TIGER CONSERVATION PLAN
NAGARJUNASAGAR SRISAILAM TIGER RESERVE
(2023-24 to 2032-33)

VOLUME I
CORE AREA



ANDHRA PRADESH FOREST DEPARTMENT

GOVERNMENT OF ANDHRA PRADESH

TIGER CONSERVATION PLAN
NAGARJUNASAGAR SRISAILAM TIGER RESERVE
(2023-24 to 2032-33)

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FOREWORD

The Nagarjuna Sagar Srisailam Tiger Reserve (NSTR), one of India's premier tiger conservation areas, is proud to present its Tiger Conservation Plan (TCP) for 2023-24 to 2032-33. This plan embodies our commitment to conserving the entire biodiversity of the landscape, with tiger as an umbrella species.

The TCP outlines a comprehensive approach to protect and manage Core/Critical Tiger Habitat, management of Buffer zone, Conservation of corridors for tiger movement and genetic exchange, Enhance tiger populations within and beyond protected areas.

Our goal is to ensure a thriving tiger population, coexisting with local communities, while maintaining ecological balance. This plan is a roadmap for stakeholders, including government agencies, conservation organizations, and local communities, to work together towards a common conservation objective.

I am confident that this TCP will guide NSTR's conservation efforts, contributing to Andhra Pradesh's and India's tiger conservation goals.

I compliment the entire officers & staff of Project Tiger, Nagarjunasagar Srisailam Tiger Reserve for bringing out well written Tiger Conservation Plan.

Dr. P.V. Chalapathi Rao, IFS.,

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Abbreviations

ABO	Assistant Beat Officer
AC	Acres
ACF	Assistant Conservator of Forests
APCCF	Additional Principal Chief Conservator of Forests
CA	Compensatory Afforestation
CAMPA	Compensatory Afforestation fund Management and Planning Authority
CCF	Chief Conservator of Forests
CF	Conservator of Forests
DCF	Deputy Conservator of Forests
DD	Deputy Director
DPAP	Drought Prone Areas Programme
DyRO	Deputy Range Officer
EC	Environmental Clearance
EEC	Environment Education Centre
ESZ	Eco-Sensitive Zone
EMC	Environment Maintenance Charges
FBO	Forest Beat Officer
FC	Forest Clearance
FCA	Forest Conservation Act
FD	Field Director
FRA	Forest Rights Act
FRH	Forest Rest House
FRO	Forest Range Officer
FSI	Forest Survey of India
GIS	Geographic Information System
GPS	Global Positioning System
GBM	Gundla Brahmeshwaram Wildlife Sanctuary
GC	Green Cess
HoD	Head of Department
HoFF	Head of Forest Force
IUCN	International Union for Conservation of Nature
JFM	Joint Forest Management
MoEF & CC	Ministry of Environment, Forest & Climate Change
MoU	Memorandum of Understanding
MM	Millimetres
MSL	Mean Sea Level
NHAI	National Highway Authority of India
NSTR	Nagarjuna Sagar Srisailam Tiger Reserve
PA	Protected Area
PCCF	Principal Chief Conservator of Forests
PF	Protected Forests
RF	Reserved Forests
RoFR	Recognition of Forest Rights
SFDs	State Forest Departments
SFM	Sustainable Forest Management
SOI	Survey of India
SRBC	Srisailam Right Bank Canal
STFP	Special Tiger Protection Force
TCP	Tiger Conservation Plan
WII	Wildlife Institute of India
WWF	World Wildlife Fund
WLS	Wildlife Sanctuary
MP	Management Plan
ZI	Zone of Influence

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Chief Conservator of Forests & Field Director,
NSTR, Project Tiger Circle, Nandyal.

EXECUTIVE SUMMARY

The Management Plan is for a period of 10 years from 2023-24 to 2032-33. It is with a deep sense of responsibility and urgency that I present this comprehensive Tiger Conservation Plan for the period 2023-24 to 2032-33. The purpose of this plan is to address the long-term conservation of tiger populations and their habitats and to outline a strategic framework for their conservation and sustainable management. It is against this backdrop that, we have formulated this ten-year (10) Tiger Conservation Plan. This plan is designed to address the multifaceted challenges faced by tigers and their habitats through a holistic and collaborative approach. It outlines a set of ambitious, yet attainable goals, strategies, and actions aimed at ensuring the survival and recovery of tiger populations across NSTR and the larger Eastern Ghats Landscape. This is the fourth Tiger Conservation Plan that is being prepared for NSTR and its surrounding areas.

The vision of the plan is "to enhance the protection of tigers in their natural habitat in perpetuity and earmark inviolate & undisturbed spaces for their healthy existence."

Given the fact that tiger numbers are on the rise, special and a more detailed strategy has been formulated towards dispersing tigers into buffer and corridor area. The specific strategy in this regard has been formulated in Volume II & Volume III. This has been made with an intention to focus on tiger conservation in the future. For a more systematic approach, the plan has been divided into ten (10) theme plans and (2) zone plans. Each of which addresses a specific management aspect. A self-analysis of the Tiger Reserve has also been done using SWOT analysis.

The plan emphasizes the need for habitat protection and restoration, strict anti-poaching measures, and robust community engagement. It also underscores the importance of addressing Human-Wildlife Conflict through innovative and sustainable

solutions, recognizing the rights and needs of local communities while ensuring the safety of both humans and tigers. Special focus is driven towards addressing anthropogenic pressure from pilgrims to Srisailam by introducing the concept of "Green Pilgrimage", which focuses on studying the impact on wildlife, strategies to minimize impact and find a long-term solution to this ever-increasing threat. Apart from this, a detailed fire management plan has also been formulated to ensure protection of habitat and micro-fauna.

As part of habitat improvement theme, measures such as Water Resource Management, Grassland improvement zone, reducing the presence of human impacts have been proposed in the Plan. As a measure to augment prey base and ensure increase in animal numbers, various protection, re-introduction and *in-situ* re-wildling plans have been proposed. Some of the key measures include safeguarding wildlife on highways, a detailed anti-poaching strategy, and reintroduction of key herbivore species like Indian Gaur. A detailed and elaborate strategy along with the proposed release site and justification have been provided in the plan. Herbivore enclosures are also proposed to augment/supplement prey base in NSTR. Wildlife Health is another key aspect; wherein the already existing facilities and staff will be improved upon. Modern equipment and medication facilities are proposed to be acquired to ensure a quick and self-sustainable facility. The plan also proposes setting up elephant camps. The infrastructure for the same and the reason for it has also been incorporated in the plan and it is proposed to be executed during this period.

Wildlife conservation and habitat improvement is our primary focus for increasing wildlife density in NSTR. We also wish to improve the eco-tourism/Safari facilities in the core area of NSTR without having any impact or least impact. The existing facilities

will be improved and measures will be taken to operate eco-tourism well below the carrying capacity. A strategy in this regard has been detailed in the Eco-tourism theme plan.

The plan also has a strategy for a broader goal of addressing climate change. This starts with assessing the various climate variables and undertake research on quantifying the same. Measures for a positive change have also been proposed in the form of habitat restoration, changing land use and creating awareness on the same. Apart from the larger objective of climate change the monitoring and research aspect of the plan is elaborated in great detail. The protocol of NTCA from Phase I to Phase IV are mentioned. Apart from that, yearly monitoring and research of tiger, co-predators and prey have been detailed, involving capture-recapture using camera trapping, line transect survey for animal density and indirect sign surveys for habitat usage. The Reserve believes in a scientifically robust approach towards conservation of wildlife and its habitat.

The plan emphasizes the aspect of continuous improvement and trained staff numbers. Training and capacity building workshops have been proposed periodically for the staff on aspects on enforcement, monitoring and research.

The success of this Tiger Conservation Plan relies on the collaborative efforts of Andhra Pradesh Forest Department, other government depts, conservation organizations/ partners, local communities and concerned citizens. It calls for a collective commitment to support and implement conservation actions that prioritize the long-term survival of tigers and the ecological integrity of their habitats.

TIGER CONSERVATION PLAN: CORE AREA
PART A: THE EXISTING SITUATION



GENERAL INTRODUCTION
NAGARJUNASAGAR SRISAILAM TIGER RESERVE



I. INTRODUCTION OF THE AREA

- The Nallamala Forests are the largest stretch of undisturbed forest in South India apart from the Western Ghats which have a viable tiger population comprising of tropical dry deciduous forests.
- The Reserve is strategically located in Central India and is connected in South to the Seshachalam hill ranges and in the Northwest and Northeast side to Amrabad Tiger Reserve.
- The habitat of NSTR is highly productive in context of tiger and due to a high turnover, there is movement of tiger to outer areas with several “sink population” thriving in the adjoining forests of Nandyal, Cuddapah, Nellore, Annamaiah and Tirupathi Districts.
- Providing ecologically viable sustainable livelihood options to local population and fostering district level welfare schemes in the Buffer area is important, besides day-to-day monitoring of tiger and addressing human-tiger conflicts.

- Restoring the corridor connections with Seshachalam hill ranges passing through Nallamalais, Kancherlamorum, Lankamalas, Veligondas and Palakondas is important for the long-term viability on the NSTR tiger populations.

A. Description of the Tiger Conservation Unit/ Landscape and Significance of the area for Tiger Conservation:

The Project Tiger guidelines made it mandatory that every Tiger Reserve should be managed in accordance with a site-specific Management Plan, which is the road map for managing a Tiger Reserve. Project Tiger thus became a role model for scientific management of Protected Areas in India. It laid down the concept of Core-Buffer zonation, prescribed interventions for protection, habitat improvement, field data collection relating to change in the composition of flora and fauna on account of protection, animal estimation and other aspects.

After reorganization of Andhra Pradesh the Nagarjunasagar Srisailam Tiger Reserve (NSTR) is divided into 2 halves and this plan pertains to the state of Andhra Pradesh. The Tiger Conservation Plan for Nagarjunasagar Srisailam Tiger Reserve (hereafter referred as NSTR) covers an area of 5442.83Sq.Km.. The area includes the Rajiv Gandhi Wildlife Sanctuary and Gundla Brahemswaram Wildlife Sanctuary areas. Consequent to the amendment to Wildlife (Protection) Act, 1972 in 2006, the National Tiger Conservation Authority, Ministry of Environment, Forest & Climate Change, Govt. of India have issued detailed guidelines for preparation of Tiger Conservation Plan. Based on these guidelines, this Tiger Conservation Plan covers an area of 5442.83Sq.km which includes Core area of 2908.36 sq. km and the buffer area of 2534.47 Sq.km. NSTR is one of the major Protected Areas of the state consisting of sizeable number of Tigers. The whole area of Wildlife Sanctuaries of Rajiv Gandhi & Gundla Brahmeswaram has been declared as Core. The Tigers in this area would serve as ‘source population’, which needs to be consolidated and strengthened by suitable management interventions. The Buffer/peripheral areas are Tiger bearing forests, having potential for further consolidation. These areas are required to provide habitat supplement to the spillover population of Tiger and its prey from the Core area, to provide site specific, need based, participatory eco development inputs to local stakeholders for rationalizing their resource dependency on Tiger Reserve and mainstreaming of wildlife concerns in various production sectors in the area. The adjoining landscape is required to maintain connectivity to other Core areas for

ensuring gene flow as an ecological requirement for long term survival of the species. Adjoining landscape may also act as smaller source population by facilitating breeding and movement of native wildlife population to colonize adjoining habitats.

After bifurcation of State the Nagarjunasagar Srisailam Tiger Reserve areas of residual Andhra Pradesh has to be re-notified to have legal status of the Nagarjunasagar Srisailam Tiger Reserve of Andhra Pradesh as was done in respect of Telangana State where the residual areas of NSTR have been re-notified as Amrabad Tiger Reserve.

The Core of NSTR is spread over an area of 2908.36 Sq.kms. The geographical situation is between East $16^0$35'5.64" N, $79^0$28'27.53" E, West: $15^0$58'16.35" N, $78^0$36'5.85" E, North: $16^0$37'6.61" N, $79^0$27'5.69" E, South: $15^0$23'48.22" N, $78^0$49'38.28" E latitude and longitude respectively.

The buffer of NSTR is spread over an area of 2534.47 Sq. Kms. The geographical situation is between East: $16^0$16'50.24" N, $79^0$33'27.65" E, West: $16^0$1'20.61" N, $78^0$20'7.60" E, North: $16^0$33'2.73" N, $79^0$18'34.09" E, South: $15^0$10'48.30" N, $78^0$41'31.81" E latitude and longitude respectively.

Accordingly, the notification proposals of NSTR Core & Buffer has been submitted to the Government vide Prl. CCF (WL) & CWLW, A.P., Mangalagiri Rc.no.3030/2023/WL-2 Dated 05.07.2023.

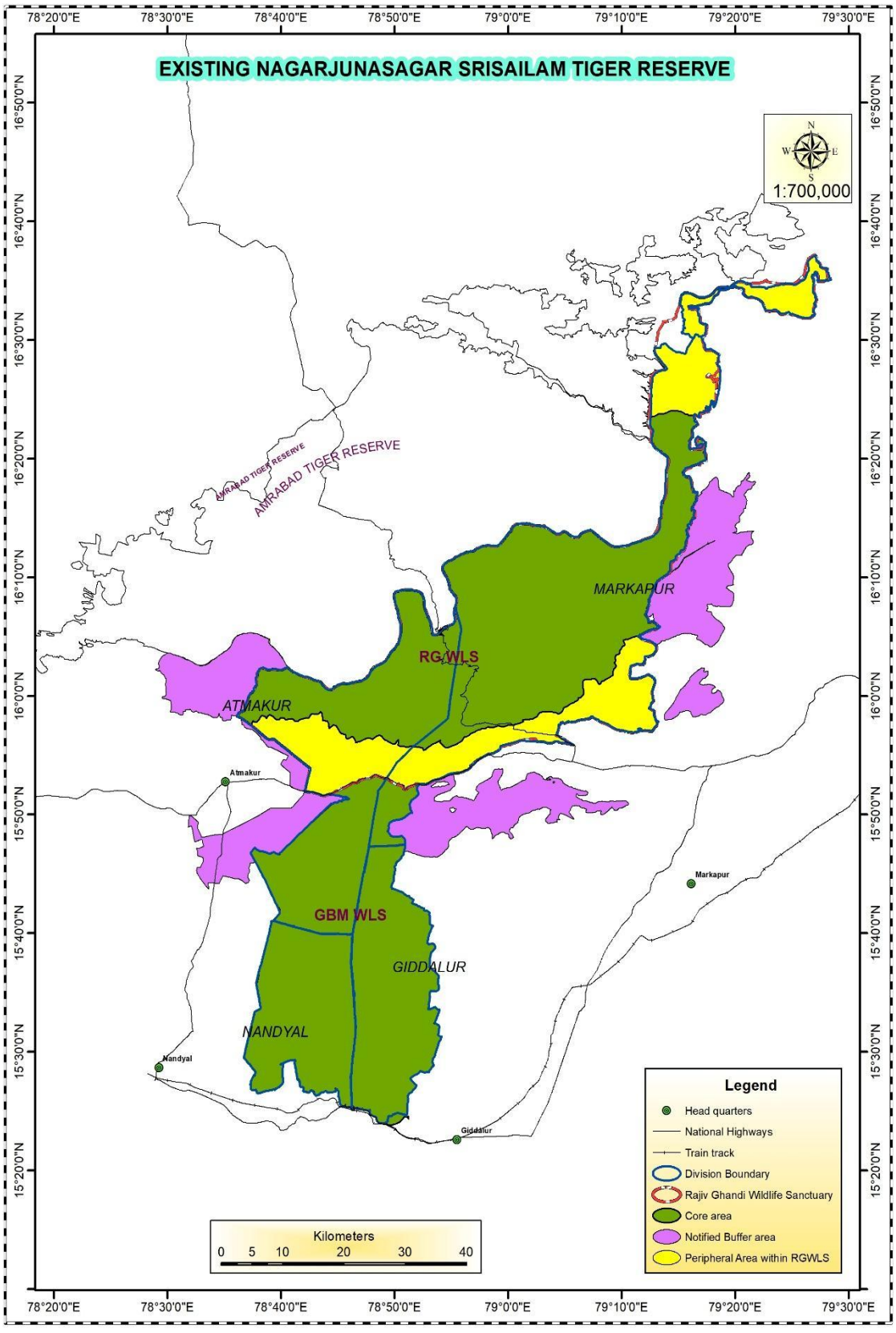
B. Delineation of Area into Core and Buffer

The total area proposed for notification is 5442.83 Km^2. The extract of core area and buffer area are as follows: -

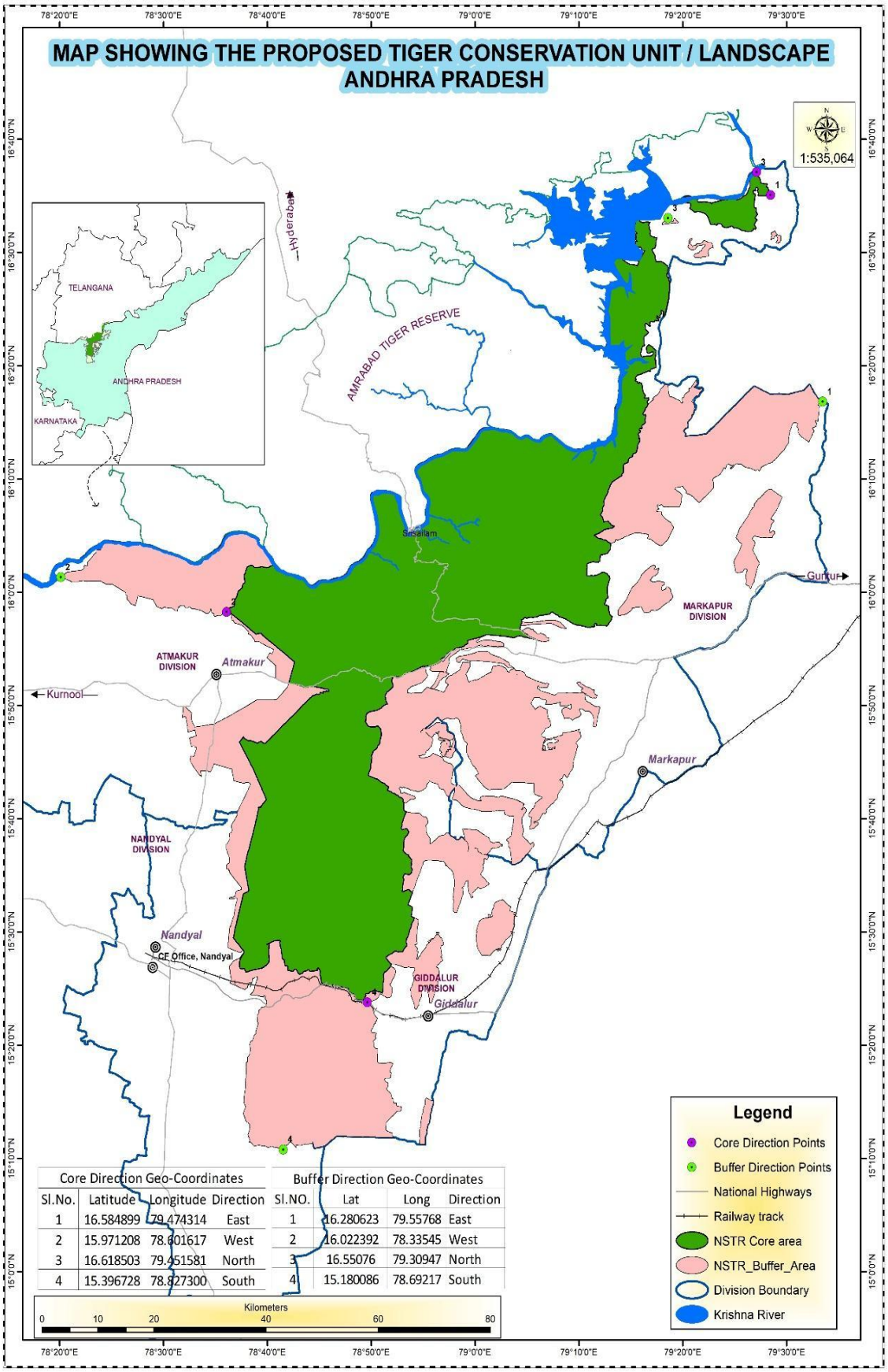
Table: -1 Extract of Core area and Buffer area of NSTR

Sl. No	Division	Proposed NSTR Area (Sq. km)		
		Core	Buffer	Total (3+4)
1	2	3	4	5
1	PT Markapur	1315.98	1063.27	2379.25
2	PT Atmakur	783.86	464.85	1248.71
3	PT Giddalur	390.23	614.33	1004.56
4	PT Nandyal	418.29	392.01	810.3
	Total	**2908.36**	**2534.47**	**5442.83**

Map-1: Showing the Existing Nagarjunasagar Srisailam Tiger Reserve



Map- 2: Showing the Proposed Tiger Conservation Unit / Landscape



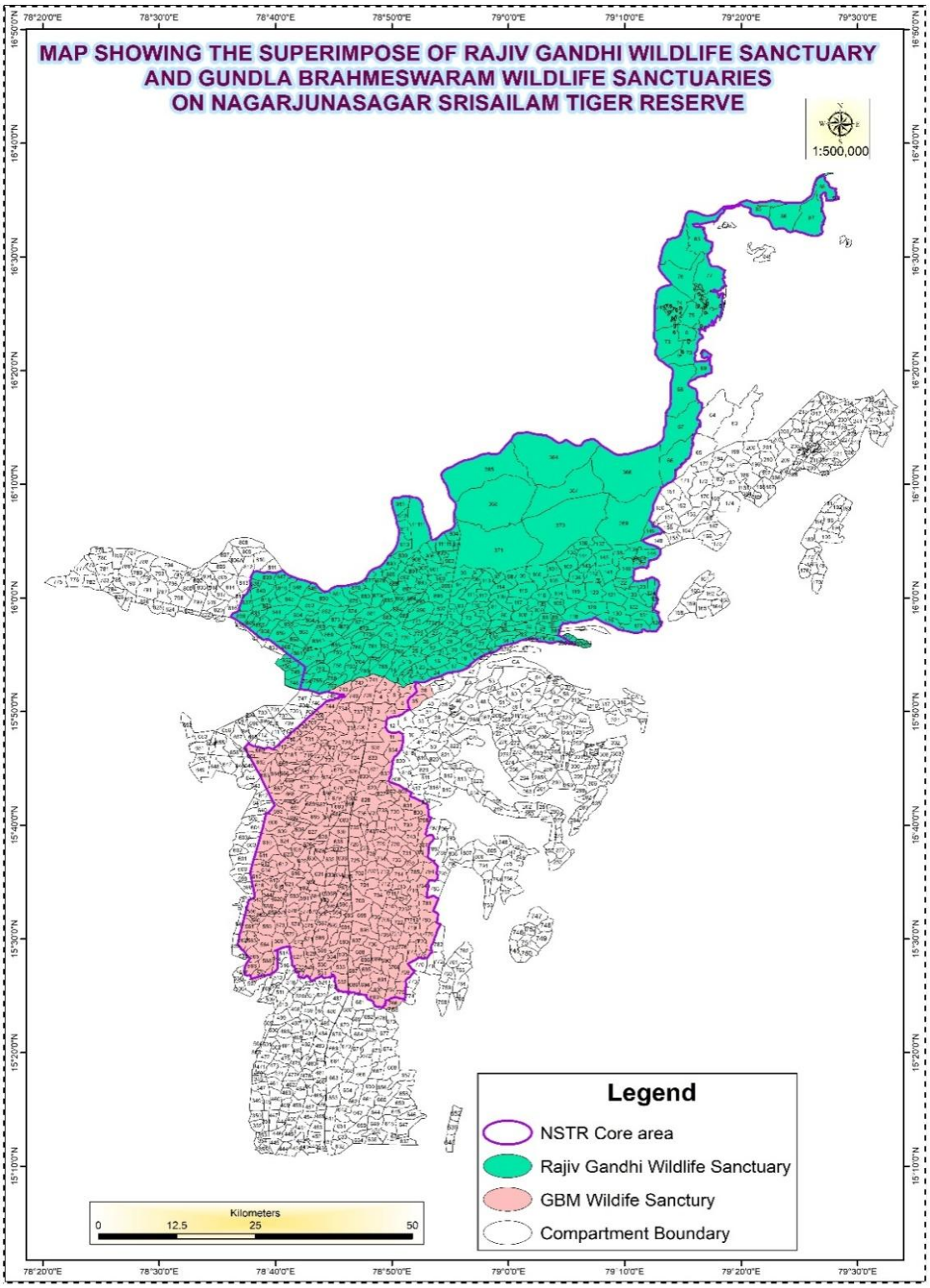
Core Direction Geo-Coordinates

Sl.No.	Latitude	Longitude	Direction
1	16.584899	79.474314	East
2	15.971208	78.601617	West
3	16.618503	79.451581	North
4	15.396728	78.827300	South

