
NAGARJUNA SAGAR-SRISAILAM TIGER RESERVE (NSTR), INDIA

AN UPDATE

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Image 1. The author with a friend, Malleswari, in the Chenchu village of Chinthala.

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Background

Nagarjuna Sagar-Srisailem Tiger Reserve (NSTR: 15 53' N – 16 43' N and 78 30' E – 79 28' E) is a massive stretch of forest located in the south Indian state of Andhra Pradesh. Part of the Nallamalai hill range, the Reserve spans an area of 3,568 km² (Core 1200 km²) and was declared as a protected area in 1978, becoming a Project Tiger site in 1983. Today, NSTR remains one of the largest Project Tiger sites in India and the only one in Andhra Pradesh.

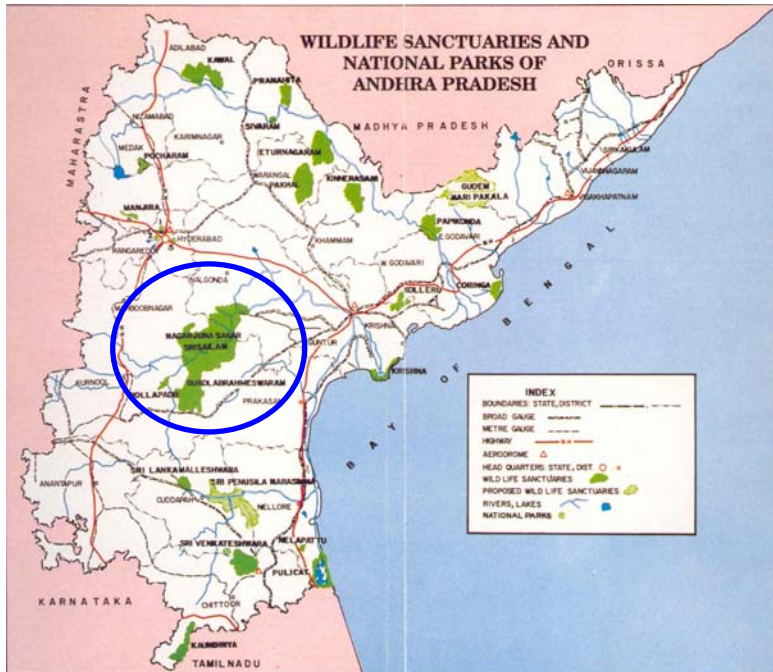


Image 2. Andhra Pradesh (South India) with NSTR circled

Summary of Previous Work

Under a Save the Tiger Fund grant during 1998-1999, I conducted a preliminary survey of tiger ecology in selected habitats in the Southern Bank of the Reserve. This work identified several major “tiger trails” which also connected tribal Chenchu villages, allowing us to predict areas of human-wild carnivore conflict and to focus the Forest Department’s compensation efforts. Our camera traps also captured the first photographs of wild tigers in the reserve. The main threats to the park were habitat disturbance and degradation by domestic livestock and a scarcity of water supply. A proposed tunnel project, the Veligonda tunnel project, also threatened to have a major detrimental impact on the sanctuary. While hunting and pre-meditated poaching of tigers were virtually unheard of, the study did document a few instances of opportunistic poisoning of tiger kills.

