the project, for this purpose. Availability of prey base shall be assessed by the WII project team and supplementation of prey will be decided on the basis of this assessment. Veterinary support created under the project will care for the release stock to manage the animals, in cases of straying, injury, conflict etc.

- All cheetah release sites shall implement MSTrIPES for patrolling and ensure appropriate staff for protection and law enforcement. Appropriate training will be imparted to the staff at the release site/ PA in these aspects by the WII project team and NTCA.

- *Monitoring & Research:*

The experimental establishment of the cheetah populations offers unique opportunity to understand the role of top predators in ecosystems. Research on all aspects of ecosystem

recovery and interactions including ecology, physiology, genetics and behaviour of the released cheetah will be addressed by project team of WII. All introduced cheetah and their F1 progeny (and if required for research some subsequent generation offspring) will be radio-collared (Satellite /GPRS /GPS /VHF). The experiment will be fully utilised to study the cheetah as a species a) its ecology with respect to ranging, habitat use, predation (Williams *et al*. 2014), interactions with co-predators; b) its behaviour with respect to intra- and inter-specific interactions, sociality, reproduction and predation strategies with respect to different prey; c) its physiology with respect to field energetics with the use of isotopes (Pagano & Williams 2019) and physiological bio-monitors (Laske *et al*. 2017). Study of prey species with respect to their behaviour especially anti-predatory strategies and demography. Appropriate collaborations with international experts are/ will be established for addressing novel modern approaches. Monitoring through telemetry of cheetah, co-predator, prey and small carnivores will be done by both the WII team for research and the Forest Department team for protection. Data between the two teams will be shared for the mutual objective of better management of the cheetah population.

- *Ecological restoration of part of Gandhi Sagar Wildlife Sanctuary by boundary fencing*

Boundary of the cheetah release site covering an area of 150 km^2 within Gandhi Sagar WLS shall be secured through proper fencing, constructed through the official channels and protocols of the State Forest Departments of Madhya Pradesh and Rajasthan to initiate ecological restoration by first controlling and reducing the intensive livestock grazing along with other anthropogenic pressures in this area. This Sanctuary is part of the proposed Interstate cheetah conservation landscape spanning an area of 4000 km^2 comprising of Gandhi Sagar WLS-Reserve forests of Neemach, Mandsaur, Divisions in MP Chittorgarh Division in Rajasthan (Jhala *et al*. 2021) Suitable fence of 2.5m height will be erected on the boundary based on the design provide by the WII in consultation with cheetah experts. The length of the boundary fence would be determined by experts of the State Forest Department and cheetah biologists. The monitoring and research on status and recovery of habitat and wildlife would be initiated by the cheetah research team of NTCA in collaboration with the State Forest Department.

6. Project Duration

This is proposed to be an ongoing activity after release of cheetahs, without an 'end-of-project' situation in sight in the foreseeable future. However, proposed activities of the project is devised, for the sake of convenience alone, for a period of one year (Table 1) which, after review, will be extended as per requirement**.**

Table 1. Timeline of the project- Bringing the cheetah back to India

Activity	2022					2023				
	Aug	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May-Jul**
Import of cheetahs to India										
Training of/ support to local staff by experts										
Release of cheetah males in Kuno National Park										
Release of cheetah females in Kuno NP										
Monitoring & research										
Monitoring co-predators and prey in Kuno NP										
Boundary fencing of part of Gandhi Sagar Wildlife Sanctuary/Nauradehi WLS										

7. Project Outcomes

Initiating the establishment of viable cheetah population(s) in India beginning at Kuno National Park along with recovery and management of grassland and open forest systems at the release site and commencing ecological restoration of Gandhi Sagar Wildlife Sanctuary. Conserving and enhancing the faunal diversity, especially the threatened and endangered species in grassland and open forest habitats by securing and consolidating these neglected ecosystems. Capacity building of State Forest Departments in wildlife and habitat management by imparting knowledge and training on latest techniques in monitoring, capture and translocation and technology enabled protection.

Revival of cheetah as apex carnivores should be seen as ecosystems conservation rather than merely as species conservation. Bringing the cheetah back to India would be reclaiming a part of India's wonderful and varied natural heritage.

8. Project Costs

A budget has been prepared for the project in consultation with International experts. Approximate cost of the project for one year is estimated to be ~ INR 30.5 crores (Rupees Thirty Crores Fifty lakhs) and is detailed as Table 3.

Table 3. Budget of the project- Bringing the cheetah back to India

Item	Unit	No.	Unit cost (INR Lakhs)	Total Cost (in INR Lakhs)	Remarks
1. International transportation of cheetah	LS	~2-5 flights		**1000.00**	Chartered cargo flights from Namibia and South Africa to India to translocate cheetahs. A dedicated flight is necessary as veterinarians need to have access to the crated cheetahs for regular health checks.
2. Fencing part of Gandhi Sagar Wildlife Sanctuary/Nauradehi WLS	LS			**1000.00**	For ecological restoration of 150 km^2 to make the site ready for cheetah release in near future. The height of the pulsating-electrified fence will be 2.5m. Fencing is most effective for recovery of the habitat as well as to secure and stabilize cheetahs initially till they establish territories and start to breed. Fencing can then be removed in parts to allow dispersal.
3. Implementation and monitoring					
3.1. Staff engagement	No.	~50		**165.00**	Veterinarians, Managers, Coordinators, Associates, Biologists, Assistants, Technicians, Drivers, Watchmen and other daily wage labour etc. totaling ~50 personnel
3.2. Field logistics					
Field vehicle purchase-4WD SUV	No.	2	40.00	80.00	Animal monitoring and transportation
Field vehicle purchase- ATV	No.	2	25.00	50.00	Animal capture and monitoring-specialized requirements of the project
Hired vehicle-4WD	No.	~3	1.00	12.00	
Fuel & operational cost of vehicles	LS			35.00	
Base camp, accommodation and	LS			20.00	

local travel					
Travel (including International) and other misc. costs	LS			45.00	
Unforeseen contingencies (including medical, insurance etc.)	LS			15.00	
Sub-total (Field logistics)				**247.00**	

Item	**Unit**	**No.**	**Unit cost (INR Lakhs)**	**Total Cost**	**Remarks**
3. Implementation and monitoring					
3.3. Field equipment					
Radio collars and biotelemetry, accessories	No.	40	4	160.00	Monitoring co-predators, prey and small carnivores' dynamics and interactions with cheetah
Misc. capture equipment and tools, winches, and implements	LS			30.00	
Veterinary equipment, computers and consumables	LS			60.00	
Operational costs of animal capture (labour, POL, misc.)	LS			45.00	
Capture, restraint and tranquilisation, equipment, drugs, isotopes, molecular genetics, related and other consumables	LS			85.00	
Binoculars, camera traps, GPS, Computers, cameras, survey equipment, batteries, stationary, etc.	LS			100.00	

Sub-total (Field equipment)				**480.00**	
3.4. Consultancy for International/ National experts	LS			**15.00**	
Total				**2997.70**	
4. Institutional charges	LS			**145.35**	5% of the total amount
Grand total				**3052.35**	

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