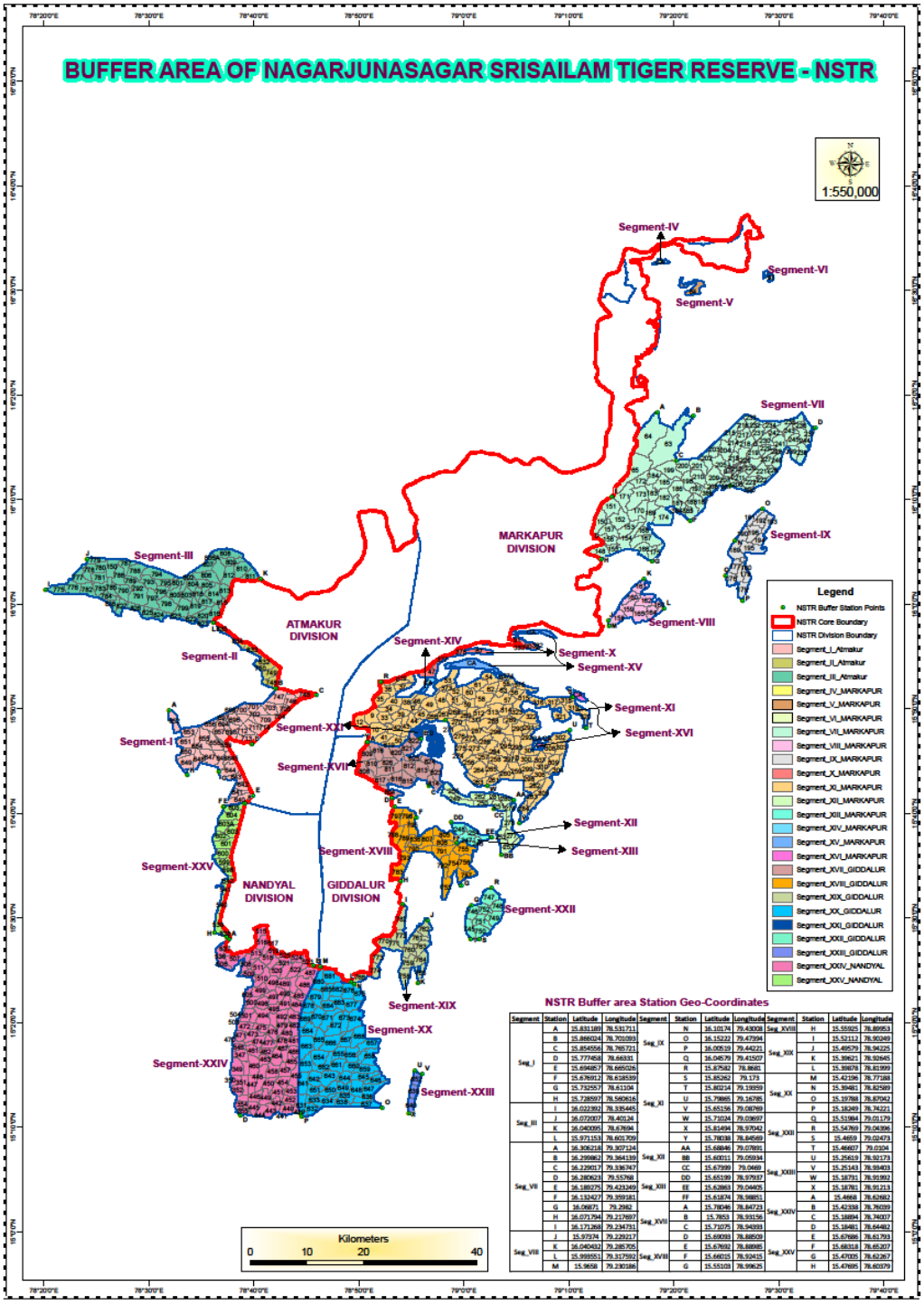
Buffer Direction Geo-Coordinates

Sl.NO.	Lat	Long	Direction
1	16.280623	79.55768	East
2	16.022392	78.33545	West
3	16.55076	79.30947	North
4	15.180086	78.69217	South

Map: -3 Showing the Superimpose of Rajiv Gandhi Wildlife Sanctuary and Gundla Brahmeswaram Wildlife Sanctuaries of NSTR



Map:4 Showing the Buffer Area of NSTR



Legal provisions contained in The Wildlife (Protection) Act regarding Tiger Conservation Plan And brief description of their relevance in The Tiger Conservation Unit/ Landscape:

The Wildlife (Protection) Act, 1972 was amended in 2006, and in 2022. (N0.18 of 2022) A separate Chapter (IVB) was added on the "National Tiger Conservation Authority" which implements the Centrally Sponsored Scheme (CSS) of Project Tiger. This Chapter, inter alia, has enabling provisions (Section 38V) for preparing a "Tiger Conservation Plan" for the proper management of a Tiger Reserve, which shall also include staff development and deployment plan. The Core or Critical Tiger Habitat is required to be kept as inviolate for the purpose of Tiger Conservation. The Buffer or area peripheral to Critical Tiger Habitat is required to ensure the integrity of the Critical Tiger Habitat with adequate dispersal for Tiger species and to promote co-existence between wildlife and human activity with due recognition of the livelihood, developmental, social and cultural rights of the local people. The adjoining landscape is required to act as corridor for movements of wild animals between Core areas.

E. Adjoining Landscape:

The NSTR has connectivity on the Northern and Southern sides. The North Western to North Eastern side connects it to Amrabad Tiger Reserve of Telangana State, having good population of Tigers, and the Southern side connects it to Seshachalam hills enroute Nallamala, Kancherlamorum, Lankamalais, Veligondas and Palakonda hill ranges. The corridor includes other Protected Areas of Lankamalleswara and Penusula Wildlife Sanctuaries. The Nandyal, Cuddapah, Nellore, Annamayya and Tirupathi Divisions have been included as adjoining landscape.

APPROACH TO TIGER CONSERVATION PLAN:

Owing to habitat fragmentation on account of biotic pressures and ecologically unsustainable land uses, coupled with poaching pressures, it is imperative in the context of tiger conservation planning to 1. Consolidate and strengthen the "source population" in the tiger reserve and protected areas 2. Manage "source sink dynamics" by restoring the habitat connectivity to facilitate dispersing tigers to repopulate the core areas. The management plan is drafted keeping this strategy in view.

CHAPTER – I:
Introduction of the Area



Tiger at a waterhole in NSTR

1.1. NAME, LOCATION, CONSTITUTION AND EXTENT

1.1.1. NAME:

The reserve is called as "Nagarjunasagar Srisailam Tiger Reserve" (NSTR) situated in the Nallamala, which is an offshoot of Southern Eastern Ghats of Andhra Pradesh. Nagarjunasagar Srisailam Tiger Reserve was notified by the erstwhile State of Andhra Pradesh vide G.O. Ms. No.66 F & RD for (iii) Dept. dated 25th February 1983 after obtaining in principle approval from Government of India vide Letter No. J-11025/18/80/FRY(PT) dated.16.02.1983. At a later date Gundla Brahmeswaram Wildlife Sanctuary was notified as extended Core of Nagarjunasagar Tiger Reserve vide G.O. Ms No.50 EFS & T (FOR III) Dept. Dated 18th March 2010.

Nagarjunasagar Srisailam Tiger Reserve is a pristine and unique ecosystem situated in the central part of Andhra Pradesh. The reserve is a repository of rich biodiversity and an abode for endangered, endemic flora and fauna and also famous for its Natural Heritage. Most of the area is hilly terrain with plateaus, ridges, gorges and deep valleys which support tropical mixed dry deciduous and moist deciduous forests with an undergrowth of Bamboo and Grasses. The river Krishna, geologically the oldest river,

passes along the northern edge of the sanctuary over 130 Kms. A multipurpose dam by the name Srisailam Reservoir was constructed on this river. The ancient and holy temple of Lord Shri Bhramaramba Mallikarjuna Swamy is situated inside the Tiger Reserve. This also happens to be one of the 12 Jyotirlinga's in the country.

1.1.2. LOCATION:

NSTR is situated 200 km, west of Guntur on southern side of the banks of the river Krishna. The Tiger Reserve is spread across Nandyal, Prakasam and Palnadu districts.

1.1.2.1 Physical Boundaries:

The Core area is positioned between the reference of Latitudes & Longitudes of $16^{O}35'5.64"$ N - $79^{O}28'27.53"$ E (East side), $15^{O}58'16.35"$ N-$78^{O}36'5.85"$ E (West side), $16^{O}37'6.61"$ N -$79^{O}27'5.69"$ E (North Side) and $15^{O}23'55.62"$- $78^{O}49'11.95"$ E (South side). The Buffer area is positioned between the reference of Latitudes and Longitudes of $16^{O}16'50.24"$ N-$79^{O}33'27.65"$ E (East side), $16^{O}1'20.61"$ N - $78^{O}20'7.60"$ E (West side), $16^{O}33'2.73"$ N - $79^{O}18'34.09"$ E (North side) and $15^{O}10'48.30"$ N - $78^{O}41'31.81"$ E (South side).

Boundaries of Core area of Nagajunasagar Srisailam Tiger Reserve

The boundaries of Core of Nagarjunasagar Srisailam Tiger Reserve as delineated in the map at the office of the Principal Chief Conservator of Forests, Andhra Pradesh, Mangalagiri are as follows:

North:

Station A to C:- The boundary of the core of Nagarjunasagar Srisailam Tiger Reserve from station **"A"** denoted on the map which is the North West corner of Compartment No. 839 and runs along the central line (Mid line) of river Krishna which is inter State boundary between Andhra Pradesh & Telangana i.e., the boundary between Rajiv Gandhi Wildlife Sanctuary of Nagarjunasagar Srisailam Tiger Reserve, Andhra Pradesh on the southern side and Amrabad Tiger Reserve of Telangana State on the northern side of river Krishna.

Then the boundary moves along mid of River Krishna from point 'A' in zig-zag manner in Srisailam, Nekkanti, G.V. Palli and V.P South Ranges and touches the Nagarjunasagar reservoir and further proceeds in northeastern direction along the mid of river Krishna till it reaches point **'B'** i.e., northern part of Compartment No.83 of

Pasuvemula RF of V.P South Range. Then the boundary moves towards eastern direction along northern boundaries of Compartment Nos.85, 86, 87&88 of V.P South Range i.e., point **"C"**.

East:

Station C to D: Then the core boundary of NSTR runs towards southern direction along the southern boundaries of Compartment Nos. 87, 86 and eastern boundaries of Compartment Nos. 83, 77, 75, 70 & 69 of Kandlakunta RF; and Compartment Nos. 68, 67 and 66 of Gangalakunta RF; Compartment Nos. 369 &149 of Markapur RF; Compartment Nos. 146 &147 of ENB-IX RF; Compartment Nos. 140,122,123 &124 of Markapur RF; and Compartment No.125 of ENB-VIII RF and reaches the point **"D"** at south east corner of compartment No. 126 of Y. Palem Range.

Station D to E: Then the core boundary runs towards western direction along the southern boundaries of Compartment Nos. 127, 128, 118, 92 & 381 of Markapur RF; Compartment Nos. 380, 69, 379 & 68 of ENB-VII RF; Compartment nos. 83, 84, 66,64, 18, 17 & 24 of Markapur RF and reaches point **"E"** i.e., south west corner of Compartment no.20 of Markapur RF.

Station E to F: Then the core boundary of NSTR touches the Gundla Brahmeswaram Wildlife Sanctuary from station **'E'** and runs along eastern boundary along the small stream (including stream) towards its origin Peddamanti Konda (757) and thence follows a cut line joining the Konduru Vagu and runs along the said Vagu, it will cross the Kurupenta Chinna Mantanala Rest House. Thence the Eastern boundary runs along Chinnamantanala - Maddipenta road in South–Westerly direction and southern direction till it joining the cart track leading from Komativanibhavi. Thence along the said cart track up to Western boundary of Eastern Nallamalai Reserve Forest along the common boundary of Cumbum Reserve Forest in Southerly and Easterly direction upto South-East corner of Eastern Nallamalai-III Reserve Forest. Thence the boundary line passes along a cut line touching the peaks 843, 795, 454 and 670 Gunikonda and then follows the line joining Motuvagu and the line runs along Motuvagu (including it) up to the point where Motuvagu touches the Western boundary of Eastern Nallamalai Reserve Forest. Thence the boundary line runs in Southerly direction along the common boundary of Eastern Nallamalai-1 Reserve Forest and Cumbum Reserve Forest upto Giddalur – Nandyal road (151 Km stone) as noted on the map. Then the core boundary runs along South East corner of Cumbum Reserve Forest and South –

West corner of Eastern Nallamalai Reserve Forest, the Southern boundary runs in Westerly direction along the Giddalur-Nandyal road (Nandikanuma road which is also the Southern boundary of Cumbum Reserved Forest till they said road meets the Railway Line) thence the Southern boundary runs along the said Railway line (include it) up to a point where the Eastern boundary of Nandyal Extension-1 Reserve Forest crosses Railway line, and thence the line runs along the common boundary of Nandyal Reserve Forest and Nandyal Extension -1 Reserve Forest upto 420 K.M. (Railway line) to meet station-**"F"** noted in the map.

South:

Station F to G: Then the core boundary of NSTR from the point **"F"** which met the South-East corner of Compartment no.775 of Ambavaram Reserve Forest and South-East corner of Eastern Nallamalai Reserve Forest and the boundary runs in western direction along southern boundaries of Compartment no.767 and eastern boundary of Compartment no.693 and runs western direction along the Giddalur-Nandyal road (Nandikanuma road which is also the southern boundary of Cumbum Reserve Forest till the said road meets the Railway line) thence the southern boundary runs along the said railway line (excluding it) upto a point where the Eastern boundary of Nandyal Extension-I Reserve Forest crosses Railway line, and thence the line runs along common boundary of Nandyal Reserve Forest and Nandyal Extension –I Reserve Forest up to 420th Km (Railway line) to meet Station **"G"** noted on the map.

West

Station G to A: Then the core boundary of NSTR from Station **"G"** runs along the Western boundary of Nandyal Reserve Forest which is also a fire line till the line meets the Velgode GBM Forest Road and thence the line runs along the Forest Road till it meets the bund of Velgode (Telugu Ganga Project) balancing Reservoir in Southern side and Western side. Thence the boundary follows the full Reservoir level line (+264.70) up to the point where the Pasurutlavagu touches the full Reservoir level line and thence along the said vagu (including the vagu) to the point where it touches the 220 K.V. line and then the boundary runs in Northeast direction upto Kurnool-Guntur Road as noted in the Map. Then the core boundary of NSTR runs towards the northerly direction along the boundaries of Compartment nos. 757, 755, 754, 753, 752, 751, 861, 860, 859, 858, 857, 856, 836, 837, 840, 838 of Nandikotkur RF and reaches the starting point **"A"**.

1.1.2.2 Location Biogeographic Zonation:

As per the Bio-geographic classification of India by the Wildlife Institute of India, Dehradun, the Tiger Reserve is classified as:

(i)	Bio-geographic Kingdom	: Paleotropical
(ii)	Sub kingdom	: Indo Malayan
(iii)	Bio-geographic zone	: 6 - Deccan peninsula
(iv)	Biotic province	: 6-D Deccan peninsula Central plateau & 6E Deccan peninsula Deccan south

The Core area epitomises the Deccan plateau (6D, 6E) species of flora and fauna.

1.1.3. CONSTITUTION:

Legal Status of the Area:

- Nagarjunasagar-Srisailam Wildlife Sanctuary was declared as a wildlife sanctuary; vide G.O. M.S. No. 485 F and R.D for (iii) Dept. dated 5th July 1978. The details of compartment wise areas are given in **Annexure-II**.
- In principle approval from Government of India was received vide Letter No. J-11025/18/80/FRY (PT) dated 16.02.1983.
- Later Gundla Brahmeswaram Wildlife Sanctuary with an area of 1194 Sq. Kms was notified as extended Core of Nagarjunasagar Srisailam Tiger Reserve vide G.O. Ms No.50 EFS & T (FOR III) Dept. Dated 18th March 2010 and amended in G.O. Ms No.44 EFS & T (FOR III) Dept. Dated 31st May 2012. Detailes in **Annexure-III**
- Nagarjunasagar-Srisailam Wildlife Sanctuary attained the status of Project Tiger area in 1983 vide G.O.Ms.No. 66 F and RD (FOR III) Dated 25.02.1983 with an area of 3568 Sq. Kms. Details in **Annexure –IV**.
- Nagarjunasagar-Srisailam Wildlife Sanctuary was renamed as Rajiv Gandhi Wildlife Sanctuary vide G.O. Ms. No. 233 EFS and T (FOR III) Dept. Dated. 16th September 1992 **(Annexure-V).**
- Final notification of the sanctuary under section 26-A of the Wildlife (Protection) Act, 1972 vide G.O.Ms.No.84; Environment Forests Science and Technology (FOR III) dated 27th June-1998 was published in A.P. Gazette vide notification **(Annexure - VI).** The notification was additionally published in respective District gazettes.

- The Government of Andhra Pradesh notified the area of 2527 Km^2 vide G.O.M.S. No 148, EFS &T (For III) Department dated 20/12/2007 as Critical Tiger Habitat/inviolate area of Nagarjunasagar Srisailam Tiger Reserve. **(Annexure-VII).**
- The Government of India, Ministry of Environment, Forests & Climate Change, New Delhi has issued final notification of Eco-Sensitive zone of Nagarjunasagar Srisailam Tiger Reserve vide notification No.4022, dated: 18.10.2021 covering a geographical area of 2149.68 Sq.Km. **(Annexure – VIII).**

1.1.4. EXTENT (Area statement and legal status):

1.1.4.1. Area Statement 1315.98:

Table 2: Existing Area Statement of NSTR: -

Sl. No	Name of the District(s)	Division	Existing NSTR Area (Sq. km)			
			Core	Buffer	Buffer (With in Sanctuary)	Total (4+5+6)
1	2	3	4	5	6	7
1	Palnadu & Prakasam	PT Markapur	976.08	414.96	552.87	2918.99
2	Nandyal	PT Atmakur	659.55	315.53		
3	Prakasam	PT Giddalur	390.225	0	0	390.225
4	Nandyal	PT Nandyal	418.29	0	0	418.29
		Total	**2444.14**	**730.49**	**552.87**	**3727.50**

Table 3: Proposed Area Statement of NSTR

Sl. No	Name of the District(s)	Division	Proposed NSTR Area (Sq. km)		
			Core	Buffer	Total (4+5)
1	2	3	4	5	6
1	Palnadu & Prakasam	PT Markapur	1315.98	1063.27	2379.25
2	Nandyal	PT Atmakur	783.86	464.85	1248.71
3	Prakasam	PT Giddalur	390.23	614.33	1004.56
4	Nandyal	PT Nandyal	418.29	392.01	810.3
		Total	**2908.36**	**2534.47**	**5442.83**

1.1.4.2. Legal Status

The Core and Buffer areas of NSTR needs to be re-notified together as per Supreme Court orders. After bifurcation of State of Andhra Pradesh and after reorganization of Districts and restructuring of Forest Divisions of Andhra Pradesh the re-notification proposals for reconciled areas of Core and Buffer of NSTR are arrived.

Accordingly, the notification proposals of NSTR Core & Buffer have been submitted to the Government vide Prl. CCF(WL) & CWLW, A.P., Mangalagiri Rc.no.3030/2023/WL-2 Dated 05.07.2023. (**Annexure I**)

1.1.5. Notification

The Core and Buffer areas of NSTR needs to be re-notified together as per Supreme Court orders. After reorganization of State of Andhra Pradesh, the area of NSTR is yet to be notified. Considering the reorganization of the department, in view of the new districts formed, proposals have been sent to the Government for the reconstitution of NSTR by:

(i) including the earlier undeclared proposals to include NSTR buffer and GBM buffer as extended core.

(ii) implementing the NTCA guidelines/ MEE reports which calls for a Unified Command of the entire area of Tiger Reserve.

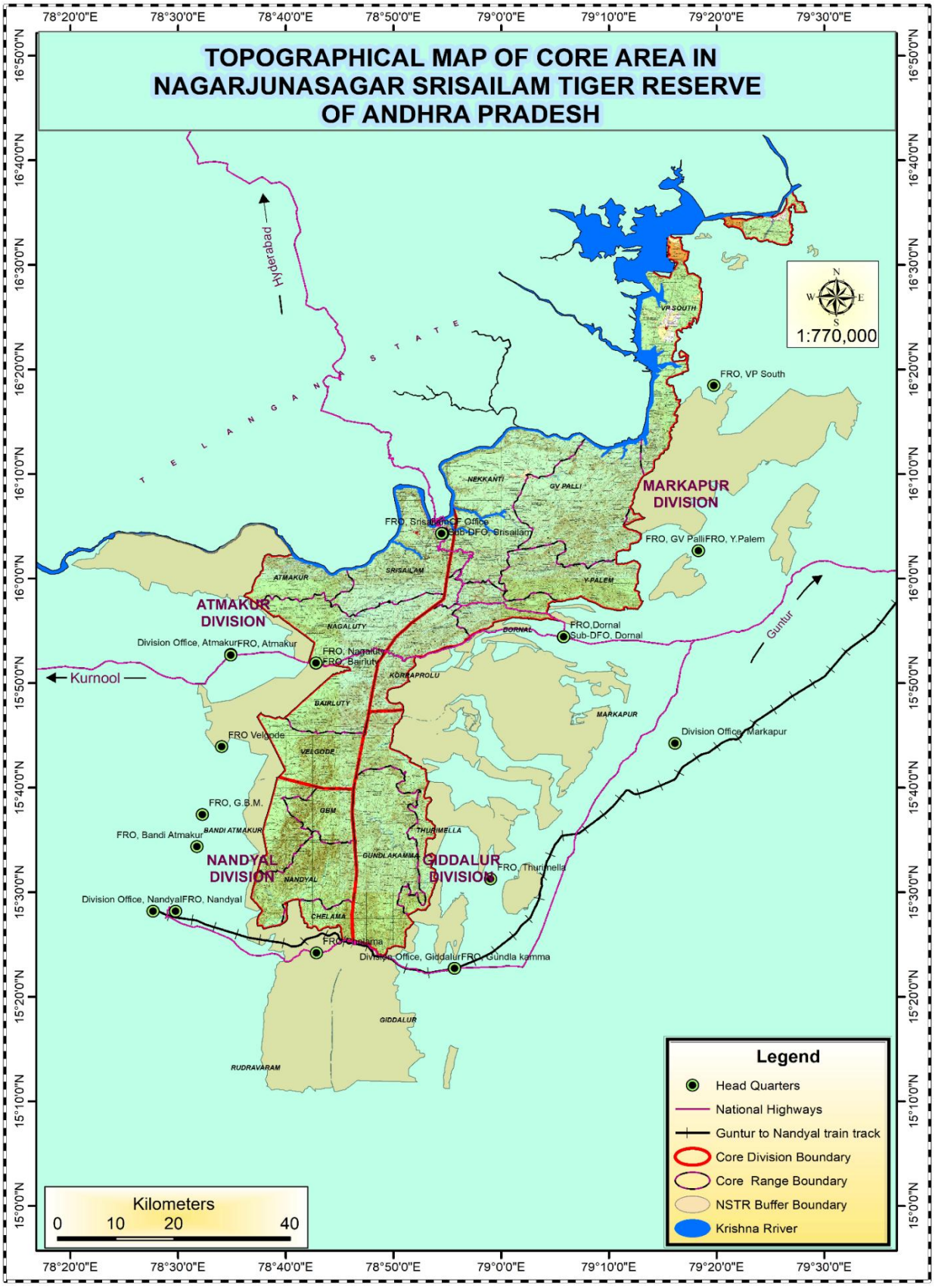
(iii) considering the re-organization of Districts and Forest Department to facilitate the Unified Command.

(iv) re-notifying the areas by the State of Andhra Pradesh, as all the earlier notifications are as per the erstwhile Andhra Pradesh (combined with the State of Telangana).

As per the proposal sent for notification, the Core area of the Tiger Reserve is 2908.36 Km^2 and the Buffer area is 2534.47 Sq. Km and the total landscape excluding the adjoining areas comes to 5442.83Sq. Km. (**Annexure I**)

The total Core area of the tiger reserve is 2908.36 Sq. km and Buffer area is 2534.47 Sq. km.

Map-5 Map showing the Topographical features in Core Area in NSTR



1.2. APPROACH AND ACCESS:

a) By Road:

Northern side:
From Hyderabad to Srisailam - 210 Km

Eastern side:
From Kurnool to Bairluty - 80 Km

Southern side:
From Ongole to Dornal - 140 Km

Western side:
From Guntur to Dornal - 180 Km

b) Nearest Railway station:

Markapur	- 35 Km
Kurnool	- 80 Km
Nandyal	- 20 Km

1.3 SIGNIFICANCE OF THE PROTECTED AREA

NSTR is the largest Tiger Reserve in the country features undulating terrain, subterranean valleys and steep cliffs, vastness, contiguity of forests in the State of Telangana, varied habitats for Tigers, absence of significant human settlements and conflicting human demands on forest resources. The mosaic of habitats, particularly the extensive grasslands and deciduous forests support a good population of Tiger. The Bio geographic location of the area falls in 6 D Deccan Peninsula Central part and 6 E Deccan peninsula Deccan south provinces of Deccan Peninsula Zone as per Bio-geographic classification of Wildlife Institute of India, Dehradun. The vegetation in the Core area of NSTR is broadly three types of forests, viz. Dry Deciduous, Moist Deciduous, and Scrub with their subtypes and several micro-climatic niches wherein fidelity plants come up. The forests are mostly Southern Tropical dry deciduous miscellaneous type 5A/C3 (Champion and Seth 1968). They are further sub-divisible into Teak, Miscellaneous, Nallamaddi, Yepi and Tirman types depending on species preponderance. It protects the catchments of major rivers of Krishna, Gundlakamma and streams, and thereby reduces soil erosion and maintains water regime. It sustains the economic prosperity of the region through downstream irrigation and power supply.

1.3.1. Economic values:

As per the study carried out by Centre for Ecological Services Management, Indian Institute of Forest Management in collaboration with National Tiger Conservation Authority (NTCA) on the valuation of NSTR is as follows:

- The Tiger Reserve provides flow benefits worth of Rs.162.02 billion per year and the stock benefits of Rs 501.30 billion per year.
- Main ecosystem services derived from this result include provisioning of water (Rs.50.55 billion per year), carbon sequestration (₹20.50 billion per year), climate regulation (₹43.01 billion per year), waste assimilation (₹3.25 billion per year).
- As per the MA framework the value of provisioning services was Rs.0.76 billion per year, that of regulating services was Rs.160.41 billion per year, for cultural services it was Rs.17.40 million per year and supporting services were Rs.0.82 billion per year.
- The annual tangible and intangible benefits were found to be worth of ₹0.76 billion and ₹662.54 billion, respectively.
- In terms of the human values and ecosystem assets framework, the annual worth of service categories for adequate resources was ₹51.28 billion, protection was ₹0.24 billion, denying physical and chemical environment was ₹78.27 billion, socio-cultural fulfilment was ₹47.43 million, and ecosystem assets was ₹533.45 billion. The collective worth of ecosystem services having direct & indirect impact on human health was found to be ₹345.92 billion per year.