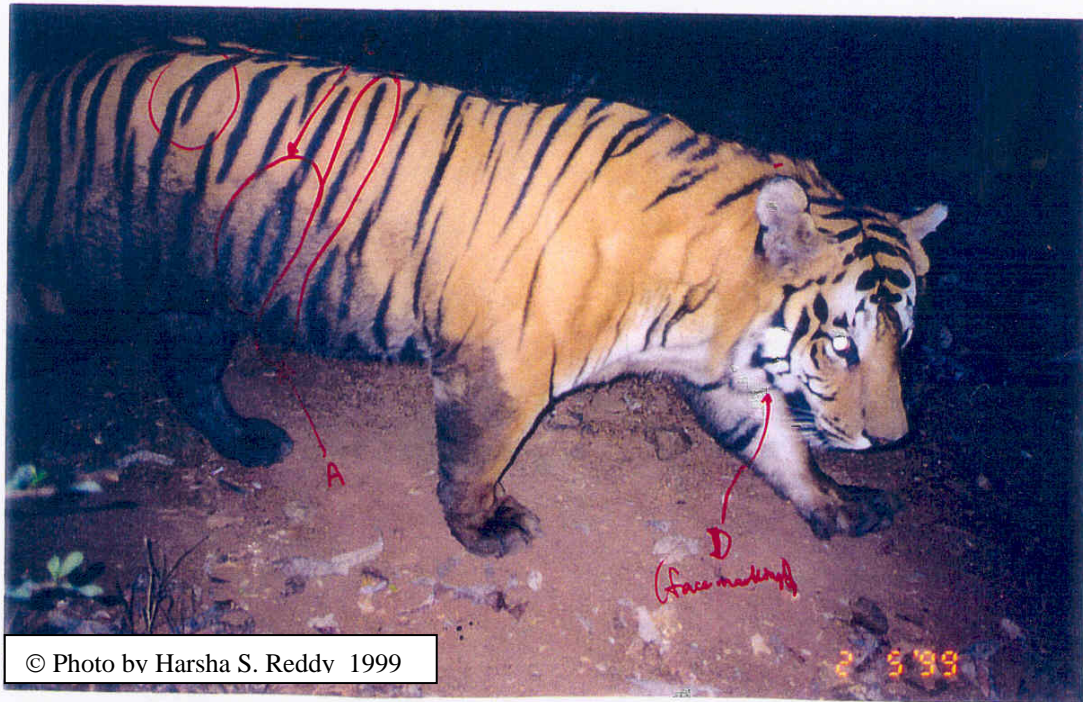


Photo 2 Peccheruvu – Yerragadda road (under power line). February 3, 1999. 8:30 PM
Heading South-Southwest towards village

Image 3. First photograph of tiger in NSTR

In 1998, the research infrastructure at NSTR was in its formative stages. The Assistant Chief Conservator of Forests (NSTR), Mr. K. Thulsi Rao, already recognized for his leadership in implementing Eco-Development in NSTR had written an excellent management for making field research and scientifically-based management a part of the Reserve’s future. Simultaneously, Dr. C. Srinivasulu had conducted some preliminary biodiversity surveys of the Nallamalas while doing his doctoral research as part of the Osmania University (Hyderabad) Wildlife Biology Section under the guidance of Dr. V. Nagulu.

Ecological Status of NSTR (General Comments)

I recently revisited NSTR for two weeks during March of 2003, and my brief trip was inadequate to make any major claims on the overall status of the park or the tiger population in particular. One major piece of good news, however, was the routing of the Veligonda Tunnel Project around the sanctuary. Had this not happened, the status of the sanctuary itself may have been in danger. Regarding the influence of paramilitary anti-government extremists in the park, the reports are mixed, as before. The police presence is certainly felt in the reserve, but the situation is nowhere near the crisis levels of the early 1990’s. Livestock presence and water scarcity continue to be major threats, and there seems to have been no

increase in wildlife poaching. The Eco-Development Program, after a brief period of inactivity, has resumed once more in the past year. The Eco-Development Committees (EDC's) in the major villages are now solidly established and are beginning to enforce various community-level programs such as checkdam construction and creation of regulated minor forest produce collectives.

Status of Research in NSTR

I was very pleasantly surprised to see that the research infrastructure has developed significantly over the past four years. This is due to great efforts and collaboration by the Forest Department and academically-trained wildlife researchers. Mr. Thulsi Rao and Dr. Srinivasulu continue to play a major role in this progress. I will briefly present the major research developments in the reserve here:

1. Eco-Research and Monitoring (ERM) Lab

This facility, opened in December 2001, has the following resources:

- Fulltime staffmembers – UmaMaheswar Rao (Social Scientist), I.SivaRamakrishna (Project Assistant), S.M.M.Javed (Wildlife management), Madhusudhan Reddy (Computer specialist)
- State of the art computer facilities - including GIS software which allows incorporation of satellite imaging of vegetation, rainfall etc. on to topographical maps; internet connection; standard data analysis, graphics, word processing software.
- Biodiversity specimen collection – a wide range of invertebrate and vertebrate specimens collected as part of All-Taxa Biodiversity Inventory (ATBI: see below).
- This lab works in close collaboration with specialized field researchers from academic institutions. For example, Dr. Srinivasulu, currently studying bats in South India, helped to train the staff in taking anatomical measurements for species identification, and together they were able to identify a rare bat species with only one record from all of India.



Image 4: Eco-Research Monitoring Lab, est. 2001



Image 5 : Computer facilities in the ERM office with satellite maps overhead (Forest Dept staffmember Madhusudhan Reddy)



Image 6 : Mr. K. Thulsi Rao (ACF, Project Tiger) giving a tour of the ERM's specimens to NGO leaders from Hyderabad.



Image 7 : Pugmark casts from the previous tiger census collected in the ERM Labs

2. Eco Van

- A large van that has major themes of conservation painted on the outside as well as a series of 16 individual dioramas. These scenes illustrate concepts such as the evolution of man and the dangers of deforestation. The visual aspect of this education is critical in communicating with illiterate populations.



Image 8 : Outside of Eco Van (with long-time Department staff member Subbha Reddy)



Image 9 : One of the 16 dioramas inside the van. (This one depicts the wasteland Earth could become if we don't wisely use natural resources).

3. All-Taxa Biodiversity Inventory

- This was a major effort to take an inventory of the invertebrate and vertebrate animal life in the reserve. Photographs were taken by digital camera of all species found and specimens were collected when possible. Subsequently, experts from wildlife institutions throughout India were consulted for the identification of difficult species.
- Two botanists from a local university (sorry, I don't have their names) were also critical in identifying medicinal plants found in the sanctuary. The Chenchus were also interviewed in this process and the uses, beliefs, and vernacular names for these species were also recorded.

<i>Catunaregam uliginosa</i> (Retz.)Sivarajan		
Family	: Rubiaceae	
Local name	: Manga	
Habit	: Spiny small tree	
Uses	: Dandruff	
Part used	: Fruits	
Mode of Application : : Fruit Power used as Head bath		
<ul style="list-style-type: none"> ☞ Small Trees of 5 meters ☞ Branches ending in pair of thorns ☞ Leaves elliptic – ovate ☞ Flowers white ☞ Drupes ellipsoid 		
STATUS		: Rare
FLOWERING & FRUITING		: March to November
© K. Thulsi Rao (AP Forest Dept), 2002		

Image 10 – Representative medicinal plant slide from ATBI. All work done under supervision of Mr. K. Thulsi Rao (ACF, Project Tiger, NSTR)


Actias selene
Indian Moon Moth

No. Sighted : 2

Collected : 2

Date : 20.10.02

Locality :
ERM - Labs.
F: Saturniidae



❖ Large, with a wingspan of 80-120 mm, it is often described, not unreasonably, as one of the most beautiful of all moths.

❖ When newly-emerged it is a lovely pale emerald green, with yellow lines and a bi-colored eyespot on each wing.

❖ Perhaps the most distinctive feature is its shape, the hindwings being curved and prolonged into long narrow 'tails'.

❖ As with most moths, the antennae of the male are much longer than those of the female.

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Image 11 – Representative invertebrate diversity slide from ATBI. All work done under supervision of Mr. K. Thulsi Rao (ACF, Project Tiger, NSTR). © K.Thulsi Rao, 2002.

4. Environmental Education Center

- This facility, which was already fully operational in 1998, educates visitors about the park's history and wildlife in the reserve. The center also features photos, displays, and taxidermied specimens. Wildlife videos are also periodically screened.
- An enclosure adjacent to the center houses rescued chital (spotted deer). Visitors can observe these animals from a respectful distance.