The Carbon stock assessed by the organisation of the Tiger Reserve is 34.93 million tones. As per the latest paper, the economic value of Carbon stock in NSTR is calculated at Rs. 195.26 billion.

It is estimated that approximately 12.24 million cubic meters of standing stock of timber is contained in NSTR. In addition to this the annual NTFP values around 19.5 million per year which include Gum, Myrobolons, Nux-vomica, Tamarind, seeds of Mahua, Pongamia, Sheekakai, Soapnut, Leaves of Adda leaf, etc., bark of Rela, fruits of Usiri, Velaga, and Karaka, roots of Maredugaddalu and grass species, including broom material.

1.3.2. Biological Values:

NSTR is one of four Eco-floristic zones of Andhra Pradesh, and the core area comes under the biotic provinces of Zone (6) of the Deccan peninsula (6D &6E provinces) and forests are mostly the southern tropical dry-deciduous miscellaneous type as per the Champion and Seth classification.

Ellis (1987) in Flora of Nallamalais recorded 743 taxa under 109 families. Our studies, supplement 798 (52%) taxa under 144 families to the Flora of Nallamalais. As on today, 1629 Flowering plant species are recorded in NSTR, which contains 317 species of Grasses, 610 species of Herbs, 206 species of Shrubs, 208 species of Climbers & lianas and 288 species of Trees. In addition to the flowering plants 22 Pteridophytes are also present in the Reserve.

The major tree species are Teak (*Tectona grandis*), Tuniki (*Diospyros melonoxylon*), Nalla maddi (*Terminalia tomentosa*), Tirman (*Anogeissus latifolia*), Yegisha (*Pterocarpus marsupium*), Bandaru (*Adina cordifolia*), Anduku (*Boswellia serrata*), Ippa (*Madhuca longifolia*), Rela (*Cassia fistula*), Tapasi (*Sterculia urens*), Neredu (*Syzygium cumini*), Mamidi (*Mangifera indica*), Yerumaddi (*Terminalia arjuna*), Buddadarimi (*Careya arborea*), Char (*Buchanania lanzan*), Billudu (*Chloroxylon swietenia*) , Sonari (*Ochna squarrohasa)* and Ullinada (*Diospyros chlorxylon).*

Of the 145 endemic taxa of Eastern Ghats, Nallamalais represent 27 species. *Andrographis beddomei, Alysicarpus mahabubnagarensis, Alysicarpus monilifer var. kadapaensis, Andrographis nallamalayana, Boswellia ovalifoliolata, Bridelia cinerascens, Cleome viscosa var. nagarjunakondensis, Ceropegia spiralis* (Vulnerable), *Chamaesyce linearifolia var. nallamalayana, Chamaesyce senguptae, Crotalaria madurensis var. kurnoolica, Crotalaria paniculata var. nagarjunakondensis, Croton scabiosus, Decalepis hamiltonii, Dicliptera beddomei, Eriolaena lushingtonii* (Vulnerable), *Hybanthus vatsavayii, Indigofera barberi (*Vulnerable), *Murdannia juncoides* (Vulnerable), *Oianthus disciflorus, Pentanema indicum var. sivarajanianum, Rhynchosia beddomei* (Vulnerable), *Rostellualria vahlii var. rupicola, Shorea tumbuggaia Roxb., Syzygium alternifolium, Pterocarpus santalinus and Terminalia pallida* are the endemic plants found in Nallamalais. The wild relatives of crop plants have been recognized to be of immense value in improving the crops. Four species of wild rice are identified in Nallamalais. They are: *Oryza granulata, O. minuta, O. rufipogon and O. sativa.* Most interestingly, wild pepper species *(Piper attenuatum, P. hymenophyllum and P. nigrum)* are present along with wild rice plants. *Coix lachryma-jobi* is wild relative for *Zea mays*, *Atylosia*

scarabaeoides for *Cajanus cajan*, *Canavalia gladiata* for *Lablab purpureus*, *Vigna trilobata* for *Vigna radiata*. In addition to it, wild forms of *Aegle marmelos, Feronia elephantum, Mangifera indica, Syzygium cuminii* are also found throughout the Nallamalais.

The diversity of geo morphology and vegetation gives rise to multitude of habitats and ecological niches that support rich wildlife. Extensive forest areas along the river allow the development of genetically viable populations.

The faunal species: Vertebrates include over 51 species of Mammals, 305 species of Birds, 59 species of Reptiles, 18 species of Amphibians, 55 species of Fishes. The invertebrates include 62 species of Arachnid fauna, 101 species of Butterflies, 137 species of Moths, 46 species of Coleopterian fauna, 30 species of Odonata and other Insects of 64 species.

The main faunal species include predators like Tiger *(Leoparda tigris),* Leapord *(Leoparda pardus),* Sloth bear *(Melursus ursinus*), Wild dog *(Cuon alpinus*), Striped Hyena *(Hyaena hyaena)* and Golden Jackal *(Canis aureus)*. Apart from this, the Tiger Reserve is home to ungulates like Spotted deer or Chital (*Axis axis*), Sambar (*Rusa unicolor)*, Four-horned antelope or Chousingha (*Tetracerus quadricornis*), Nilgai (*Boselaphus tragocamelus*), Wild pig (*Sus scrofa*), Chinkara (*Gazella bennettii*) and Blackbuck (*Antilope cervicapra).* The River Krishna has Mugger Crocodiles (*Crocodylus palustris*), Smooth-coated (*Lutrogale perspicillata*) otters and turtle populations.



Faunal diversity in NSTR

Regarding the bird species in the reserve, it is home for raptors like Crested serpent eagle, Crested hawk eagle, Oriental honey buzzard, Black eagle, Brown fish owl, Spot bellied eagle owl and other species of Accipitridae family members. The long-billed vulture *Gyps indicus*, which is critically endangered has been recorded. The other important bird species found are Common quail (*Coturnix coturnix*), Grey jungle fowl (*Gallus sonneratii*), Grey partridge (*Perdix perdix*), Indian peafowl (*Pavo cristatus*),

Cotton pygmy goose (*Nettapus coromandelianus*), Painted stork (*Mycteria leucocephala*), Black-headed ibis (*Threskiornis melanocephalus*), Great egret (*Ardea alba*), Indian cormorant (*Phalacrocorax fuscicollis*), Black kite (*Milvus migrans*), Shikra (*Accipiter badius*), Bonelli's eagle (*Aquila fasciata*), Crested serpent eagle (*Spilornis cheela*), Tawny eagle (*Aquila rapax*), Pallid harrier (*Circus macrourus*), Lesser sand plover (*Charadrius mongolus*), River tern (*Sterna aurantia*), Green imperial pigeon (*Ducula aenea*), Rose-ringed parakeet (*Psittacula krameri*), Barn owl (*Tyto alba*), Indian scops owl (*Otus bakkamoena*), Indian eagle owl (*Bubo bengalensis*), Indian roller (*Coracias benghalensis*), White-throated kingfisher (*Halcyon smyrnensis*), Asian green bee-eater (*Merops orientalis*), Eurasian golden oriole (*Oriolus oriolus*), Zitting cisticola (*Cisticola juncidis*), Velvet-fronted nuthatch (*Sitta frontalis*), Loten's sunbird (*Cinnyris lotenius*), Indian paradise flycatcher (*Terpsiphone paradise*). The flocks of Demoiselle Cranes and bar headed Geese can be seen along the River Krishna.

Research inventories discovered 10 species of Herpato fauna, 18 species of Mantids, 12 species of Arachnids as new reports to AP. Three new species of Arachnids and one new species of praying mantis discovered from this region. They are:

1. Whip scorpion (*Phrynichus andhraensis Bastawade,* 2005)
2. Tarantula spider (*Poecilotheria nallamalaiensis Thulsi Rao,* 2006)
3. Tommy spider (*Tmarus srisailamensis Thulsi Rao,* 2006)
4. Praying mantid (*Metacromantis nigrofemorata, Ghate*, 2006)



Spiders in NSTR

1.3.3. Catchment Values:

The Krishna River is the third longest river in the country and fourth largest in terms of water inflow and river basin area after Ganges, Indus and Godavari. It is the source of irrigation in the states of Telangana and Andhra Pradesh. The entire tiger reserve is a catchment of the Krishna and Gundlakamma river and other smaller tributaries, streams and nallahs. River Krishna is the lifeline of both the Telugu states, it serves almost 35-40% of drinking water of both states and almost 1/3rd of irrigation requirement and to a major extent supplies hydel electricity to both the states.

Srisailam and Nagarjunasagar Dams are there on the river which supply water for irrigation and used for generating electricity. It is estimated that the Krishna River provides 49.77 billion liters of water and economic value of electricity production is equal to 785.45 million/ KWH (for the year 2015-16).



A view of Krishna River through NSTR

1.3.4. Recreational Values:

The scenic escarpments with deep and vertical gorges along the streams rolling mountainous plateau and grasslands of NSTR are a treat to the visitor's eye. NSTR is a heaven for tourists, having ecotourism centres at Bairluty, Pacherla, Tummalabailu, Ecologial Knowledge Park and Boating in Krishna River. Jungle safari, Jungle camps, Nature trails, trekking, bird/butterfly watching, archery and heritage walks, are available. Rollapadu Wildlife Sanctuary, which is a unique Grassland Savanna, is also an attraction. It is home to grassland specialist species like the Lesser Florican & Great

Indian Bustard. It has rolling grasslands, unique bird diversity and is a wintering home of Harriers in south India.



A waterfall in NSTR

1.3.5. Scientific and educational Values:

NSTR has tremendous potential for research owing to undisturbed forest patches and rich cultural heritage. Till date 50+ research papers have been published on the flora and fauna of the NSTR. It has two interpretation centers of wildlife and their conservation. Awareness and education about the core and buffer of the NSTR is imparted to students, conservationists, law makers and public by regularly organizing nature camps, awareness trainings and workshops. Ecological Knowledge Park located at Sundipenta is established to create awareness on process of evolution via models, which is the first of its kind in a tiger reserve in the country. Biodiversity Research Centre is an ecological research and monitoring lab set up at Sundipenta, it has a collection of Zoological specimens with different taxa like Fishes, Amphibians, Reptilian species Insect species and Mammalian species.



Ecological Knowledge Park in Sundipenta near Srisailam

1.3.6. Spiritual and Historical values:

NSTR has a number of places of religious importance. It has a total of 31 temples, including the one of the Jyothirlinga of Sri Lord Mallikarjuna Swamy temple. Other important temples are Hatakeswaram, Paladara-Panchadara, Istakameswari Temple, Bheemuni kolanu, Shikaram, Sakhshi Ganapathi temple, Nagaluty, Rudrakodur, Gundla Brahmeswaram temple, Mahanandi and Narsimhaswamy temples. Around three crores of pilgrims visit these temples every year, majority of them are to Srisailam.

The Cumbum Lake is one of the Asia's oldest manmade lakes and dates back to the 15th century AD. It was built by the Gajapati kings of Odisha for the purpose of irrigating 420 km^2 of farm land. It was repaired by Queen Varadharajamma of the Vijayanagar dynasty in the 16th century AD.

CHAPTER - 2
Background Information and Attributes



The Rajiv Gandhi Wildlife Sanctuary and Gundla Brahmeswaram Wildlife Sanctuary are the prime habitat of Tigers. The adjoining areas are also rich in wildlife and are in process of notification as per the guidelines of National Tiger Conservation Authority.

ATTRIBUTES OF THE PROTECTED AREA:

2.1. GEOLOGY, ROCK AND SOIL:

Geology, Rock:

The principal formations of Nallamala in Core area are Kurnool - Kadapa formations. The Kurnool formation is of upper Pre-Cambrian and is mainly in the central basin of Nallamala, extending up to Krishna on the north. Major portion of the area is covered by the old geological formation known as the **'Archaens'**. These are non-fossiliferous rocks formed about 2000 million years ago (Archaens), when the conditions for the existence of life on the earth were not favorable. Srisailam quartzite's forms a rugged plateau with bluish, grey brown and purplish colors. There are almost horizontal beds of sedimentary rocks with a remarkable flat-topped appearance ending abruptly in sharp edges.

Soils:

There are mainly three types of soils - red, mixed, and black cotton varieties in this Critical tiger habitat/inviolate area/core area. The red and mixed varieties occur along the foothills of Nallamala. Towards the interior of the forests the soil is red with calcareous shales. The humus content is almost negligible. The black cotton soil occurs in plains where cultivation is practiced. The soil over 66% of the area is very shallow (30 cm depth), while the remaining 34% is medium to considerable deep (30 cm - 90 cm and above). Mixed and red soils predominantly occur in 93% of the total area followed by black soils in 4 % and rest others.

2.2. TERRAIN CHARACTERISTICS:

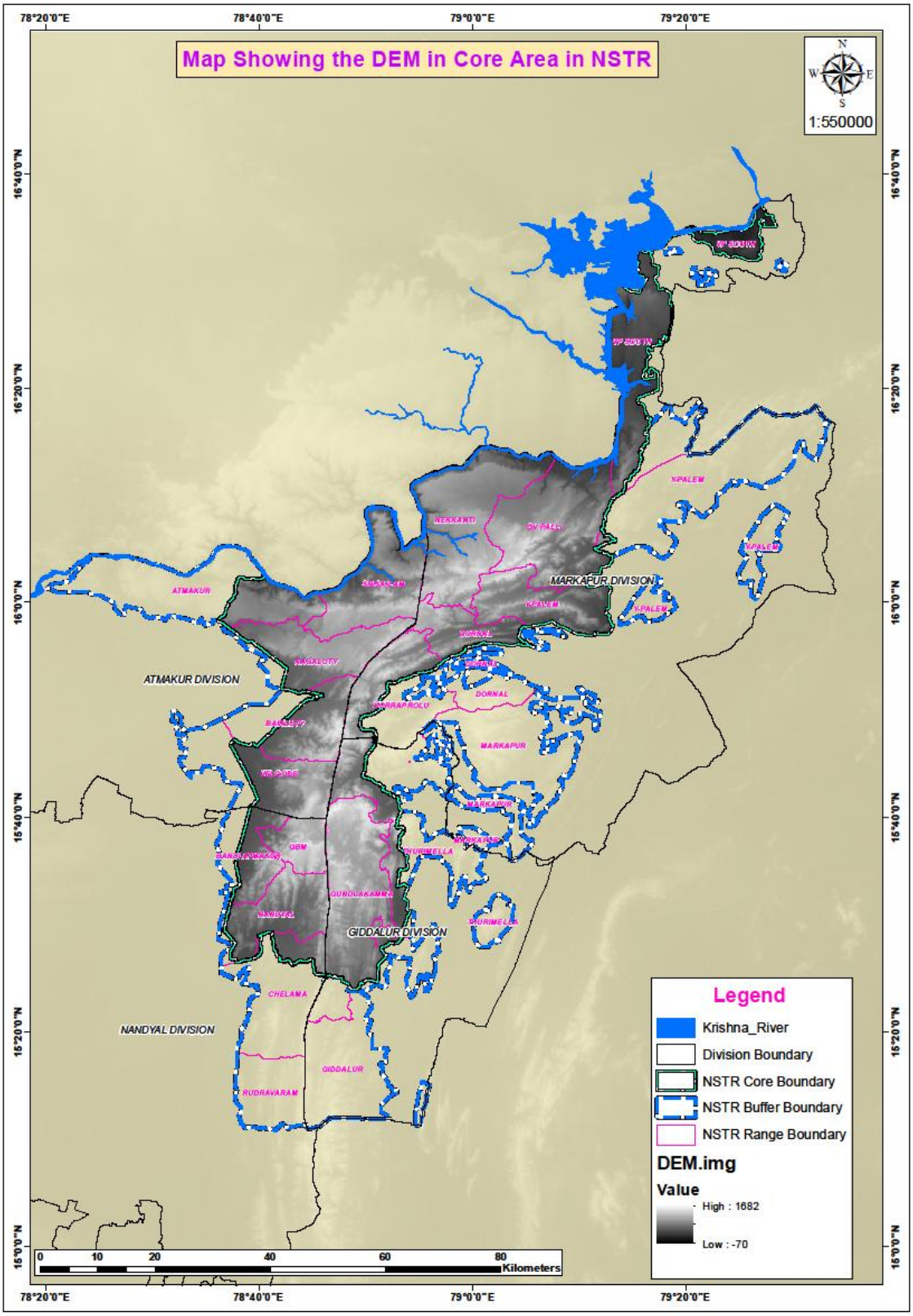
Topography:

The Core area of Nallamala form an unbroken, rugged and rather steep hill ranges. A series of folds from the main ridge runs in a westerly direction, descending into the plains of Atmakur. The hills descend towards the north to widen into the plateaus of Peddacheruvu, Sivapuram and Srisailam, which abruptly further descends precipitously into the krishna valley for about 300 mts.

Elevation:

In the hilly portion, nearly 1% of the total area occurs at an elevation of 900 m.”10% of the area lies between 700 - 800 m “13% of area lies between 300 - 500 m.” 76% below 200 m.” Durgamkonda in Markapur Reserve Forest, Prakasam Dist. is the highest peak (917 m.). The lowest elevation in the Core area is Krishna River (100 m. from MSL) east of Nagarjunasagar Dam.

Map 6: - Map showing DEM in Critical Tiger Habitat in NSTR



2.3. CLIMATE

The climate of the area is characterized by a hot summer, well distributed rainfall during the South-West Monsoon season and North East-monsoon and general dryness except in the rainy season. The cold season is from December to February. This is followed by the hot season from March to May. The South West Monsoon season is from June to September-October and November constitute the post monsoon season. The North-east monsoon is active in November and first half of December mainly on eastern slopes of Nallamala. The Core area falls under dry regions of peninsular India. One can experience the extremities of climate within the Core area. These extremities, however, are not that perceptible, right inside wooded areas as the plant cover influences them.

Rainfall:

Major portion of rainfall is received from the Southwest monsoon that generally sets in second half of June and continues up to the first week of October. Then there is a short dry spell for a month. The western half of the Core area in north-south direction falls under Atmakur and, Nandyal Divisions in Nandyal District and receives the south-west monsoon. The Eastern half encompassing the V.P. South Range of Markapur Division in Palnadu District and Markapur and Giddalur Wildlife Division in Prakasam District receive the rains from north-east monsoon.The Northeast monsoon is active in November and first half of December mainly on eastern slopes of Nallamala. At times, the cyclones with heavy gales from the East coast have considerable effect on the forests of Core area in Prakasam District. About 55 % of rainfall is from south-west monsoon on the Eastern slopes of Core area. The rest of the precipitation is due to the pre-monsoon showers in April-May. The areas of Markapur division mostly gets showers from north-east monsoon. The average annual rainfall for the last decade is about 700 mm as against the Average rainfall of Nallamala- 740 mm.

Temperature:

The diurnal variation in temperature is high in the Critical tiger habitat/inviolate area/core area. Extreme climatic conditions are experienced in the Core area with a maximum temperature of about 43^0 C in summer and minimum temperature of 16^0 C during winter nights. The hot period is from March to May. The mean annual temperature at different places in the plains of Core area varies between 28^0 C- 32^0 C. Maximum and minimum temperatures recorded at Srisailam during the year 2022 were

42^0 C and 20^0C respectively. Cold weather can be perceived by the end of November and continues until the middle of February.

The weather is clear from February to April when wind blows from south-west.

Humidity:

The air is generally dry over the area, except during the Monsoon seasons, when the humidity exceeds 80%. The humidity in the area varies between 40 – 50% during the non-monsoon period.

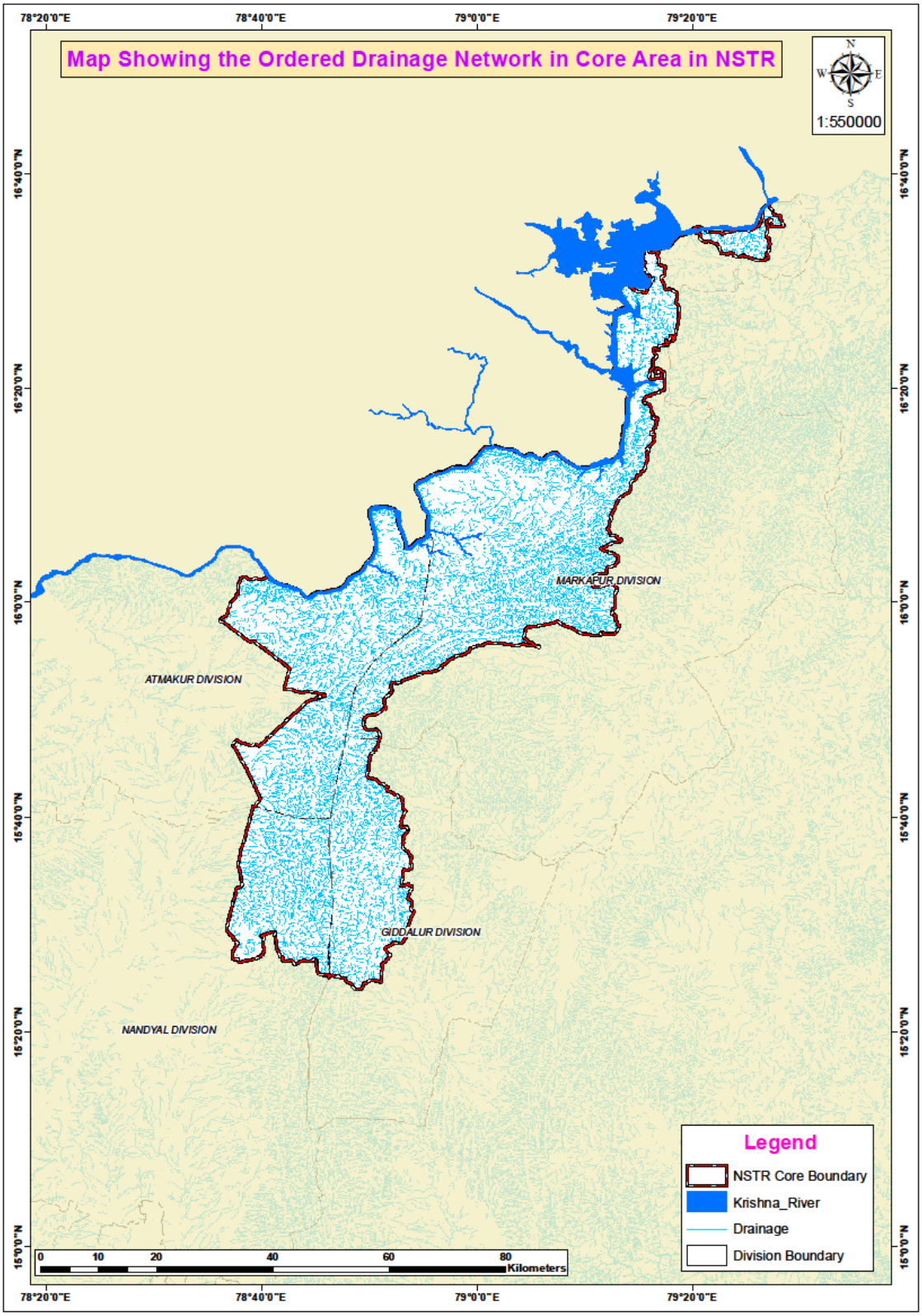
2.4. HYDROLOGY AND WATER SOURCES:

Streams:

There are numerous streams, small and big, almost covering the entire reserve, most of which join river Krishna and Gundlakamma ultimately. Most of these streams are dry throughout the year except for a few months (July-November). Nekkantivagu, Kamakshammavagu, Dwarapusarivagu, Maddulasarivagu, Jeerivagu, Gandivagu, Chamavagu and Nippulagundamvagu in Markapur R.F and Bhimuni Kolanuvagu, Munimaduguleru, Amudalapentavagu and Pangdivagu in Nandikotkur R.F. contain perennial water sources even in summer period.

The Gundlakamma River rises in the heart of the Extended Core area of Gundlabramheswara Sanctuary and the Cumbum tank is formed by bund across this river in the plains outside the Reserve. The river Gundlakamma flows over a length of 200 Kms and is a major drinking water source for Ongole and many towns and villages of Prakasam District.

Map 7
Map showing Ordered Drainage Network in Critical Tiger Habitat of NSTR.



Springs:

Many perennial springs are located at the origin of hill streams in Nallamala. At many such places, Chenchus, the native tribesmen set up their dwellings called 'Gudems'. A list of springs (Perennial) is given below.

Table 4: - List of springs (perennial) in Core Area of NSTR

Giddalur	Markapur	Atmakur	Nandyal
1. Maddi Penta 2. Obulesuni Penta 3. Rakasipenta 4. Rangaswami Temple Falls 5. Puligindi 6. Jangujari Konda	1. Rollapenta 2. Gunta Madugu 3. Chinnamantral-amma 4. Gundikonda	1. Gunta Madugu 2. Pasurutla 3. Rudracode 4. Addutla	1. Basireddy Penta 2. Gadigundam 3. Gundlakamma

Water Falls:

There are numerous waterfalls, seasonal and perennial, scattered across the tiger reserve. Some of the worth -mentioning perennial waterfalls are: Ethipothala Falls (21 m) on river Chandravanka, Jendapenta Falls on Jarrivagu (75 m) in Palnadu District, and Palanka Falls (200 m) on Palankavagu in Prakasam District.

Tanks:

Many fresh water tanks constructed in series, during Vijayanagar dynasty, still exist within and outside the Core area. These are constructed along a gradient to let the spilled over waters from upland tanks into the downhill ones in the plains. Some of them are now heavily silted up.

Reservoirs:

Srisailam Reservoir (40 Sq.Km.) is located within the Core area due to the construction of Hydro-electric project. Srisailam dam is high masonry dam of straight gravity type, with an overall length of 512m and a maximum height of 144m from the deepest foundation level. The dam has a storage capacity of 8723 Mm3 (308 TMC) at Full Reservoir Level 269.75 m (EL 885 feet). It has a discharging capacity of 37384 cum/sec (1320000 cusec). The deepest portion of the reservoir has a depth of 60 m to 90 m for an extent of 250 Sq. Km. The shallow reservoir area with depth below 30m is 365 Sq.Km. The depth of the reservoir at the dam site is 118m.