Image 12 – Environmental Education Center (Project Tiger complex)



Image 13 – Closeup of taxidermied tiger in the EEC

Tiger Research and Conservation

The resources described above have yet to be used for specific field research on tiger ecology, but there is tremendous potential for such work in the future. With wireless technology now available in the Srisaillam area, GPS locators, and existing satellite maps, tiger monitoring can be conducted efficiently, scientifically, and in a coordinated manner for the first time in NSTR. However, these efforts require that

a human infrastructure for field research be developed. Currently, both Forest Department field staff and officers are occupied with routine patrolling and eco-development activities, so neither people nor vehicles can be spared for tiger monitoring work per se. Dedicated officers and field staff must be relieved from other duties and be given the time and means to focus on specific wildlife research projects.

Outside researchers must be integrally involved without unreasonable restrictions placed on their activities. They bring not only their scientific expertise but also a new perspective and fresh ideas to management. Their funding must be sufficient to plan for long-term studies (5-10 years rather than 1-2) and must be independent from the Forest Department. A model of semi-autonomous collaboration between the Forest Department and outside researchers is slowly developing and must be encouraged further. On the whole, NSTR is a much more research-friendly place today than it was in 1998.

In the near future, NSTR would be a great site for Ph.D. or post-doctoral student(s) to conduct a tiger ecology study that could lay the foundation for a long-term project. Ideally, this would be a collaboration between U.S. and Indian scholars/universities. Similarly, promising young wildlife scholars and Forest Department officers from India could be sent on 'fellowships' for advanced training to other reserves that have established tiger research programs or to American universities for new skill sets.

Of the 4 states in South India, Andhra Pradesh has the least wildlife research human infrastructure. By means of comparison, there is tremendous ongoing work in Kerala (Periyar Tiger Reserve), Karnataka (Bandipur and Nagarhole) and Tamil Nadu (Mudumulai Wildlife Sanctuary). NSTR is a good place to start to develop such resources in Andhra Pradesh. It is important that people working towards conservation in the state don't feel that they are working in isolation. NSTR would benefit from the affirmation, the new ideas, and the resources that come with international collaboration.

People of Conservation in NSTR



Image 14. (From l-r): Mr. K. Thulsi Rao (Assistant Conservator of Forests-Biodiversity, Project Tiger, NSTR), I Sivaramakrishna, SM Javed (ERM Project Assistants).



Image 15. (From l-r). Dr. C. Srinivasulu (Ph.D., Osmania University), Dr. Bhargavi Srinivasulu (Ph.D., Osmania University), and budding wildlifer, son Aditya.

Contact Information

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CURRENT RESEARCH INTERESTS: Bat ecology in South India, Chital population dynamics

NOTE: CSIR = Council for Scientific and Industrial Research, New Delhi. A major post-doctoral funding source.

Representative Nallamala bibliography

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The Chenchus: Homecoming, Much More to be Done

Finally, any long-term management solution in the Reserve must be sensitive to and seek the involvement of the local tribal population of the forest, the Chenchus. Few stereotypes apply to the society as a whole. They have their social and individual ills, but they are also among the most generous and intelligent

people I have ever met. Returning to these villages where I lived for over a year and seeing old friends was a true joy.

Yet, having nearly completed my medical training in the interval, this time I was also aware of the shocking state of health among the Chenchus. While no systematic survey has been done, indicators of health status are alarming. In particular, rates of malnutrition and infectious disease (including HIV and TB) are very high per reports of local medical personnel and the Chenchus themselves. Interventions designed to promote healthy ecosystems must be intertwined with the promotion of human health in this vulnerable population. Long-term goals, in which I hope to be involved, are a systematic health survey (including focus on eye disease) and the establishment of a health care initiative to better channel needy patients to available services.