A significant characteristic of the Srisailam Reservoir is that 54km of the reservoir flows between deep gorges with steeply rising hill ranges on either side, and the depth is more than the width. It varies from 60m to 90m in this portion and the reservoir from Sidheswaram spreads out into a wide but shallow portion where the depth is between 9m and 15m and is surrounded by thick and verdant forest vegetation of NSTR.



A View of Krishna River In NSTR

2.5. VEGETATION AND COVER TYPES:

The Core area of the Tiger reserve falls in three districts and comes under moist, dry and very dry ecological zones.

2.5.1. Vegetative Resources of Core area in General:

The Core area forms catchment in the Nallamala, which is about 10,416.76 Km^2 in its extent. The state Forest Resources Survey division carried out P.I.S. in 1970-74 in this catchment.

The forests are mostly Southern Tropical dry deciduous miscellaneous type 5A/C3 (Champion and Seth 1968). They are further sub-divisible into Teak (*Tectona grandis*), Miscellaneous, Nallamaddi (*Terminalia tomentosa*), Yepi (*Hardwickia binata*) and Tirman *(Anogeissus latifolia)* types depending on species preponderance.

2.5.2. The Forest types, cover and food for Wild Animals:

Although the main mass of natural vegetation belongs to the dry mixed deciduous forest type, there are several types and sub-types that differ widely with regard to their physiognomy, floristic composition and dynamism as a reflex of the variation in climate, topography, soil and biotic interference.

Therefore, the vegetation of the Core area can be classified under Group 5 and 6 of the "Forest Types of India" (1968) adopted by the "Champion and Seth".

- Southern dry mixed deciduous forests - 5A/C3
- Southern tropical Moist Deciduous (Non-Sal) Forest - 3
- Southern Tropical thorn forests - 6/A/C1

Degradation stage

- Southern dry deciduous scrub forests - 5/DS1
- Southern thorn scrub - 6A/C1/DS1
- Southern *Euphorbia* scrub - 6A/C1/DS2

Edaphic type

- *Boswellia serrata* forests - 5/E2
- *Hardwickia binata* forests - 5/E4

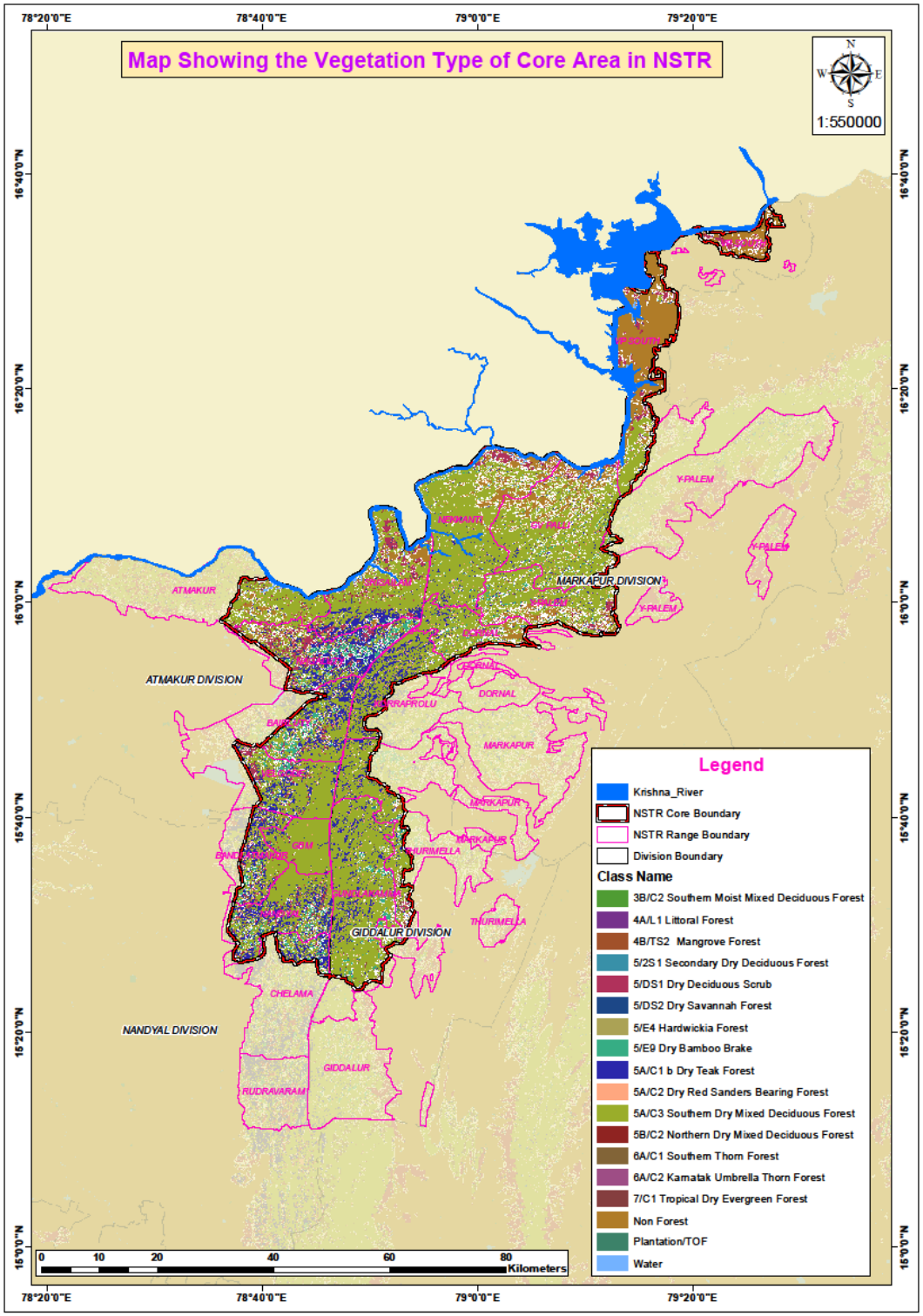
2.5.3. Plant diversity *niches*:

The vegetation in the Core area of NSTR is broadly Tropical vegetation containing three types of forests, viz. Dry Deciduous, Moist Deciduous and Scrub, which occur with their subtypes and several micro-climatic *niches,* and wherein fidelity plants come up. All these have been dealt hereunder:

Following broadly the classification of forests by Champion and Seth (1968), the following types have been designated for the forests of the Critical tiger habitat/inviolate area/core area: -

i. Southern Dry Mixed Deciduous forests,
ii. South Indian Moist Deciduous forests,
iii. Slightly Moist Teak forests,
iv. Tropical Riparian Fringing forests,
v. Tropical Dry Evergreen forests and
vi. Scrub-further differentiating this into *Euphorbia* type, *Acacia type*, etc. Intermixed with Dry Deciduous forests are the edaphic climaxes like *Boswellia* type, c*alamus* forests, *Phoenix humilis* var. *pedunculata* type, and almost pure formation of *Terminalia tomentosa* type.

Map 8:- Map showing Vegetation Type of Core area in NSTR



2.5.4. Special Features of Forests: -

- Moist Deciduous forests occur mainly in the northern part and generally along the permanent small streams.
- It is of interest that *Mangifera indica* occurs along the streams. The wet parts are occupied by *Costus speciosus*, *Clerodendron serratum*, etc. *Barleria strigosa* forms a dense population near the small river falls.
- *Entada pursaetha* and *Bauhinia vahlii* form huge lianas. Most interestingly *Piper attenuatum*, *P. hymenophyllum, P. nigrum* are also present in this reserve.
- The other plants typical of such an environment are *Cleistanthus collinus, C. patulus, Dillenia pentagyna, Careya arborea, Osbeckia muralis, Pouzolzia zeylanica, Globba marantina, Tacca leontopetaloides*.
- The most interesting *Athyrium hoheneckerianum*, an almost aquatic fern, has been located in a shady place where the substratum is sprayed by falling stream continuously throughout the year.
- On the banks of the streams and at moist places, *Ficus hispida, Trema orientalis, Glochidion zeylanica, Suregada lanceolatum* are common. On the slopes of the bank of river Krishna, *Barringtonia racemosa* occurs.
- Near the fringes of tanks, *Dendrocalamus strictus* forms a dense forest. *Murraya koenigii* is confined to the Eastern Nallamala where aridity is very much evident. *Hugonia mystax* forms another associate.
- Thorny scrub near the very dry localities, especially Peddachama, has a population of *Acacia catechu* var. *chudra*, *A. horrida, A. leucophleoa, A. nilotica, Aegle marmelos, Capparis divaricata, Dichrostachys cinerea, Limonia acidissima, etc., Albizia lebbeck, A. ordoratissima, Ailanthus excelsa, Balanites aegyptiaca, Ochna obtusata*, and many species of *Grewia*.
- In the degraded forests, *Cassia auriculata, C. fistula*, and others occur.
- The old trees commonly found are *Ficus, Terminalia, Hardwickia, Bombax, Tamarindus, Syzygium, Pterocarpus,* and *Albizia* species.
- Very large and old trees are becoming rare in these Reserves. *Ficus bengalensis* has grown to large sizes in a few places like Chintala, Pecheruvu, Chinnarutla.

2.6. WILD FAUNA, HABITATS AND TROPIC NICHES:

The faunal composition represents the Deccan Peninsular zone under bio-geographic classification of India. The diversity of geo-morphology and vegetation gives rise to multitude of habitats and ecological niches that support rich wildlife. Most of the NSTR is covered with open forest vegetation and forms an ideal habitat for wild animals. N.S.T.R. harbours some of the true Indian animals being its position in Deccan plateau of peninsular India.

The Reserve is home for over 51 species of Mammals, 305 species of Birds, 59 species of Reptiles, 18 species of Amphibians, 55 species of Fishes, 101 species of Butterflies, 137 species of Moths, 46 species of Coleopteran, 30 species of Odonata and numerous other forms of insects are found in the area. In which these are newly identified species.

- Birds - Spot bellied Eagle Owl
- Reptiles - Sri Lankan Flying snake and Slender Coral snake
- Coleopteran - *Cerapterus latipes* and *Dorysthenus rostratus*

2.6.1. Amphibians Diversity:

The Reserve is home to nearly eighteen species of Amphibians which include Marbled toad (*Bufo stomaticus*), Painted kaloula (*Uperodon taprobanicus*), Balloon frog (*Uperodon globulosus*), Skittering frog (*Euphlyctis cyanophlyctis*), East Asian tree frog (*Polypedates leucomystax*), and Indian bull frog (*Hoplobatrachus tigerinus*).

2.6.2. Reptiles Diversity:

Due to the varied habitat, the Reserve is endowed with the rich diversity of Reptiles. It varies from the huge Indian Rock Python to the tiny Worm Snake which look more like Worm. The Reserve is home to a variety of Snakes, Indian Cobra (*Naja naja)*, Vine Snake (*Ahaetulla nasuta*), Common Krait (*Bungarus caeruleus*), Wolf Snake (*Lycodon aulicus*), Green Keelback (*Macropisthodon plumbicolor*), Rat Snake (*Ptyas mucosa*), Rock Python (*Python molurus*), Bamboo pit viper (*Trimeresurus gramineus*), and Russel's Viper (*Daboia russelii*). Some snakes like Green Pit Viper (*Trimeresurus ramineus*), and Cat snakes are more likely to be seen in the Moist Deciduous forests in the western parts of the Reserve. Pond Terrapins (*Melanochelys trijuga*), and Indian

mud turtles (*Lissemys punctata*), are common in the water bodies. Indian star tortoise (*Geochelone elegans*), which is the smallest Indian tortoise growing only up to 15 cms, can be commonly sighted in the drier parts. The marsh crocodile (*Crocodylus palustris*) is found in the back waters of the reservoir. The common Indian monitor lizard (*Varanus bengalensis*) is the largest of the lizard species. The other lizard species are the Garden lizard (*Calotes* sp.) and skinks (*Mabuya* sp.). Indian Krait, Bamboo pit viper, green pit viper, Russel's viper, saw scale viper, Indian cobra and slender coral snake are poisonous snakes.



Sri Lankan Flying snake (*Chrysopelea taprobanica*)



Slender Coral snake (*Calliophis melanurus)*

2.6.3. Avian Fauna:

The avian diversity of India is represented by about 1366+ species and the state of Andhra Pradesh having 550 + species, out of which 305 species are recorded in the Reserve. The species belonging to families of Phasianidae, Anatidae, Turnicidae, Picidae (wood peckers), Megalaimidae (barbets), Bucerotidae (hornbills), Upupiformes, Coraciidae (Rollers), Alcedinidae, (King fishers), Meropidae (Bee eaters), Cuculidae (Cuckoos), Centropodidae (coucals), Psittacidae (Parakeets), Apodidae(Swifts), Hemiprocnidae (Tree swifts), Tytonidae (Grass owls), Strigidae (Owls), Caprimulgidae (Owls), Columbidae (Pigeons and doves), Rallidae (Rails), Pteroclididae (Sandgrouses), Scolopacidae (Curlews), Cacanidae (Jacanas), Charadriidae (Lapwings), Glareolidae (Coursers), Laridae (Gulls), Accipitridae (Hawks, Eagles, Kites, Falcons and Vultures), Podicipedidae, Phalacrocoracidae (Cormorants), Ardeidae (Egrets, Herons, Bitterns), Threskiornithidae (Ibis and spoon bills) and Ciconiidae (Storks).

The Reserve is home for raptors like Crested serpent eagle, Crested hawk eagle, Oriental honey buzzard, Black eagle, Brown fish owl, Spot bellied eagle owl and other species of Accipitridae family members. The long-billed vulture, *Gyps indicus,* which critically endangered is found in the reserve. The other important bird species found

are Common quail (*Coturnix coturnix*), Grey junglefowl (*Gallus sonneratii*), Grey partridge (*Perdix perdix*), Indian peafowl (*Pavo cristatus*), Cotton pygmy goose (*Nettapus coromandelianus*), Painted stork (*Mycteria leucocephala*), Black-headed ibis (*Threskiornis melanocephalus*), Great egret (*Ardea alba*), Indian cormorant (*Phalacrocorax fuscicollis*), Black kite (*Milvus migrans*), Shikra (*Accipiter badius*), Bonelli's eagle (*Aquila fasciata*), Crested serpent eagle (*Spilornis cheela*), Tawny eagle (*Aquila rapax*), Pallid harrier (*Circus macrourus*), Lesser sand plover (*Charadrius mongolus*), River tern (*Sterna aurantia*), Green imperial pigeon (*Ducula aenea*), Rose-ringed parakeet (*Psittacula krameri*), Barn owl (*Tyto alba*), Indian scops owl (*Otus bakkamoena*), Indian eagle owl (*Bubo bengalensis*), Indian roller (*Coracias benghalensis*), White-throated kingfisher (*Halcyon smyrnensis*), Asian green bee-eater (*Merops orientalis*), Eurasian golden oriole (*Oriolus oriolus*), Zitting cisticola (*Cisticola juncidis*), Velvet-fronted nuthatch (*Sitta frontalis*), Loten's sunbird (*Cinnyris lotenius*), and Indian paradise flycatcher (*Terpsiphone paradisi*). The flocks of Demoiselle Cranes and Bar headed Geese can be seen along the River Krishna.



Spot-bellied eagle-owl (Ketupa nipalensis)



Crested serpent eagle (*Spilornis cheela*)

2.6.4 Mammalian Diversity:

More than 400 Mammal species are present in India and 51 species are recorded in the Reserve. All together 8 orders of mammals were recorded during the study.The order Chiroptera, represented by 13 species of frugivorous and insectivorous bats, is the most diverse order. Among the frugivorous bats, Leschnault's fruit bat (*Rousettus leschenaultii*), Indian flying fox (*Pteropus gigateus*), and short nosed fruit bat (*Cynopterus sphinx*) are commonly found. Among the insectivorous bats, Black bearded tomb bat (*Taphozous melanopogon*), leaf nosed bat (*Hipposideros lankadiva*), Lesser Mouse – Tailed bat (*Rhinopoma hardwickii*), Schneider's Leafnosed bat (*Hipposideros speoris*), were common throughout the area. Greater False Vampire (*Megaderma lyra*), Indian pipistrelle (*Pipistrellus coromandra*), and Lesser Wooly Horse Shoe Bat (*Rhinolophus beddomei*), which were rarely encountered.

In the order Primates, out of 23 species found in India, 3 species are present in the Reserve which are Gray Langur (*Semnopithecus entellus)*, Bonnet Macaque (*Macaca radiata*), and Rhesus Macaque (*Macaca mulatta*). Gray langur is found inside the Reserve in troops, almost in all areas generally associated with the Chital. They alert the deer when any suspicious movement of carnivores is sensed or seen. However, these monkeys which are pure vegetarian in nature eating tender leaves, flower buds and fruits of various species of plants and trees of the forest are also used to beg food from the tourists and others visiting the Reserves. They are less aggressive as compared to Bonnet Macaque in their approach to human. Bonnet Macaque is commonly found in the Reserve in Deciduous forests and fringes of the Reserve especially near plantations and is omnivorous. Because of the unhealthy practice of tourists/visitors feeding these monkeys has led to littering the tourist spots, even snatching and stealing food from them.

The order Carnivora is represented by 17 species. Out of the 36 species of cats (Felids/ the family Felidae) found in the world, 15 species occur in India. Tiger, Leopard, Jungle Cat, one of the highly endangered lesser cats, and the Rusty Spotted Cat are the four species found in the Reserve. The Reserve is home to one of the high-density source populations of the wild tigers in the world. 87 + tigers are present in the entire landscape which include (27) breeding females. The fairly high population which is breeding coupled with large prey base suggests that it is an excellent habitat for Tigers. The other important cat, Leopard, like the Tiger, are also well distributed in the Reserve. Even the adverse changes that have taken place in the thorn forest habitat do not appear to have affected them. Jungle Cat is the most common wild cat of India. They are frequently seen during the day usually in the mornings and evenings and occur in most of the habitat types of the Reserve.

Wild canids in India are among the most under-represented large Mammal groups in terms of research and conservation focus. Out of the (8) species of canids four species are found in the Reserve viz. the Wild dog (*Cuon alpines*), Bengal fox (V*ulpes bengalensis)*, Indian wolf (*Canis lupus*) and the Jackal (*Canis aureus*). Further, one species viz the Striped Hyaena (*Hyaena hyaena*) occurs in the Reserve. In the recent past, the Indian wolf and striped hyaena have not been recorded in the Tiger Reserve. Wild dogs are well distributed throughout the Reserve; a large pack of 40 Nos sighted

in Velgode Range. Jackals are commonly seen in the fringes of Reserve adjoining the human habitation.

The order Artiodactyla is commonly represented by common species such as Wild pig (*Sus scrofa*), Spotted deer (*Axis axis*), Sambar (*Rusa unicolor*), Mouse deer (*Tragulus meminna*), Black buck (*Antelope cervicapra*), Indian Gazelle (*Gazella bennettii*), Four horned Antelope (*Tetracerus quadricornis*) and Nilgai (*Boselaphus tragocamelus*) are commonly seen. Chital, Sambar, Four Horned Antelope and Wild pig are well distributed in the area. Nilgai is mostly found in plateau area of Nekkanti Range of Markapur Division and in the fringes of the Reserve. Chinkara is seen in VP south, Nekkanti and Palutla areas of Markapur Division. Mouse Deer (*Tragulus meminna*) are tiny little creatures inhabiting the moist areas of the Reserve. Being nocturnal in nature, they are generally sighted during the nights on the interior roads of the Reserve.

Sloth Bear, the sole representative of the family Ursidae is common species in the Reserve. The population of Sloth bear is on the increase and is sighted all over the Tiger Reserve. The order Pholidata is represented by a single species from the Manidae family, the Indian Pangolin *(Manis crassicaudata*). Though population is there, they are rarely seen in the reserve.

The order Rodentia is represents by Sciuridae and Muridae families, consists of 7 species, which include Indian palm squirrel (three-striped palm squirrel) and Indian giant squirrel seen across the Reserve.

Mustelids Otters (*Lutra lutra*): Three species of otters are found in India. Smooth coated otters are found mainly in standing water; other otter prefers running streams. The Smooth coated species of otter occur in the Reservoir and few other large water bodies inside the Reserve.

There are 8 different species of Wild civets found in India out of which Common Palm civets and Small Indian civets are seen in the Reserve. They are omnivorous and frugivorous too. Small Indian Civet is a common ring-tailed civet present throughout the Reserve in all habitat types but not very commonly seen. Dry or moist conditions make no difference to the choice of the habitat for this species, but it keeps out of heavy canopy forests and prefer long grass or under bushes. Common Palm Civet has widespread distribution in the Reserve and is the most easily visible in the Reserve.

Indian Crested Porcupine (*Hystrix indica*) is represented in the order Hystricidae. They occur in most parts of the Reserve particularly the rocky hill sides, open hill sides and

deciduous forests. Food habit mainly consists of succulent fruits, tender parts of plants and cultivated crops near the forest margin. It also eats the parts of trees at ground level. Nipping at the tips of the freshly shed antlers of the deer is also observed (Calcium supplements for growing quills). Tiger and Leopard are known to prey upon this, at the risk of injuries with broken and embedded quills getting stuck on their paws, shoulders and even eyes. This in turn would result in incapacitating them from hunting their natural prey and make them cattle lifters and human killers. Poaching for meat by local tribes is the major conservation issues.

The order insectivora represented by 2 species belonging to single family Soricidae. The common species like Asian house shrew (*Suncus murinus*) and Madras Tree shrew (*Anathana ellioti*) are seen in this reserve.

Lagomorph group is represented by two species in India. One species commonly found in the reserve is Black naped hare (*Lepus nigricollis*) belonging to family Leporidae. The Black naped hare is the only species found in the Reserve. It is quite abundant and well spread over the entire Reserve in general and particularly seen in the open areas. This is commonly preyed upon by the Leopard and the Jungle cats.

Out of 6 Herpestid species in India, Indian grey mongoose (*Urva edwardsii*) and Ruddy mongoose (*Urva smithii*) are found in the Reserve. Indian Grey Mongoose is commonly found near forest boundaries in the Reserve, the open scrub, cultivated land, rocky patches and forest edges being the habitat. The abundance of scats in all the vegetation types in the Reserve confirms the commonness of this animal. Ruddy mongoose of peninsular India, resembles the grey mongoose, but has a reddish-brown infusion particularly on the head, neck and the shoulder. It is distributed all over the Reserve.







Mammalian Diversity in NSTR

2.6.5. Fishes:

The Tiger Reserve constitutes significant piscine fauna comprising 55 species of 36 genera under 22 families. The water bodies like ponds, puddles, foothills, hill streams, rivulets and the river Krishna, with two larger reservoirs formed by the two dams, support excellent Fish fauna.

In the post monsoon months, rivulets in the head water regions of these streams become dry and water is restricted to pools and shallow tanks along course of the streams. Of the 55 species, order Cypriniformes (Carps, Minnows, loaches) is represented by 21 species. Fishes of the family Cyprinidae were found to be dominant with 20 species. Genus Puntius is represented by 9 species and showed wide diversity. Sri Lankan Species *Puntius bimaculatus* is also recorded in the reserve. Eight species of cat fishes (Siluriformes), six species of perches (Perciformes) and two species of Murrells are recorded form the water bodies. These fishes are major food source for the Crocodiles, otters and terrapins etc.,

About 1500 + fishermen families from coastal areas of Andhra Pradesh have migrated and settled all along the river course. Fishing nets laid across the river are major threat to the crocodiles. Anthropological activities and heavy influx of pesticides through drainage from the adjoining fields would cause major threat to these fishes in the future. For conserving the precious Ichthyofauna of Nallamalais, steps such as ban on fishing during the spawning season should be strictly be implemented.

2.6.6. Arachnids and Mantid:

Arachnids are predators and play an important role in maintaining the ecological balance. Most of them are nocturnal and feed on insects and small vertebrates. The members are found to live in almost all possible habitats. In view of their habits, they are considered to be an agent in the biological control of insects. Spiders are considered to be one of the best friends of mankind, because they feed on insects which are generally harmful to man and domestic animals. They play a significant role as predator in controlling pests of cotton, apple, banana and rice.

About 63 Species of Arachnid fauna are found in this reserve, which comprises seven (7) species of Scorpions, one (1) species of Amblypygi (Whip Spider), two (2) species of Uropygi (Whip Scorpion), two (2) species of Solifugae and fifty-one (51) species of Spiders. Some are very rare and important species of arachnids like Emperor Scorpion, Tarantula spider, Whip scorpion and Whip spider are found in this reserve. These include three new species of arachnids i.e. one Whip scorpion (*Phrynichus andhraensis*), Tarantula spider (*Poecilotheria nallamalaiensis*) and Tommy spider (*Tmarus srisailamensis*).

2.6.7. Insect Diversity:

NSTR has a rich insect faunal diversity (about 329 species so far identified) because of good tropical forest and good number of perennial water resources. The insects are broadly grouped by their nature as neutral or indifferent insects, injurious insects, useful insects and beneficial insects. Some insects like Honey Bees useful because they give honey and bee wax and beneficial to crops due to cross pollinating nature.

Beneficial insects in NSTR: Most of the insects provide food, clothing, medicines, wax, lac, dyes and many valuable products. Honey, a wholesome food for man, from time immemorial, is produced by the honeybees and is extensively used in industry and medicine. The common predators like the praying mantids, dragonflies, cicindelids, scarabids, ladybird beetles, hornet wasps, ants, robber flies, etc. systematically hunt for and destroy thousands of grasshoppers, crickets, flies, mosquitoes, caterpillars, aphids and numerous other injurious insects every hour of the day. These tireless predators eradicate agricultural pests, which can also be well controlled by other insect predators. They often destroy noxious weeds in garden, field and orchard (which we are unable to eliminate inexpensively) and thus help in increasing the production of flowers, crops, fruits and vegetables. The plants have in reality evolved their flowers exclusively for

the purpose of attracting specific insects, luring them with sweet foods and then making them carry the pollen grains from one flower to another and depositing part of the pollen load on the receptive stigma of another flower, which they visit next. These plants are known as endogamous and their pollination is called entomophily.