These final photos aim to show the Chenchus not merely as ‘a population’ to help or to collaborate with but as individual human beings with whom to relate.

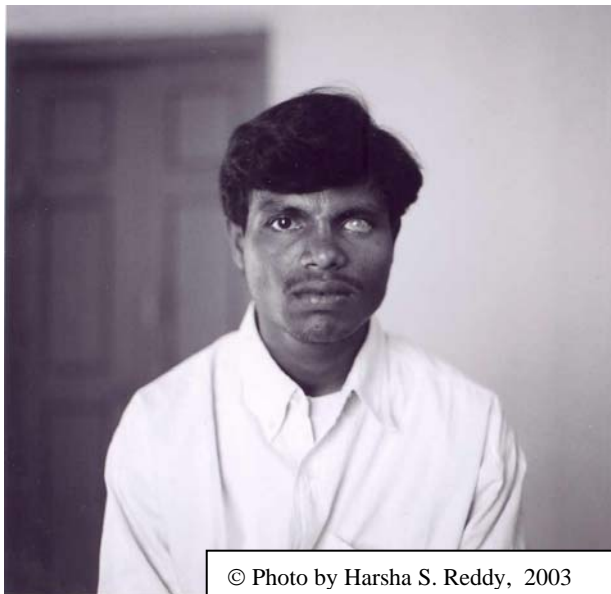


Image 16. Potaraju (of Peddacheruvu). His left eye has an adherent leukoma, a type of fibrous scar tissue, which he first developed in childhood. It will require a surgical therapy called a penetrating keratoplasty in which a cadaveric cornea is transplanted onto his diseased cornea.



© Photo by Harsha S. Reddy, 2003

Image 17. Mallikarjuna and his younger brother. The two are orphans recently ‘adopted’ by the tribal school at Chinthala. The younger child has a neurological disease of unknown type with hydrocephalus, low muscle tone, and severe developmental delay. Mallikarjuna takes care of feeding, bathing, and literally holding up his younger brother.



© Photo by Harsha S. Reddy, 2003

Image 18.

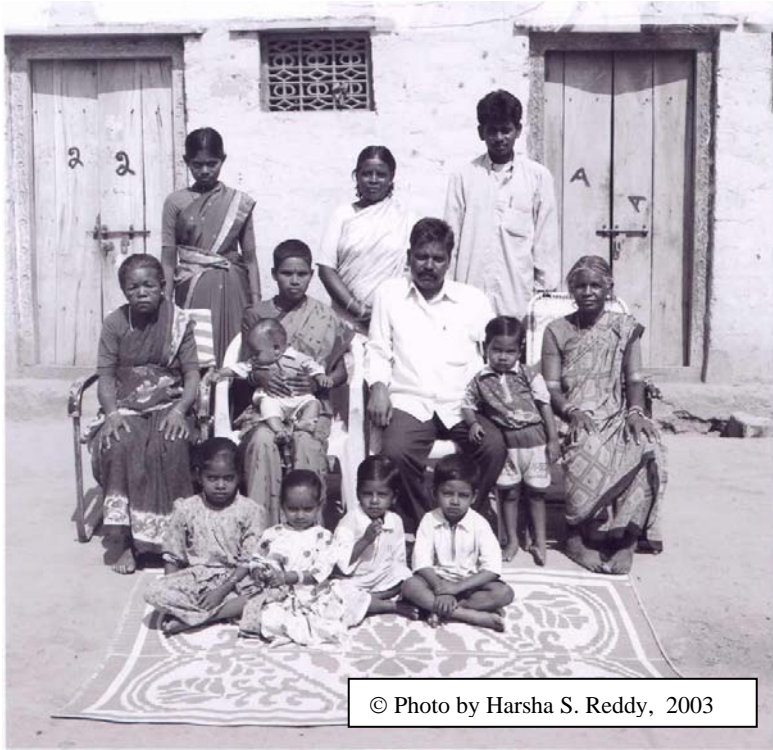


Image 19. One of several family portraits I was requested to take