Injurious insects in NSTR: Some of the insect pests cause considerable damage to the plant community. Locusts are obviously the main injurious insects. Next to them are termites, the most destructive insects to the forests. They destroy trees, timber, and wood, wooden furniture and household articles. Thus, they act as decomposers in the food chain. The larvae of various moths suck the sap from fresh and younger leaves and cause leaf fall and stunted growth.

Ecological significance of insects in NSTR Sanctuary: The lady bird beetle, which is a predator of the scale insect *Pericerya purchasi,* soon brought it down to a harmless level. The *Trichogramma* egg parasite controls the growth rate of moth borer caterpillars. The predators and parasites play a key role in ecological food web. The special advantage in their use is that they are highly selective in killing and not indiscriminate like insecticidal sprays and dusts. These beneficial insects maintain the ecological equilibrium. The estimated total economic loss by insect damage to crops, fruits, livestock, raw material, manufactured goods, human health, etc., is only a small fraction of the grains, fruits and vegetables and fodder raised by insect pollinators for the use of man.

2.6.8. Rare and new species:

There are 11 species of Mammals, 2 species of birds, and 3 species of reptiles which are found to be rare. Research inventories discovered 10 Herpetofauna, 18 mantids, 12 arachnids as new reports to Andhra Pradesh.

2.6.9. Limiting Factors for density of animals:

Limiting factors acts through habitat and results in keeping check on animal population, their distribution and such other factors.

a) Food: -

Generally, in this Protected Area food is a limiting factor. The fodder is available during the rainy season and 2-3 months after the rainy season. Later on, tender grass is not available for herbivores and they survive on browsing of branches, young twigs

and animals have to take less preferred food items. They are also seen feeding on fallen leaves of Bamboos. In this season, flowers of Mahua and Palash and fruits of Tuniki, Are, Mango and Mahua become source of food for many species.

b) Water:

Water in summer season becomes scarce and is available at a few places only. So, water is also a limiting factor, but the water management has reduced its gravity to a large extent. It is for this reason that similar works need to be continued to create a uniformly distributed system of waterholes.

c) Cover:

Cover is not a limiting factor in this Protected Area. From the information of animal species found here it can be said that their requirement of cover is met with.

2.6.10. Faunal Rehabilitation and Translocation Program

2.6.10.1. Release of Captive Bred Crocodiles:

Due to construction of Srisailam Dam and Nagarjunasagar, the endemic mugger crocodile population in Krishna River is disturbed and below Srisailam dam their population becomes rare. During February 1977, under Mugger Rehabilitation scheme organized with the assistance of UNDP, one male and 3 females were introduced at Ethipothala. The first ever release of captive reared Mugger (1 male and 2 females) in Asia, took place in the sanctuary at Ethipothala and 2 females and 2 males were further added during 1978 and 1980, By 1980 they started breeding in Nature. About 419 Mugger Crocodiles (Males-75, Females-344) brought from Nehru zoological Park was released in different parts of the river Krishna within the sanctuary from 1977 to 1998. Now, the status of the population has to be ascertained in the Krishna River.

2.6.10.2 Rehabilitation of Indian Star Tortoises (*Geochelone elegans)*:

The Singapore and Malaysian Wildlife Enforcement Authorities made several confiscations of Indian star tortoises while being illegally transported. Government of India agreed for repatriation and with the support from the Central Zoo Authority (CZA) and Wildlife Institute of India developed a network with the Andhra Pradesh Forest Department and organized an integrated ex situ conservation project to rehabilitate the tortoises back into the wild. From DNA inventories, the Center for Cellular and Molecular Biology (CCMB), Hyderabad confirmed the origin of the

confiscated stock was of southern Indian origin. A total of 480 Indian Star Tortoises were released in this tiger reserve. About 320 Tortoises were released in Pulicheruvu locality on 28.01.2004 and on 13.12.2005. About 160 tortoises released in Naramamidi Cheruvu on 16.12.2004. Prior to release, all individuals were physically marked by marginal scale clippings. One third of the star tortoises that were released implanted with passive transponder chips (Trovan Model - ID 100). The transponder chips were implanted at the base of the hind limbs using a Trovan passive transponder injector. Post release monitoring has been taken up for study of long-term adaptation and protection measures.

2.6.10.3 Translocation of Blackbuck *(Antelope cervicapra)*:

The strict enforcement of Wildlife (Protection) Act, 1972 proliferated the population of the herbivores, especially the Blackbuck. Crop damage by the Blackbuck has become a major problem in Kurnool District and induced severe man-animal conflict. Finally, Government of Andhra Pradesh decided to capture and translocate them into this Tiger Reserve, which is holding natural populations in Vijaypuri South Range. A novel technique of capturing and translocation of highly sensitive Blackbuck without any injury or mortality was developed. About 3000 Blackbuck were captured and about 2750 translocated from the affected mandals of Kurnool District into Sirigiripadu Section of V.P. South Range, Markapur Division. This operation started from 1.4.2005 and ended 31.3.06. Post release monitoring simultaneously has been taken up for study of long-term adaptation at the rehabilitated site. Habitat evaluation using Geomatics and population estimation.

2.6.10.4. Feral or introduced species:

No feral species exists in this Tiger Reserve. Nevertheless, during 1924, a pair of Cheetah was reportedly introduced in Kolhapur Forest adjoining sanctuary by then Rajah of Jatpole but their whereabouts since then are not known. During 1988 Municipal authorities of Hyderabad captured about 100 Rhesus monkeys and released them in Forest near Mannanur. Now they have turned into wayside beggars for food and literally stop the vehicles by congregating whole width of the road at many places right from Mannanur of Amrabad Tiger Reserve to Dornala area.

2.6.10.5. Interesting associations and interactions:

Movement of Tiger and Leopard is found around Cattle camps quite frequently. One Tiger almost constantly associating with one cattle camp (migratory) is observed with the onset of monsoon. On Krishna Banks, Yepi is lopped heavily for cattle. Spotted deer favours such areas for supplementary feed. Sambar and Chowsingha association is common. Intra-species interactions are rare except in carnivores, Hyena, Fox, Jackal, Mongoose and Civets are found to associate with Tiger and Leopard movements. In one case, a Tiger killed a Leopard in a fierce fight near Srisailam. Also, near Amrabad one tiger and a male wild boar fought and both died due to serious injuries.

2.6.10.6. Seasonal phenomena *viz.*, migration, nesting, fawning, swarming etc.:

This tiger reserve has a habitat with modest 101 butterfly species and 137 species of moths. The butterflies occur seasonally with most species becoming active between pre-monsoon showers and late winter. However, some freaks such as the spot sword tail may be active during summer in the riparian patches. The other common butterflies in this habitat includes Rings, Grass yellows, Oranges, swifts and other grass feeding skippers etc. Bush browns, Rings, Pancy's and Grass Yellows are common in Bamboo dominant in this region. The existence of Pioneers, crimson tips, silver lines and smaller orange tips are the indicators of scrub and savanna types. Butterflies like Grass blues, and Grass jewel, painted lady, Blue Pancy and mottled emigrant is abundantly found in secondary habitats of grass lands affected by livestock grazing and annual fires.

During pinch period, most of herbivores as well as carnivores migrate locally to valleys where perennial water flow is found. The general fawning season is around June to August every year. Migratory birds, like Flamingoes, Bar-headed geese, Demoiselle cranes, Pochards, Pintails, and teals visit aquatic areas of this Reserve from August onwards. Many more local migrants like Hoopoe and Spot bills are also seen in summer season. Another winter visitor is Redstart. During 1985-87 gregarious flowering of Bambusa induced increase in gallinaceous bird population. Crocodiles start nesting by April and young ones come just before monsoon starts. The swarming of ants and termites is seen with onset of first showers in the area. Spring is the nesting season for many ground birds and chicks come out by July to August with the arrival of monsoon, when food availability is maximum with swarming insects and pests.

2.7. HABITAT:

Out of four main Eco-floristic zones found in Andhra Pradesh, the Core area of the Project Tiger comes under Zone IV d2 and Vc. This categorization is based upon Bio-climatic criteria that lead to main vegetation types ("Eco-floristic zones map of Tropical Asia" FAO, 1989).

2.7.1. Edges and Ecotones:

South of River Krishna - Pecheruvu and Guttalachenu plateaus have ideal ecotones for wild animals. Transitional types between dry deciduous forest and thorn forests provide maximum Ecotone effect and harbor deer, Antelope and gazelles.

2.7.2 Presence and adequacy of cliffs, Ledges, Caves, dens etc.:

The Nallamala hill ranges in the Core area with valleys and gorges is an ideal habitat with more than adequate number of cliffs, ledges and caves for the various kind of fauna especially carnivores and small mammals. Such areas are common along riverbanks of Krishna.

2.7.3 Fodder species and forage conditions:

Plenty of fodder is available in 70% of the reserve in the form of grasses and browseable material, but fire makes the situation uncongenial for herbivores and for their multiplication. The situation is now improving in the wilderness area due to prohibition measure from fires. In Eastern part of Core area around Nagarjunasagar area, forage availability is inadequate.

2.7.4 Natural saltlicks, wallows, shallow pools and water etc:

Natural saltlicks are scattered all over the core area. Animals are seen on the edges of shrinking water holes forming wallows in hot months. Mainly Sambar is seen on the wallows.

2.7.5 Cover, undergrowth, grass etc.:

In the Western parts, cover is adequate in the Core area with sufficient undergrowth and grasses which provide shelter and cover to various fauna. *Lantana camara* forms good cover for gallinaceous birds and Tiger around Pecheruvu. Bamboo clumps form good cover in most of the areas. Tall grass (upto 2m) provides good cover. Undergrowth is heavy towards north of Krishna and provides good habitat for Tiger and its prey.

2.7.6 Frequency and Distribution of large and old trees:

Large trees though less in number are distributed almost uniformly all over the Core area except in eastern parts of Core area. Particularly tree species such as *Terminalia, Tamarindus, Hardwickia binata*, *Givotia rottlerformis* and *Bosewellia serrata* are found all over the plateaus.

2.7.7 Aquatic habitat:

River Krishna with the Srisailam and Nagarjunasagar Reservoirs and large tanks like Pecheruvu provide good aquatic habitat for residential as well as migratory birds. Krishna River is the habitat for Mugger Crocodile (*Crocodylus palustris*), Smooth-coated otter *(Lutrogale perspicillata*) and many varieties of Fishes and Amphibians. Flocks of Demoiselle cranes and Bar-headed geese are seen near Nagarjuna Sagar during January.

2.7.8. Medicinal Plant Resources:

NSTR has carried out a Rapid Assessment Survey in 1998 to assess the potential of medicinal plant resources. Assessment reveals that about 353 species in 88 families that are found in NSTR are known to have medicinal properties. Teams have also documented the ethno-botanical knowledge from local tribes related to 88 families of medicinal plants that were recorded. The following families contain the species and the number of plants is shown in the brackets. Fabaceae (26), Rubiaceae (19), Euphorbiaceae (18), Mimosaceae (18), Caesalpinaceae (15), Acanthaceae (11), Asclepiadaceae (11), Asteraceae (11), Cucurbitacea (10), Solanaceae (10) share the larger proportion of medicinal plant species. Critical analysis of the status of medicinal plant wealth of NSTR reveals critically endangered species (10), Endangered species (21), and Vulnerable (27).

2.7.9. Grasses:

Grass potential in Nallamala is very high and occurs in 90% of the catchment area. Dense grass occurs in 30% of the area and scattered occurrence in 20%, but pure grasslands are scanty in this Reserve. Mostly, one can find the woodland savannas. About 66 taxa of grasses are found to exist. Volume/ha in dense grass areas is 23.7 cum, in scattered 25.2 cum, and in medium 28.9 cum.

Species of grass:

Though there are around 317 species belonging to Poaceae, Zingiberaceae, Commelinaceae and Cyperaceae present in the Reserve, predominantly (53) species of grass occur in this catchment. They are *Amphilophis pertusa, Apluda aristata, Aristida depressa, Aristida hystix, Aristida setacea, Brachiaria distachya, Brachiaria eruchiformis, Chloris barbata, Commelina kurzil, Commelina obliqua, Cyanotis cristata, Cymbopogon coloratus, Cymbopogon polyneures, Cynodon dactylon, Cynodon barberi, Cyperus castaneus, Digitaria chinensis, Digitaria longifiora, Eremopogon feveolatus, Heteropogon contortus, Imperata cylinerica, Ischaamum rugosum, Paspalidium flavidum, Saccharum arundinaceum, Sorghum cernum, Sorghum halepense, Sporobolus orientalis, Sporobolus tremulus, and Vetivaria zizanoides.* Thatch grass i.e.., Bodha occurs in 33% area and the fodder grasses like Nendra, Spear grass and other species occur in 57% of the area. The highest Vol /ha (37 cum) is attained in areas where Spear and Pinjaru grasses are predominant. The lowest volume is found in Bodha grass areas. The quality of grass is highly nutritious. *Shiema* and *Heteropogon* species form major composition of palatable grasses. *Heteropogon* becomes unpalatable after rains.

2.7.10. Major Conspicuous changes in the habitat since inception:

- Nallamalais is a contiguous patch of forested landscape with tropical mixed dry deciduous vegetation protected by declaration of two very important sanctuaries covering over large tracts. Added to this recognition as Tiger Reserve, further accelerated special protection measures brought significant changes in the habitat.
- There is a significant increase in the vegetation status after stopping the Bamboo extraction in the sanctuary limits since 1999.
- The moisture regime of the soils has substantially increased due to various soil and moisture conservation activities taken up under various schemes, which has also contributed towards the improvement in vegetation.
- The analysis done by APFD Geomatics Center also reveals the increase in groundwater table, which in turn improved the groundwater levels in adjoining villages where dry crop cultivation is replaced with the wet crops.
- The increase of fodder, browse and water proliferated the population of herbivores and contributed the increase in the population of the carnivores especially the TIGER-the flagship species of Nallamalais.

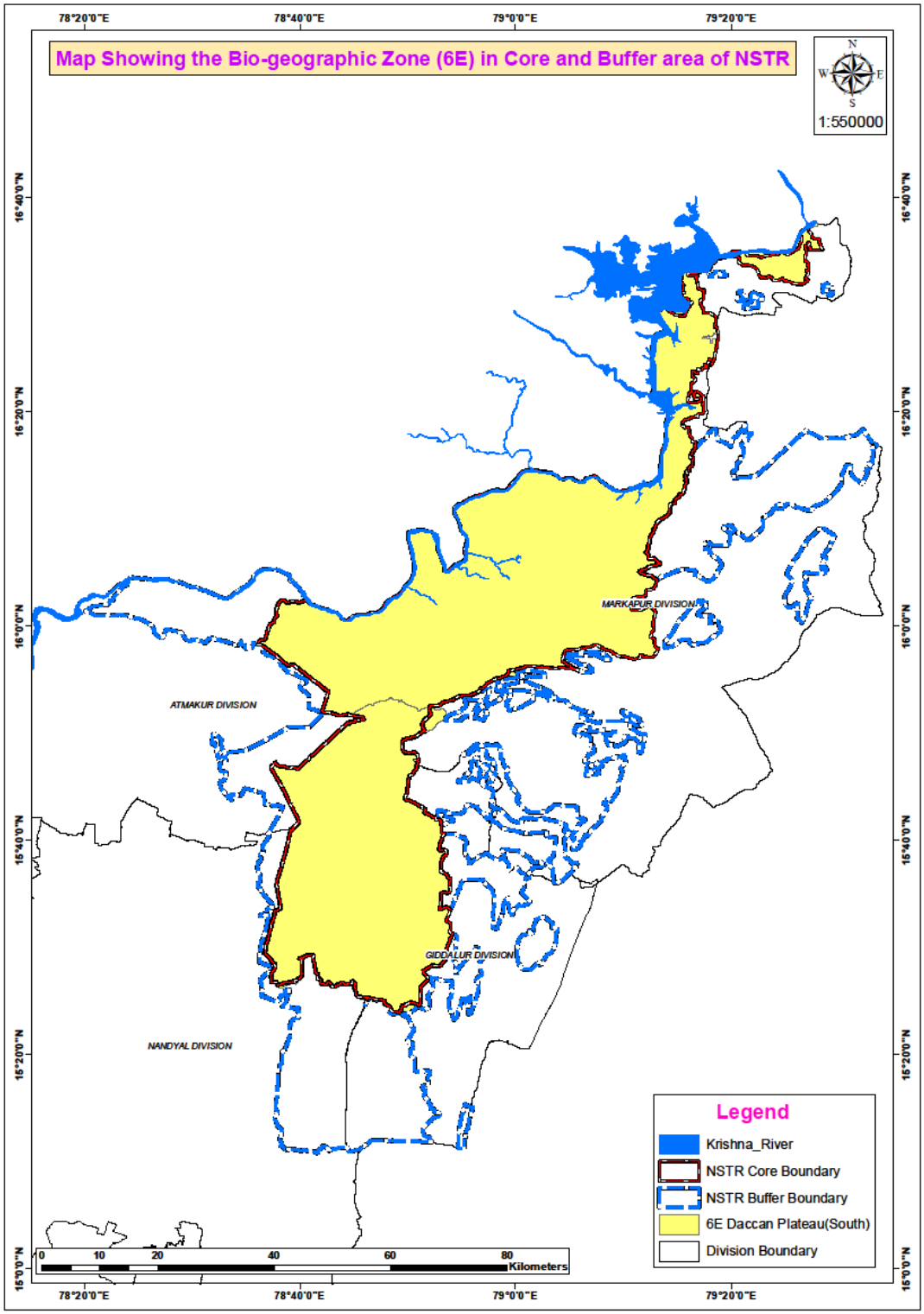
2.8. MAN-MADE FORESTS AND EFFECTS ON HERBIVORE POPULATION:

In the right flank from 1903, Teak plantations on small areas have been taken-up under conversion working circle. On left flank the earliest plantation of teak was taken up during 1959. Various attempts were made before 1976 to raise soft wood plantation of *Eucalyptus,* Silver oak*, Bamboo, Sissoo, and Acacia auriculiformis*. It is observed that only plantations in small areas carried out in the beginning of this century in Nandyal District are most successful. But in general, plantations are not successful in these areas. The local settlers settled in Siddapuram (Nandyal District) started felling of Teak elites to gain quick returns. Thus, the effects of man-made forests in creation of blanks in the forest are sometimes suitable for herbivores (edge effect or ecotones). This is manifested in spotted deer population around Pecheruvu plantation areas.

2.9. BIO-GEOGRAPHICAL CLASSIFICATION:

- The Core area of NSTR is in the biotic provinces of zone (6) of the Deccan peninsula i.e., 6D and 6E.
- Extensive forest areas along the river allow the development of genetically viable populations.
- The forests in core area consists mostly a mixture of *Hardwickia, Chlorxylon* or *Albizia* communities
- Faunal elements include Tiger, Leopard, Sloth bear and typical dry land predators – wild dog and Jackal; prey species like Sambar, Chital, Chowsingha, Nilgai, Mouse deer, Wild boar and Chinkara. The river Krishna has Mugger, Otters and Turtle populations.

Map-9: Map showing Bio-geographical Zone (6E) in Core area of NSTR



CHAPTER – 3
Tiger and Co-Predators



3.1 DISTRIBUTION:

The distribution of animals in any area is directly dependent upon proper interspersion of various plant communities and juxtaposition of habitat units i.e. food, water, and cover. The wild animals in NSTR show concentrations in certain parts, particularly in certain areas of Gundla Brahmeswaram of Atmakur and Markapur Divisions. Sambars are essentially the animals of hilly country seen across the Reserve which is the main prey of the Tiger. Chital prefer edges of grassy forests and Bamboos. They inhabit topography ranging from flats to gentle undulations and are seen in meadows and near to fringes. Nilgai or blue bull prefers grass and patches of scrub preferably, and is seen in Markapur Division areas particularly in Palutla and Nekkanti areas. Chinkara is also seen in these specific areas of Palutla and Nekkanti areas. Chevrotain or Indian Mouse Deer are seen mostly in Gundla Brahmeswaram and other moist shady places. It inhabits places where water availability is ensured round the year.

Leopards thrive in all types of habitats, with special preference for small prey, viz. Hanuman langur (*Semnopithecus entellus*), wild pig1 (*Sus scrofa*), grey junglefowl (*Gallus sonneratii*), etc. They are often sighted on the edges of forests.

Sloth bears are well distributed throughout the Reserve and mostly occupy hilly, rocky outcrops with areas occupied by mahua/ippa (*Maduca indica*), jamun (*Syzygium cumini*), fig (*Ficus* species), maredu (*Aegle marmelos*), tuniki (*Diospyros melanoxylon*), mango (*Mangifera indica*) trees, and also insects, particularly termites. They exhibit special interest in honey and mahua flowers and excavate termitaria. Claw marks of climbing up on a tree like Arjun for honey are frequently seen.

Wild pigs are seen in moderately open forest but are mostly concentrated in areas adjoining agricultural fields. Wild dogs are widespread and seen in good numbers. They need adequate water, shade, and food such as langur, sambar, chital, etc.

Langurs are seen inhabiting forest covers in association with chitals. But rhesus macaques are seen on the outer fringes of the forest and also near human habitations. They have undoubtedly proved to be a menace.

3.2. ABUNDANCE STATUS:

The key predator, "the Tiger," is distributed throughout the core area of Nagarjunasagar Srisailam Tiger Reserve; there may be seasonal variation depending upon the presence of water. Seventy-four individual tigers have been camera-trapped in the core and part buffer in the landscape during the year 2023. The Nagarjunasagar Srisailam Tiger Reserve was bifurcated in 2014 along with the reorganization of the states of Andhra Pradesh and Telangana. The part of the Tiger Reserve towards the northern side, in the state of Telangana, is renamed as Amrabad Tiger Reserve. The trend in tiger population in Nagarjunasagar Srisailam Tiger Reserve is as follows:

Table 5: Trends in Tiger population in NSTR over the years

a) As per All India Tiger Estimation

All India Tiger Estimation (Phase-III) (Every 4 years)	Estimation of Minimum Tiger Numbers
2006	95 (84-107)
2010	72 (65-79)
2014	68 (58-78)
2018	48 (40-56)
2022	63 (58-70)

Table 5 (b) Phase IV Tiger Reserve Level

Phase IV (Every year) Tiger Reserve level	Estimation of Minimum Tiger Numbers
2014	37
2015	40
2016	46
2017	46
2018	47
2019	63
2020-22	73
2023	74

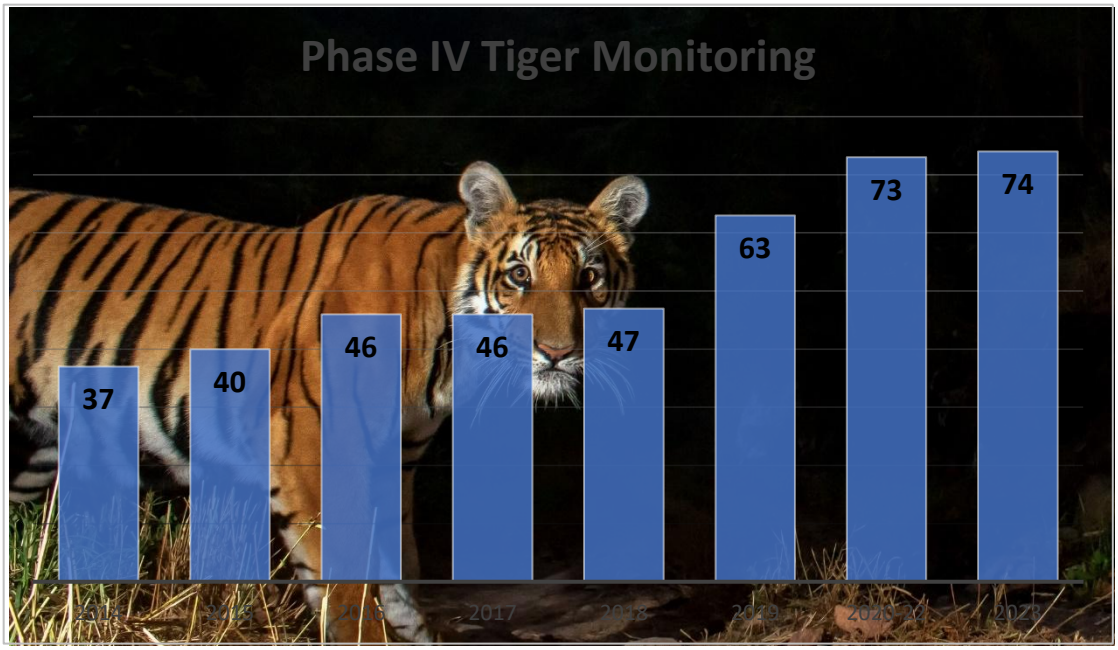


TABLE 6: Statement Showing the Range-wise NSTR Tigers from 2022-2023 to 2023-2024

Statement Showing the Range-wise NSTR Tigers from 2022-2023 to 2023-2024					
Sl.No.	**Name of the Division**	**Name of the Range**	**2022-23**	**2023-24**	**Remarks**
1	PT, Atmakur	Atmakur	7	9	Tigers will move from one Range to another adjacent range & Divisions For the year 2022-23 74 Individual Tigers and 6 Cubs were Captured For the year 2023-24 76 Individual Tigers and 11 Cubs were Captured,
		Srisailam	10	10	
		Nagaluty	13	13	
		Velgode	9	9	
		Bairluty	4	6	
2	PT, Nandyal	Bandi Atmakur	1		
		GBM	4	8	
		Nandyal	3	2	
3	PT, Markapur	Markapur	5	2	
		Dornal	4	4	
		Korraprolu	6	4	
		Nekkanti	9	16	
		G.V.Palli	11	10	
		Y.palem	4	5	
		V.P.South	6	5	
4	PT, Giddalur	Thurumella	11	9	
		Gundlakamma	1	8	
		Giddalur	7	3	
			115	**123**	

3.3. PREY PREDATOR RELATIONSHIP:

Tigers in NSTR have a varied diet due to habitat and terrain types. The most important prey species were found to be spotted deer and sambar in both the southern and northern parts of the reserve, with high dietary niche overlap. The sambar is more commonly found in the hills or at water areas at the base of hills, while chital and wild pigs are more commonly found in the flat terrain and near forest fringes. In this way, the hunting grounds are continuously being cycled. The relatively low prey density may necessitate the tiger's constant movement. Low prey density may also force the tiger to go for smaller-sized prey such as langur and four-horned antelope, and rarely bear and porcupine. In several places along the trails, tigers routinely killed larger livestock (primarily buffaloes), like Bilvavanam and Hatakeshwaram in the Srisailam range, and leopards prefer smaller livestock (calves and goats) in Pecheruvu. In the

Srisailam range, there are instances of leopards scavenging tiger and wild dog kills. Scat analysis of the tiger also needs to be done to assess prey consumption across the area. Tigers prefer large prey like sambar and blue bull, while cheetal is preferred by leopards and wild dogs.

3.3.1. Monitoring Prey and Predator in NSTR:

Camera traps have been used exclusively to identify the tigers in the study area, as per the guidelines issued by the National Tiger Conservation Authority, New Delhi. The study area has been divided into grids of 1.415 km x 1.415 km (2 km²). Two automatic cameras were placed on either side of the trail in each selected location to photograph both flanks of the tiger for proper individual identification. The NSTR area has been divided into two blocks, i.e., Block-I and Block-II, for organizing the camera trap exercise during the year 2020–22. Each camera trap was given a unique number, and all locations were plotted on map layers to organize data generated by each camera trap. GIS layers have been used for this purpose. The closure period is taken as 40 to 45 days, as prescribed by NTCA. G.V. Palli, Y. Palem, Dornal, and VP South ranges of Markapur division; Naguluty, Bairluty, Velgode, and Srisailam ranges in Atmakur division; and GBM areas are observed to have higher density when compared to the rest of the area of the Tiger Reserve.

The details of blocks, number of camera traps, along with all the details of district, division, range, number of cameras fixed, and schedule of dates are given in Table 11. The maps of NSTR, which show the grids, locations of camera traps in core, buffer, and corridor, and the number of tigers present in the various blocks, are also shown.

Table 7: - Block-wise, division-wise, range-wise camera traps fixed and schedule of dates

Block No.	District	Division	Range
Block-I	Nandyal	Atmakur	Atmakur, Nagaluty, Srisailam
	Prakasam	Markapur	Dornal, G.V Palli, Y.Palem
	Guntur		V.P South, Nekkanti, Korraprolu
Block-II	Nandyal	Atmakur	Bairluty, Velgode,
		Nandyal	Nandyal, GBM, Bandiatmakur, Chalama,
	Prakasam	Markapur,	Dornal,
		Giddalur	Gundlakamma, Turimella
	Nandyal	Nandyal	Rudravaram, Chalama,

	Prakasam	Giddalur	Giddalur, Gundlakamma,
	Kadapa	Kadapa	Ontimitta, Siddavatam, Kadapa,
			Rayachoti, Badvel, Proddutur Onipenta, Porumamila

3.3.2. Timeline and Action Plan for Phase –IV Monitoring in NSTR & Corridor-2022-23

NTCA and WII jointly issued mandatory field guidelines to do camera trap in every Tiger Reserve Forest for each year. A detailed protocol, requirements and mandate has been provided for. As per the Phase IV protocols camera trapping is to be undertaken in an extent of 400 Km^2 (intensive core area of tiger reserve) for 40 to 60 days. According to the protocol, area of NSTR has been divided into two blocks, i.e., Block-I and Block-II. In the first phase, the camera trap was commenced from 20th of February in Block-II, followed by Block-I of NSTR & Corridor.

Table 8: Details of the divisions and ranges covered under Phase-IV camera trap and data collection

Name of the Block	Name of the Division	No. of ranges covered	Name of the Ranges	No. of camera trap locations	No. of cameras fixed
Block-1	Atmakur	3	1.Atmakur	49	98
			2.Nagaluty	70	140
			3.Srisailam	66	132
	Markapur	6	1.Dornala	33	66
			2.Korraprolu	20	40
			3.G.v. pally	93	186
			4.Y. Palem	28	56
			5.V.P. South	26	52
			6.Nekkanti	31	62
	Total			**416**	**832**
Block-2	Markapur	2	1. Markapur	28	56
			2.Korraprolu	27	54
	Atmakur	2	1.Velugodu	57	114
			2.Bairluty	54	108
	Giddalur	2	1.Gundlakamma	46	92
			2.Thurimella	37	74
	Nandyala	4	1. GBM	13	26
			2.Nandyala	27	54

			3.Bandi Atmakur	16	32
			4.Chelama	8	16
	Nandyala (Corridor)	2	1. Chelama	15	30
			2. Rudravaram	25	50
	Giddalur (Corridor)	2	1.Gundlakamma	14	28
			2. Giddalur	15	30
	Kadapa	7	1. Vontimitta	14	28
			2. Sidhavatam	28	56
			3. Kadapa	14	28
			4. Badwel	11	22
			5. Porumamilla	16	32
			6. Onipenta	8	16
			7. Proddatur	2	4
	Annamayya	3	1. Chitvel	13	26
			2. Rayachoti	5	10
			3. Balapalli	15	30
	Tirupati	2	1. Bhakrapeta	2	4
			2.Tirupati	5	10
Total				**515**	**1030**
Grand Total				**931**	**1862**

Table 9: Number of Camera Traps available for undertaking the exercise:

S.No	Divisions	Availability of working camera traps
1	Atmakur	460
2	Markapur	357
3	Giddalur	145
4	Nandyal	179
5	Kadapa	133
Total		**1274**

3.3.3. Coordination and Preparatory Meetings:

Coordination and Preparatory meetings with DFOs, FROs, FSOs and FBOs of Block-1 and Block-2 of NSTR & Corridor.

Table 10: Capacity Building / Training Schedule:

S. No	Activity	Blocks		
		Block-2	Block-2	Block-1
1	Date of Capacity building / Training	02-02-2023	03-02-2023	03-04-2023
2	DFO's with their frontline staff were attended	DFO's of Atmakur, Markapur, Nandyal, Giddalur, & Their frontline staff	DFO's of Kadapa, Annamayya, Tirupati & Their Frontline staff	DFO's of Atmakur, Markapur and Their Frontline staff
3	Place of meeting	Pacherla Eco-Tourism	Kadapa	Bio-lab

3.3.4. Field Surveys including Camera Trapping:

Table 11: Timeline for camera Trapping and data collection in NSTR & Corridor:

S. No	Activity	Timeline	
		Block-2 (515 Locations)	Block-1 (416 Locations)
1	Commencement of 1st round of camera trapping	20-02-2023	15-04-2023
2	Data collection of 1st round (After 20 days)	11-03-2023	04-05-2023
3	Removal of cameras from the field (After 40 days)	31-03-2023	24-05-2023
7	Action by concerned DFO's	DFOs of Giddalur, Nandyal, Kadapa, Annamayya, Atmakur, Markapur & Tirupati	DFOs of Atmakur & Markapur

3.3.5. Results:

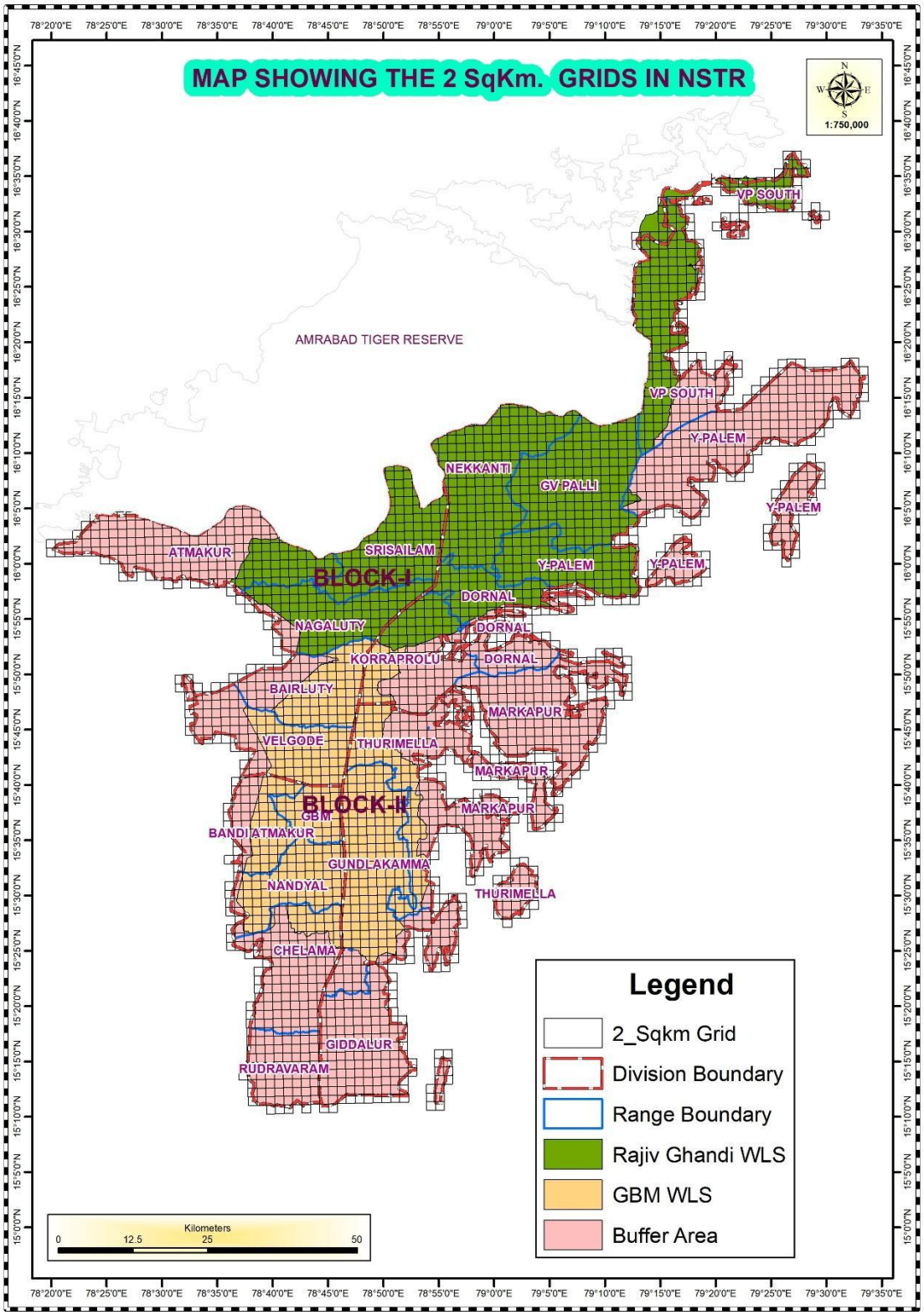
Table 12: Minimum number of Tigers captured in NSTR and Seshachalam Corridor during Phase-IV Camera trap exercise 2022-23

Block	Male	Female	Total	Cubs	Grand Total	No. of Tigers migrated to Amrabad Tiger Reserve, Telangana
Block-1	16	22	38	5	43	10
Block-2	14	22	36	1	37	
Total:	**30**	**44**	**74**	**6**	**80**	

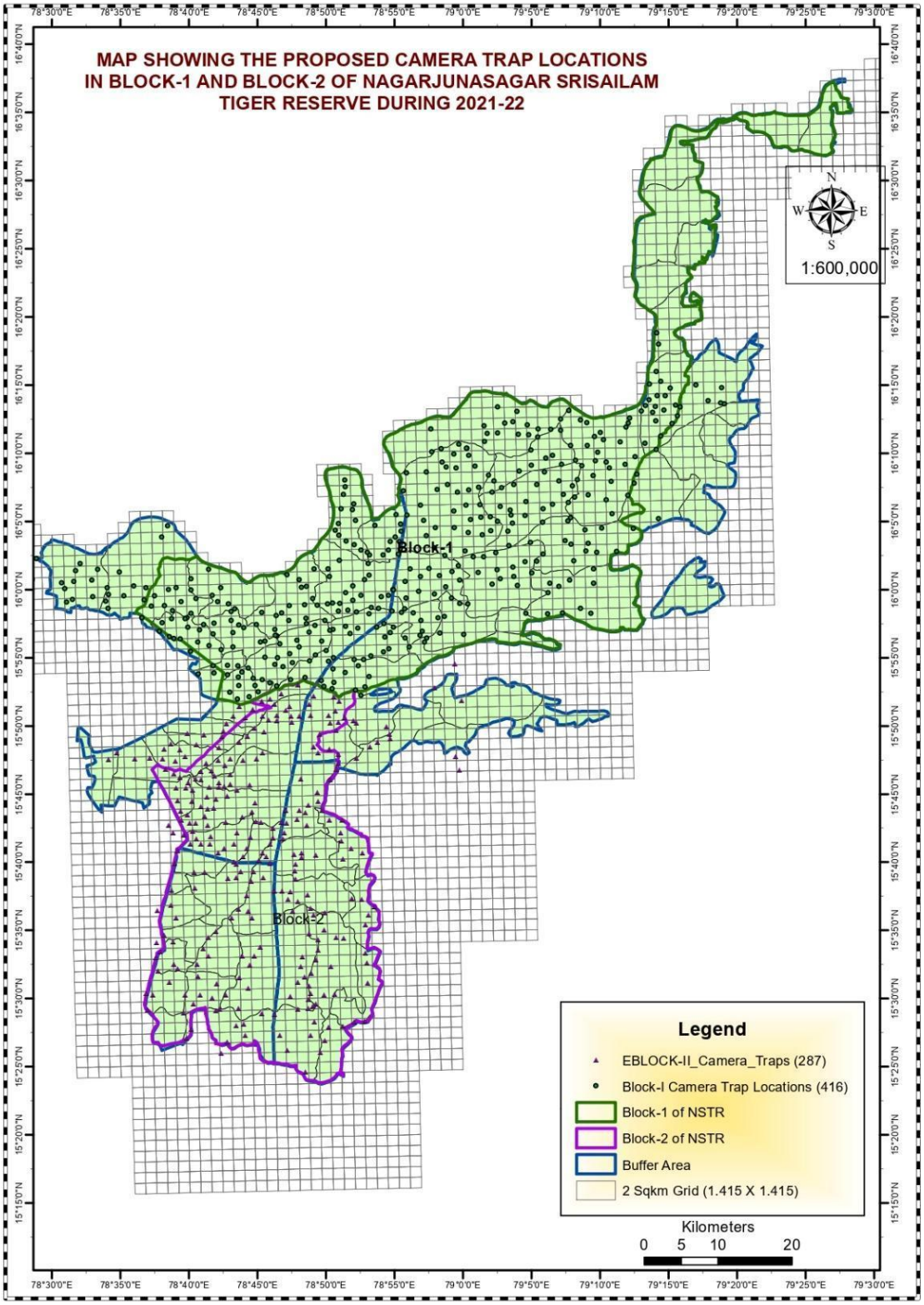
Table 13: Tigers migrated from NSTR to Amrabad Tiger Reserve, Telangana during the year 2021-2023.

Sl. No.	Division	Range	NSTR Tiger ID	Amrabad Tiger Reserve Tiger ID
1	PT, Atmakur	Srisailam	T2 M	T22 M
2			T69 M	T19 M
3			T70 M	T28 M
4			T73 M	T25 M
5	PT, Markapur	G.V Palli	T60 M	T23 M
6			T79 F	T24 F
7		VP South	T101 M	T33 M
8			T100 F	T41 F
9			T102 M	T32 M
10	Nandyal	Chelama	T120 M	T35 M

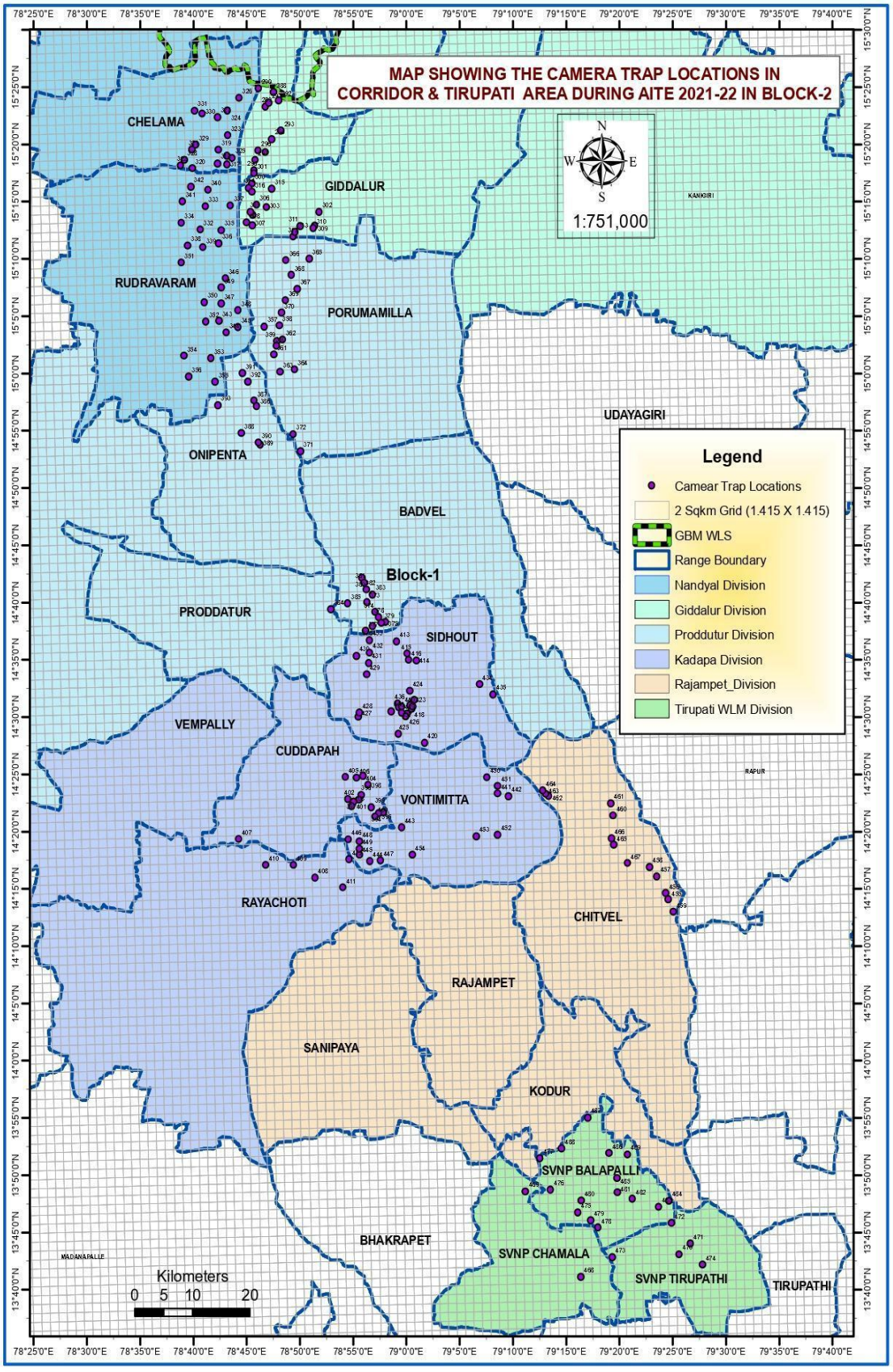
Map-10: Map showing the Grids in NSTR and GBM



Map-11: Map showing the proposed camera trap locations in NSTR



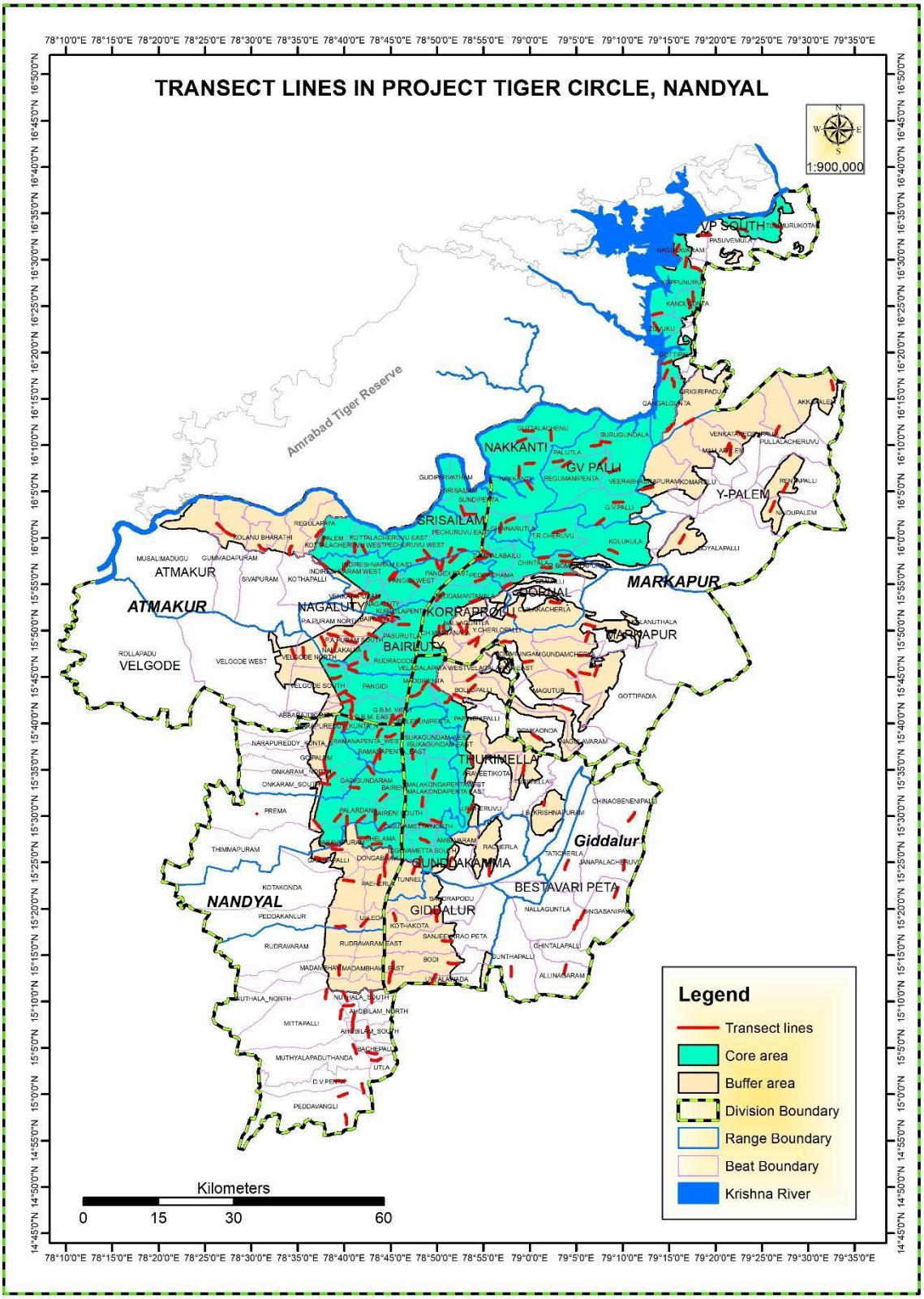
Map-12: Map showing the Camera trap locations in corridor areas



Prey density:

The prey densities were not assessed at regular intervals; however, considering the assessment of Nallamalai Landscape by Conservation Partner, HyTiCoS, the following are the prey densities of the NSTR Landscape. Prey density was assessed thrice in the Nallamalai Landscape based on the line transect method during the years 2019, 2020, and 2022. An area of 1800 km² (from a total of 2444 km² within NSTR) was selected for carrying out the study in the core area of NSTR. Within these study areas, 48 spatially replicated transect lines of 3.2 km length, with a square geometry (800 m per side), were placed in a systematic design with a random start using the survey design module of program DISTANCE (Strindberg et al. 2004, Thomas et al. 2010). These spatial replicates were set 4 km apart. Squares were preferred over other sampler geometries based on logistical conveniences. The replicate length of 3.2 km was set to optimize observer speed, the expected number of detections on each walk, and to avoid observer fatigue (Karanth et al. 2002). Transects were marked in the field by paint marks and tags placed on trees.

Map-13: Transect Locations in Nagarjunasagar Srisailam Tiger Reserve



Based on the All-India Tiger Estimation, prey mass as per the NTCA guidelines and on the Technical Report submitted by HyTiCoS following results were obtained:

The carrying capacity is computed using the

Hayward equation Y=-2.158+0.377x.

Y= log of predicted predator density

X= log of preferred prey biomass

Table 14: Prey Density Year 2010

Preferred prey	Density/sqkm (Mean +_SE)	3/4th average female Weight (kg)	Available biomass kg per sqkm (mean+_SE)
Chital	1.84+_0.97	30	55.2+_29.1
Sambar	3.34+_1.09	150	501+_163.5
Preferred prey biomass= 556.2(+_192.6) Kg/sqkm Predicted Tiger Density= 6.42+_1.005/100sqkm (5-7) Current tiger density= 1.50+_0.27/100sqkm			

Table 15: Prey Density Year 2019

Preferred Prey	Density/ Sq.km	3/4th average female weight	Available Biomass Kg / Sq.km
Chital	0.38	30	11.40
Sambar	3.84	150	576.00
Chousinga	0.67	21	14.07
Wild pig	1.42	32	45.44
Nilgai	0.31	180	55.80
			702.71

Table 16: Prey Density Year 2022

Preferred Prey	Density/ Sq.km	3/4th average female weight	Available Biomass Kg / Sq.km
Chital	0.20	30	6.00
Sambar	2.13	150	319.5
Chousinga	0.99	21	20.79
Wild boar	0.91	32	29.12
Nilgai	0.22	180	39.60
			415.01

Table 17: Predicted Tiger Density

Year of prey density	Preferred prey Biomass	Predicted Tiger Density (Hayward equation) Per 100 Km²	Predicted Tiger Density (Miquelle et.al 1999) Per 100 Km²
2010	556.2 +/- 192.6	6.42+_1.005 or say 5-7	1.70
2019	702.71	8.22	2.01
2022	415.01	6.74	1.40

Predicted Tiger Density
Hayward equation: Y=-2.158+0.377x.
Y= log of predicted predator density
X= log of preferred prey biomass

Predicted Tiger Density
(Miquelle et.al 1999)

$$T_2 = (P_b + 256.3)/476.5$$

Where T_2 is the number of tigers/100 km² and P_b is the prey biomass (kg km⁻²).

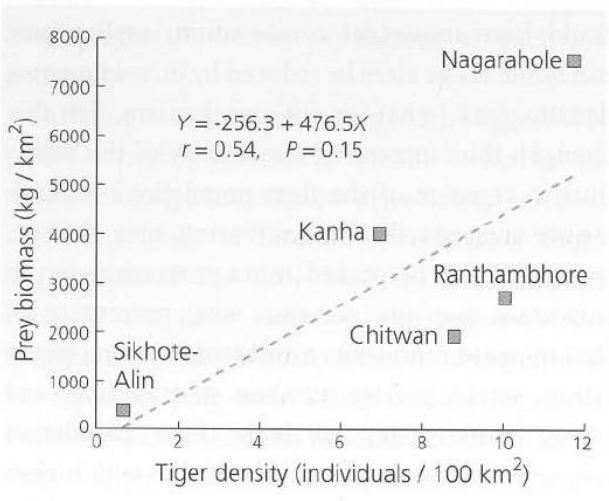


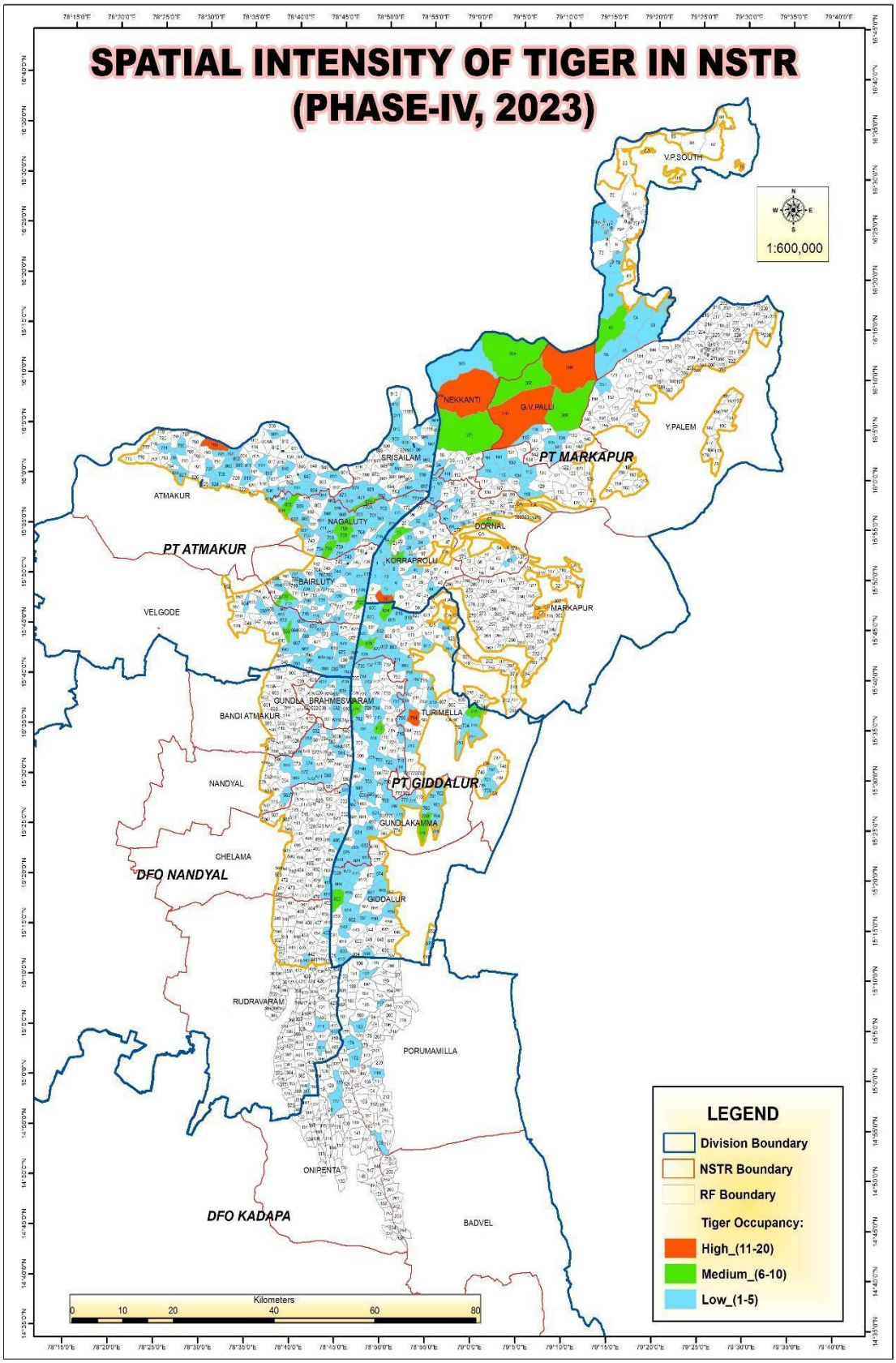
Table 18: Predicted Tiger Density block-wise (latest prey densities in NSTR)

S. No	BLOCK	No. of Tigers	No of Grids of 2 Sq.km	Predator density calculated based on actual area of Grid	Predator density considering over all Tiger Reserve (3727 sq.km)
1	Block -1	18	197 equal to 394 Sq.km	4.56 nos per 100 Sq.km	1.73 no.s per 100 Sq.km
2	Block-2	26	289 equal to 578 Sq.km	4.49 nos per 100 Sq.km	
3	Block-3	20	167 equal to 334 Sq.Km	5.99 nos per 100 Sq.km	
4	Corridor	09	200 equal to 400 Sq.km		
	Total	**73**			

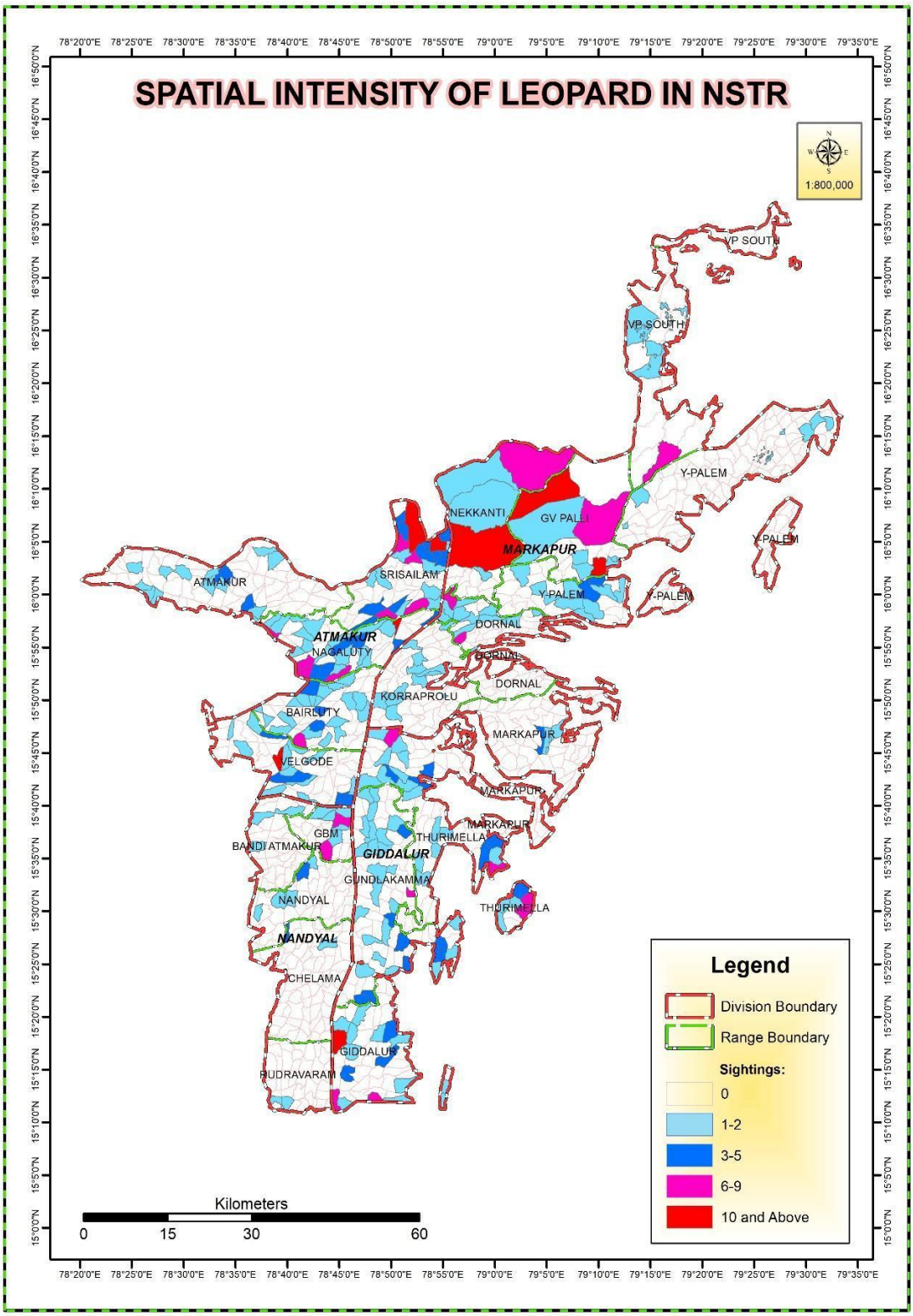
The estimation of prey was not done in a systematic manner in the Nagarjunasagar Srisailam Tiger Reserve since the inception of the Tiger Reserve. This needs to be done on top priority, though 73 individual tigers were present in the landscape of Nallamalais, right from Core to Corridor, having an extent of more than 10,000 sq. kms. The tigers are concentrated in specific localities: G.V. Palli, Y. Palem, Dornal, and V.P. South ranges of Markapur division; Naguluty, Bairluty, Velgode, and Srisailam ranges in Atmakur division; and GBM areas. Due to lack of roads and inaccessibility to many areas of NSTR, camera trapping could not be done in the entire area of the Tiger Reserve. Based on the indirect signs and reports of the sub-ordinate staff, specific areas were camera-trapped. There is every chance of more tigers in the landscape. Prey densities in NSTR (Core) are currently depressed, and the reasons need further investigation. Conservation interventions should be based on proper scientific and ecological knowledge. Management will have to keep track of population trends for tiger and prey to evaluate the utility of various conservation interventions. To assess in a systematic manner, prey density is to be calculated in the entire area of Core as well as Buffer, and in the representative areas of Corridor. Attempts are to be made to increase the camera trapping area of the Reserve.

However, the direct and indirect evidence of the predator and prey species are mapped and placed below.

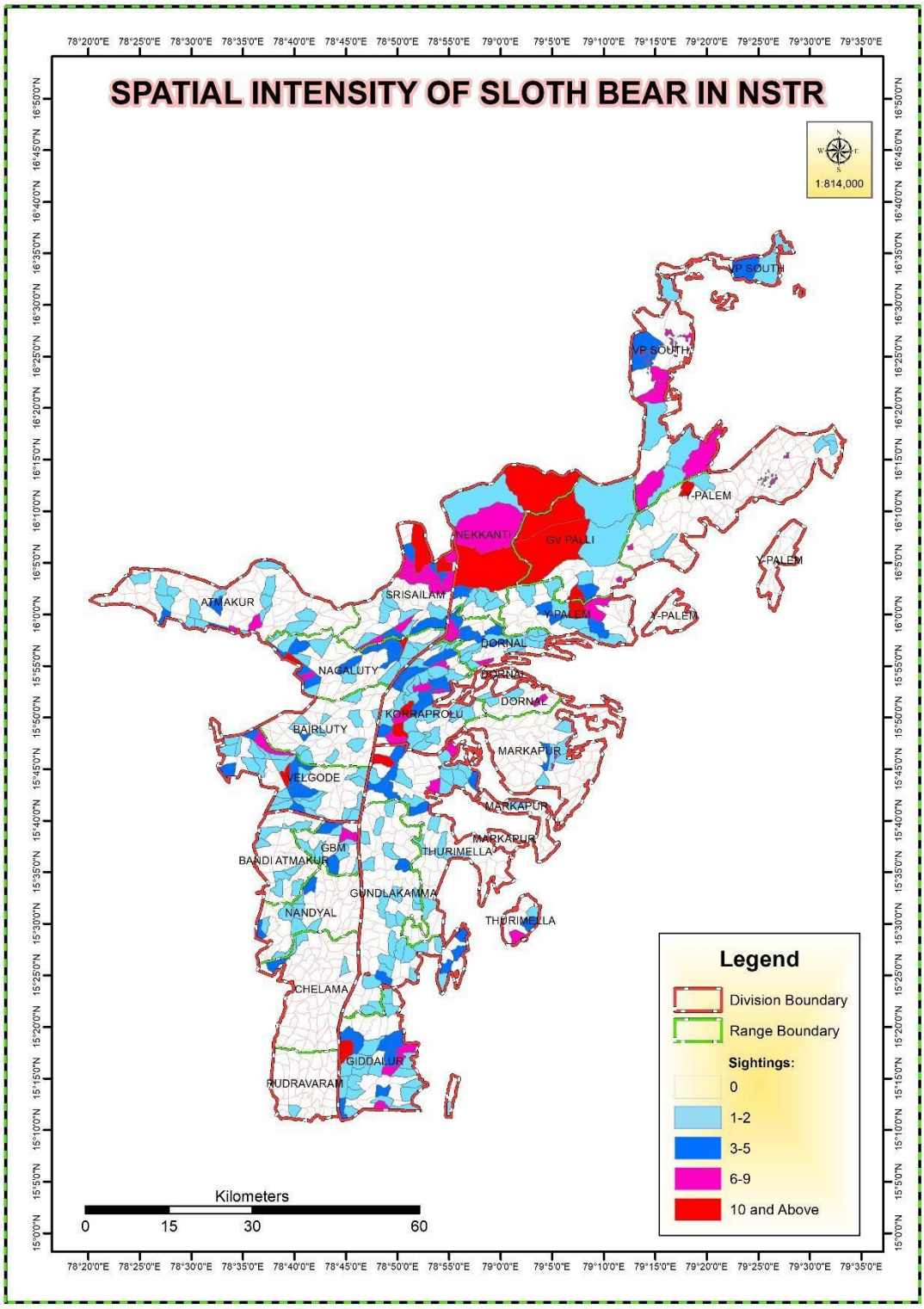
Map -14: Map showing the Spatial Intensity of Tiger in NSTR



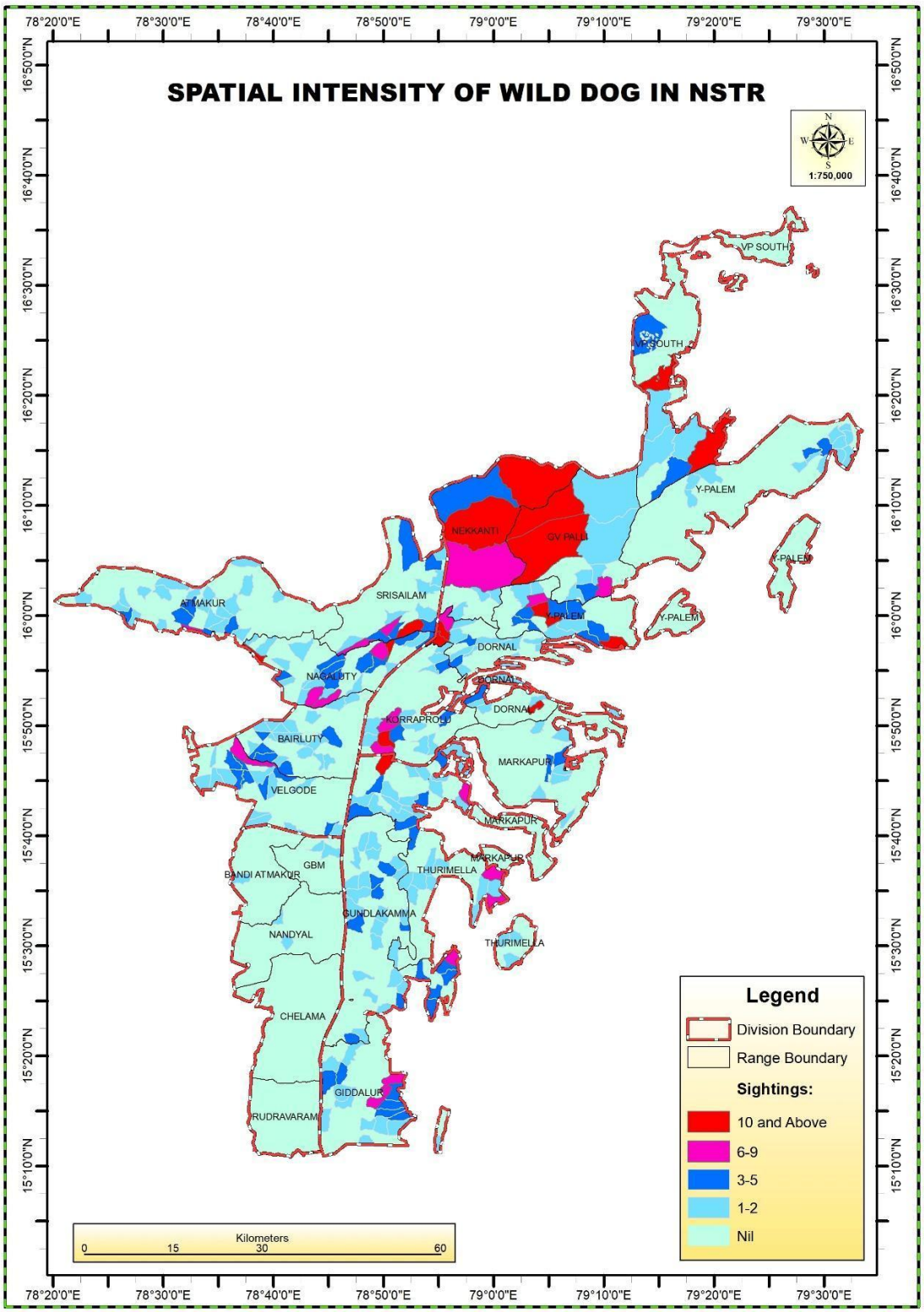
Map-15: Map showing the Spatial Intensity of Leopard in NSTR during 2025



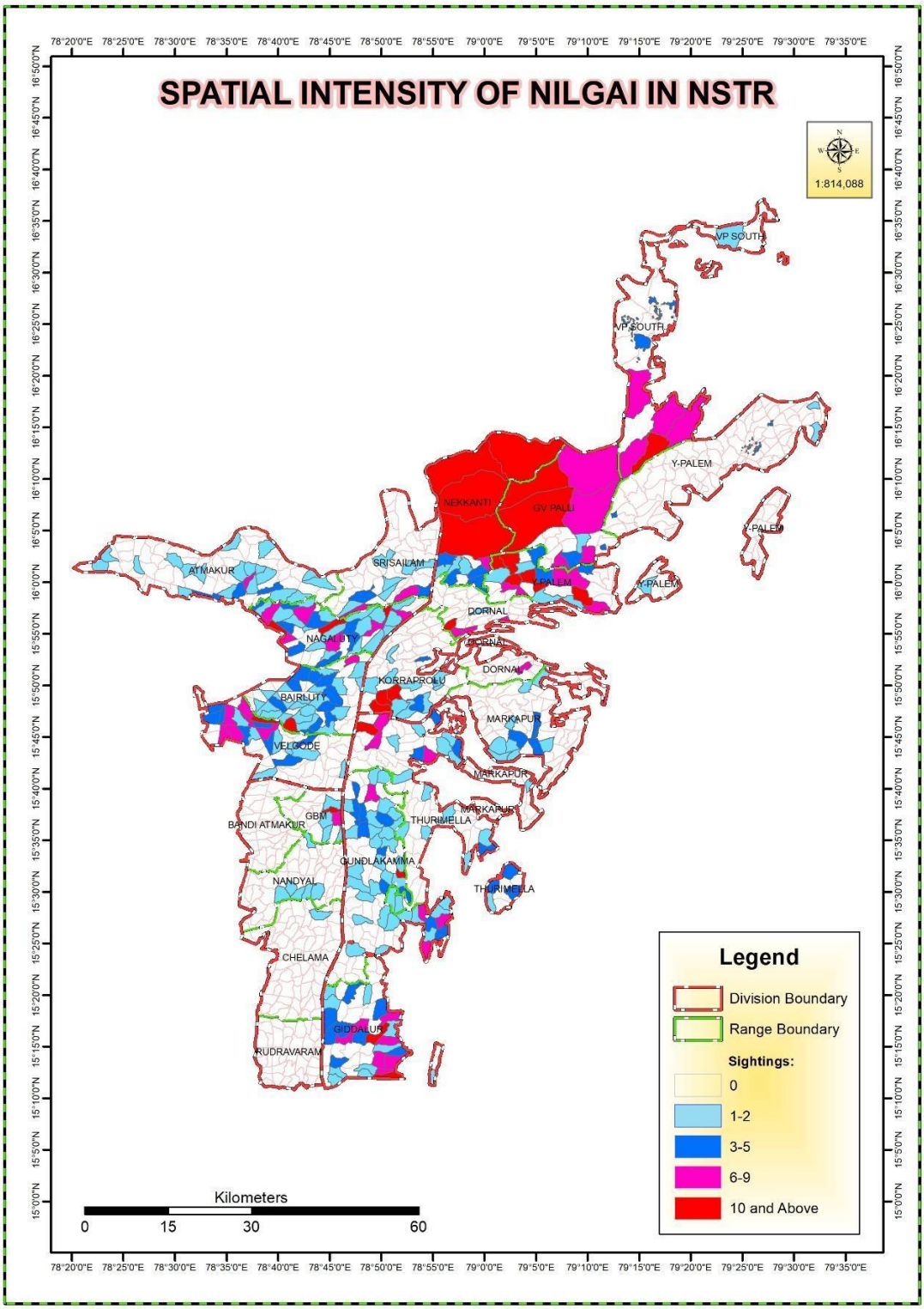
Map-16: Map showing the Spatial Intensity of Sloth Bear in NSTR during 2025



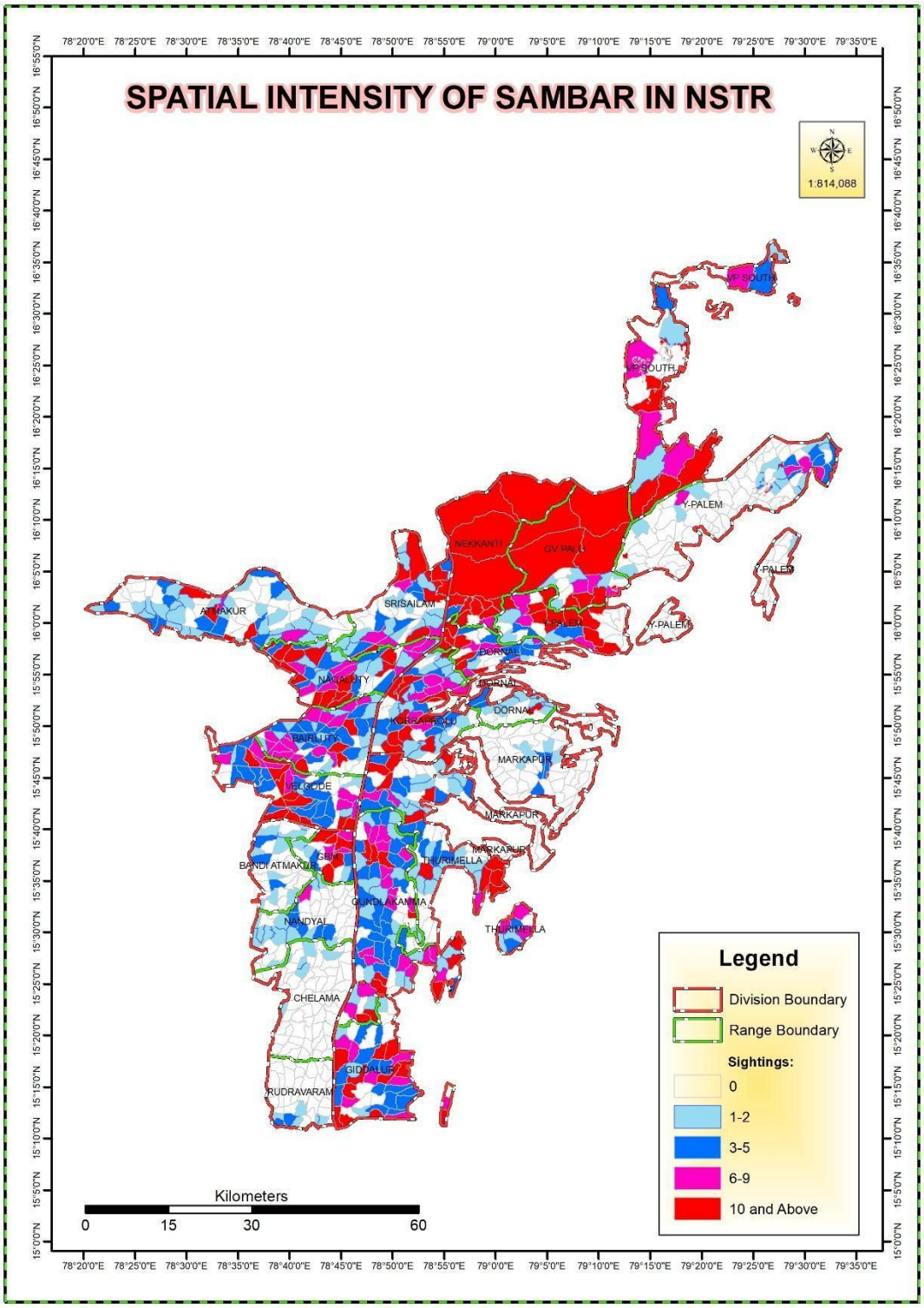
Map-17: Map showing the Spatial Intensity of Wild dog in NSTR during 2025



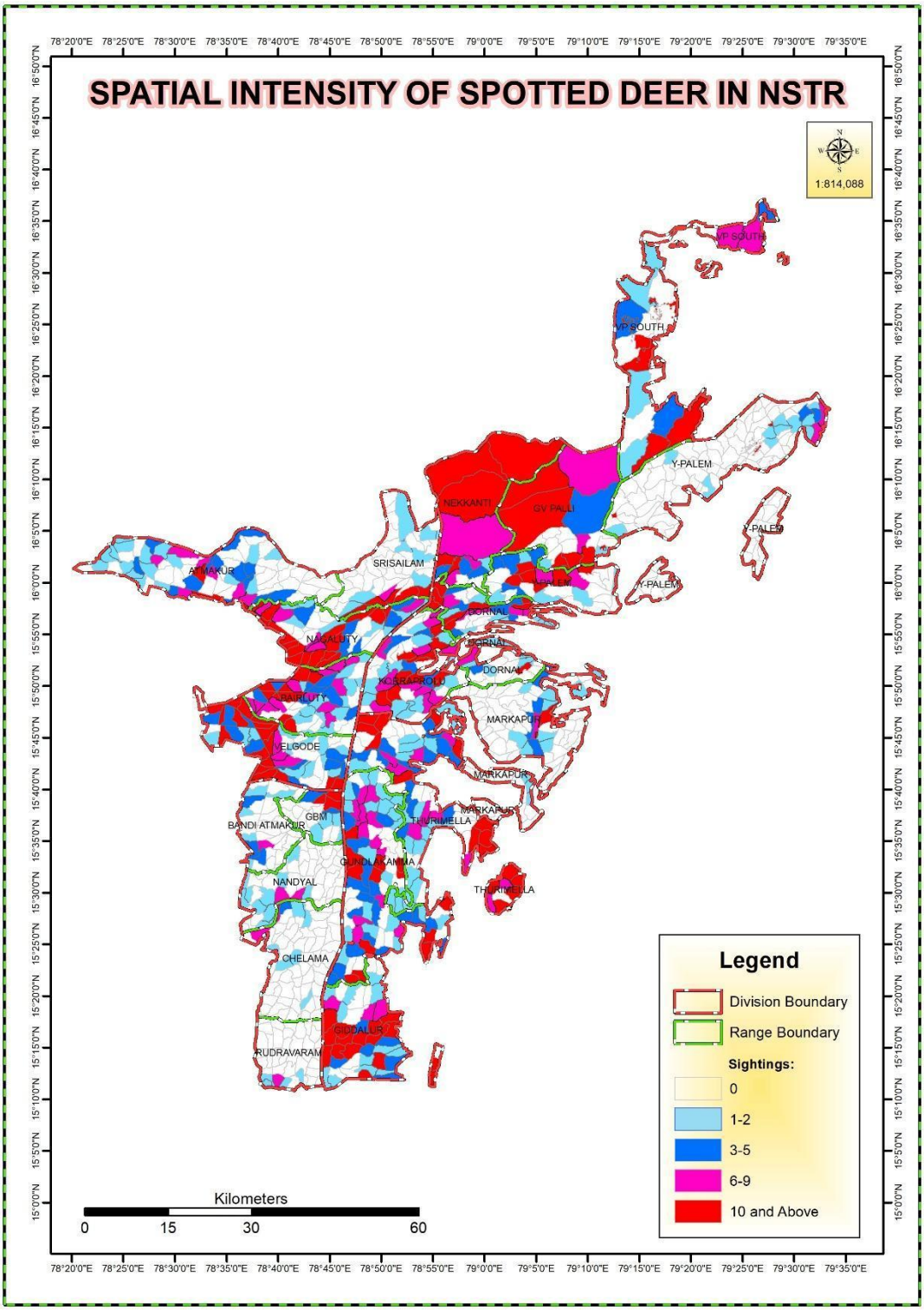
Map-18: Map showing the Spatial Intensity of Nilgai in NSTR during 2025



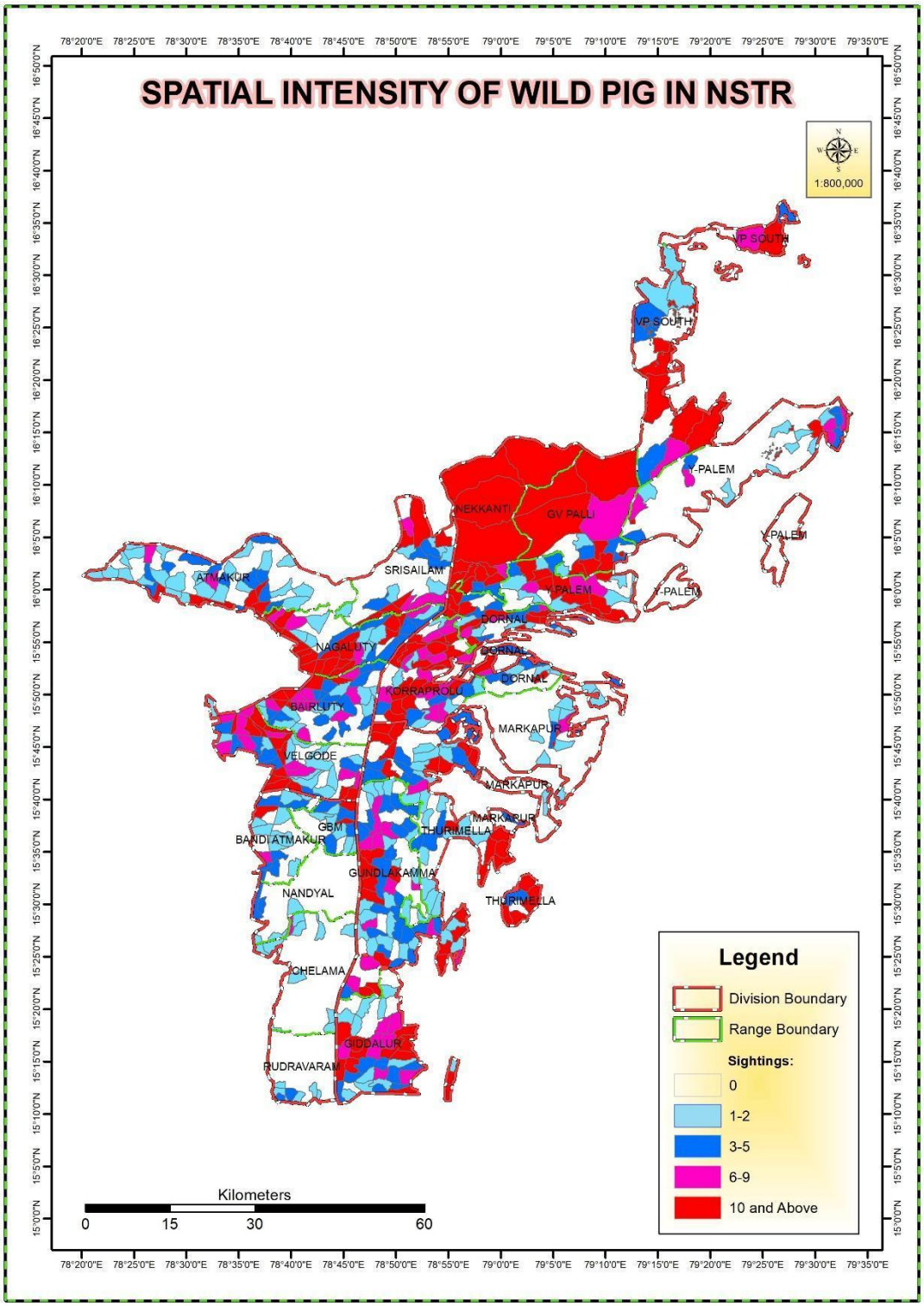
Map-19: Map showing the Spatial Intensity of Sambar in NSTR during 2025



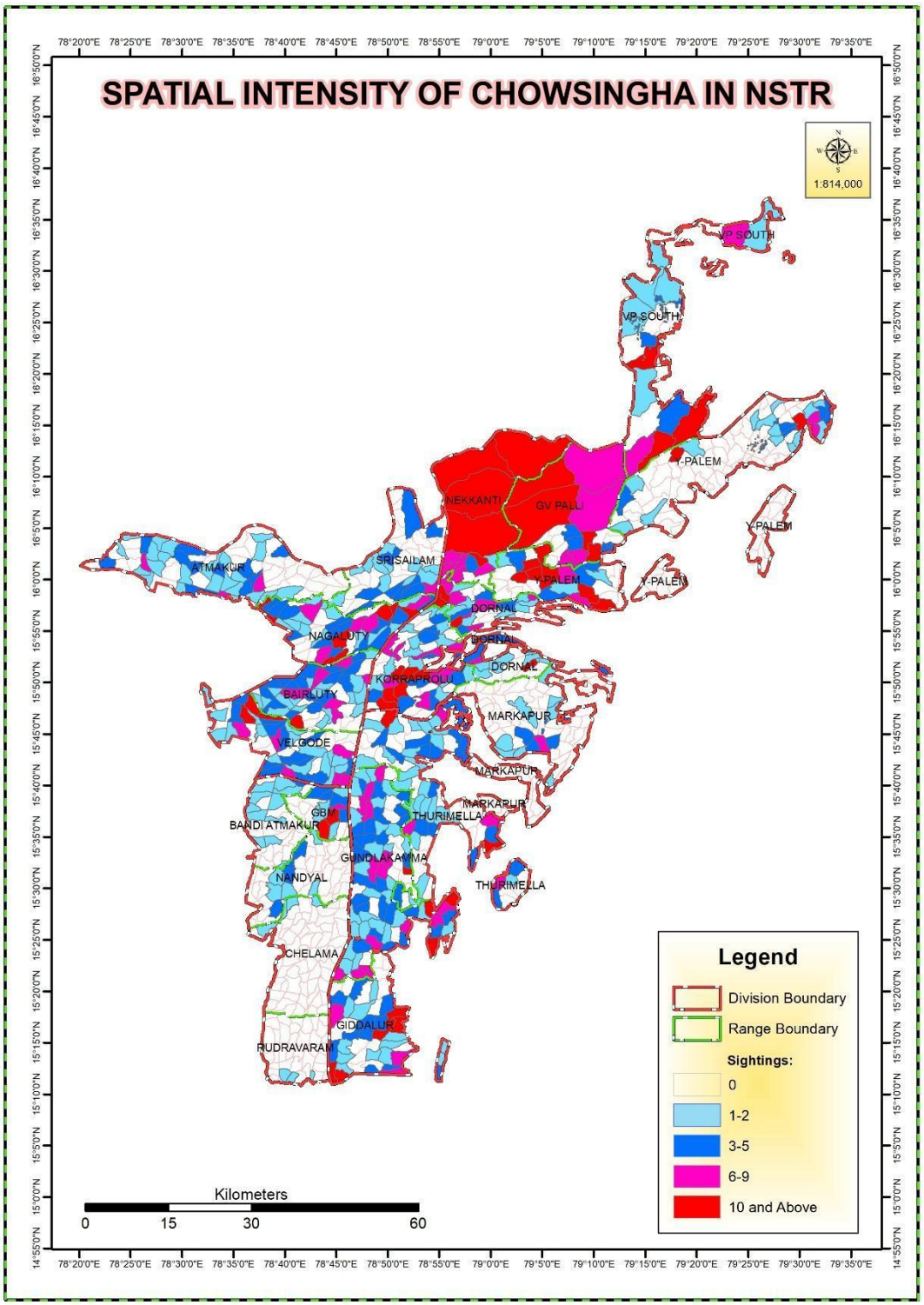
Map-20: Map showing the Spatial Intensity of Spotted deer in NSTR during 2025



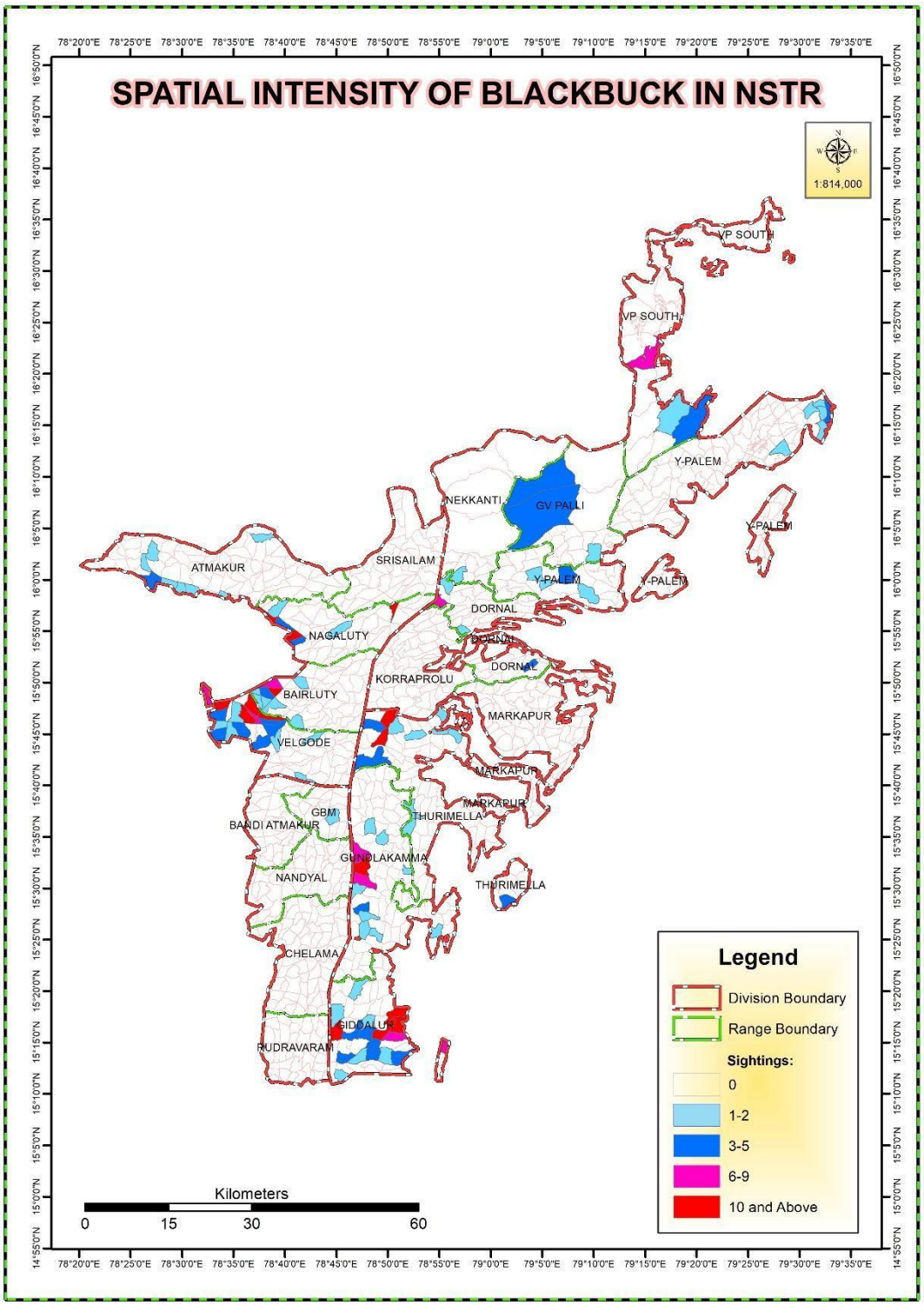
Map-21: Map showing the Spatial Intensity of Wild Pig in NSTR during 2025



Map-22: Map showing the Spatial Intensity of Chow Singha in NSTR during 2025



Map-23: Map showing the Spatial Intensity of Blackbuck in NSTR during 2025



3.4. ASSESMENT OF THREATS

1. Poaching in Tiger Reserve: -

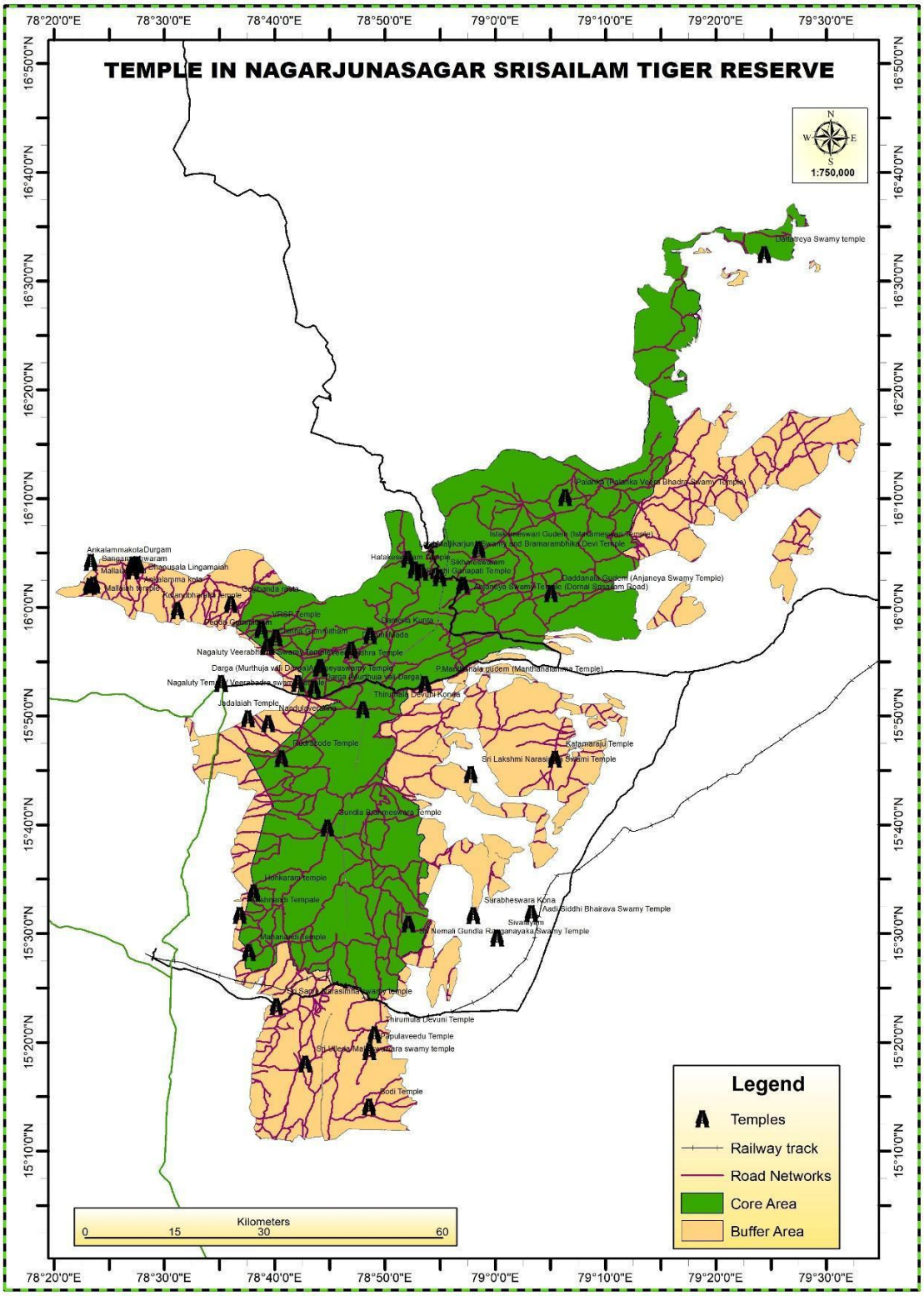
Though poaching is negligible, there is a constant threat. Poaching is predominantly limited to herbivores, and there are no recent incidences of tiger poaching in NSTR. However, very intensive protection measures are being taken, and additional necessary staff have been engaged on an outsourcing basis, in addition to regular staff. All the Deputy Directors/District Forest Officers work under the control of the Field Director in the Tiger Reserve. Details of poaching cases of the last ten (10) years are placed below.

Table 19: - Details of poaching cases of last (10) years

S. No.	Year (2019-23)	Division	Range	Beat	Nature of poaching (Snare / any other weapon pl. specifies)	Poached Animal
1	2	3	4	5	6	7
1	2019-2020	Atmakur	Bairluty	P.A.Puram(N)	-	Spotted Deer
2				P.A.Puram(N)	Knife	Spotted Deer
3				P.A.Puram (N)		Sambar
4			Atmakur	Guvvalakuntla East	-	Spotted Deer
5			Nagaluty	Venkatapuram	Snares-10 Nos.	Sambar
6			Srisailam	Sundipenta	Nets-02 Nos.	Wild Boar
7	2020-2021		Srisailam	Srisailam	-	Leopard
8			Srisailam	Srisailam	-	Monitor Lizard
9			Srisailam	Pecheruvu East	Axe-01 No.	Monitor Lizard
10			Atmakur	Sivapuram	Nets-05 Nos.	Wild boar
11			Atmakur	Guvvalakuntla East	-	Wild boar
12			Nagaluty	Indireswaram West	Knifes- 02 Nos.	Sambar
13	2021-2022		Nagaluty	Nagaluty	Snares-10 Nos.	Wild boar
14			Nagaluty	Nagaluty	-	Wild boar
15			Nagaluty	Venkatapuram	-	Spotted deer
16			Bairluty	Nallakalva	-	Spotted deers-2 Nos.
17			Bairluty	P.A.Puram (N)	Wooden peg	Spotted deer
18			Bairluty	P.A. Puram (S)	-	Sambar
19			Atmakur	Sivapuram	-	Jungle cats
20			APS, Srisailam	Velgode (West)	-	Spotted deer
21	2022-2023		Atmakur	Guvvalakuntla West	-	Spotted deer
22			Velgode	Velgode(North)	Knife-1 No.	Spotted deer
23			APS, Srisailam	-	Knifes-2 Nos.	Wild boar
24			Bairluty	P.A.Puram (North)	-	Sambar
1	2019-20	Nandyal	Nandyal	Thimmapuram	19 Kgs Kanithi meat1 Axe, 2 nos knives	Kanithi

2	2019-20			Prema	20 kgs Kanithi meat	Kanithi
3	2019-20		Chelama	Pacherla	2 Nos Axes, 2 Nos knifes, Poisonous powders	--
4	2019-20			Gajulapalli	25 Kgs Sambar meat ,3 Nos Knives	Sambar
5	2019-20			Kotakonda	6 Kgs Black buck meat	Black buck
6	2020-21		Nandyal	Thimmapuram	(05 Kgs) of Spotted deer meat	Spotted deer
7	2020-21			Thimmapuram	(02) Nos wild boars (Male) carcasses	wild boars
8	2021-22		Chelama	Kotakonda	weighing machine, 1 no kg stone and 1 no. 500gms stone	Black buck
1	2019-20	Markapur	Markapur	Gotlagattu	Fixing of Snares for hunting of Wild animals Seizure of Snares 360 Nos	Wild animals
2	2019-20		Markapur	Gundamcherla	Burnt of Wildlife meat	Spotted Deer
3	2019-20		Dornal	Thummalabailu	Hunting of Spotted Deer seizure of Spotted Deer meat – 16 Kgs	Spotted Deer
4	2019-20		Dornal	Chinnarutla	Death of spotted Deer due to road accident and high speed of the vehicle	
5	2020-21		Markapur	Gundamcherla	Hunting of Spotted Deer	
6	2020-21		Markapur	Kalanuthala	Hunting of Wild Boar seizer of Meat - 10Kgs	Wild Boar
7	2020-21		Dornal	Chinnarutla	Hunting of Monitor Lizard and seizure of meet – 4.5 Kgs	Monitor Lizard
8	2020-21		Y.Palem	Pullalacheruvu	Illegal position of Wild animal Star Tortoise	Wild animal
9	2020-21		V.P.South	Pasuvemula	Transport of Pangolin Scales 1.43 Kgs	Pangolin
10	2020-21		V.P South	Pasuvemula	Transport of Snares for hunting of Wildlife animals 160 Nos	-
11	2021-22		Dornal	Yedavalli	Caught culprits and 2 two-wheeler vehicles along with dead bodies of wild animals i.e Hares- 4 No.s Grey Francolin – 5 Nos	Hares, Grey Francolin

Map-24: Showing the Temples in NSTR



The traditional pilgrimages to religious sites are evolving into large-scale religious tourism in many protected areas across India. A growing influx of visitors, leading to infrastructural development of these sites within protected areas, has high potential to immensely damage the natural ecological balance. The Nagarjunasagar Srisailam Tiger Reserve has a large number of temples and places of religious interest in the Core as well as Buffer areas. Sri Brahmaramba Mallikarjuna Swamy Temple, one of the 12 Jyothirlingas of the country, is located at Srisailam, which attracts 6–7 lakh pilgrims who visit this temple during the two main festivals, namely Maha Sivarathri and Ugadi, every year. Cleaning the litter left behind by pilgrims is a huge task for the staff, and this threat needs to be addressed.





2. Scarcity of water:

The river Krishna, which is the perennial water source, and apart from it, there is a large network of *Bavis* (Wells) and *Kuntas* (Ponds) distributed throughout NSTR. There are numerous streams that cover a large part of the Tiger Reserve. Most of them ultimately join the river Krishna. There is an acute shortage of water in the Tiger Reserve during the drier months.





3. Invasion by obnoxious weeds like *Cassia tora*, *Lantana camara*, *Eupatorium* sp., *Parthenium* sp.etc.,

A few areas, especially those adjoining villages and areas where cattle graze, have a large number of weeds such as *Lanta camara, Prosopis juliflora*, *Cassia tora* (*Senna tora)*, *Eupatorium sp*., etc. Due to intensive weed removal and maintenance, much of the area is free from weeds and is now dominated by grasses.

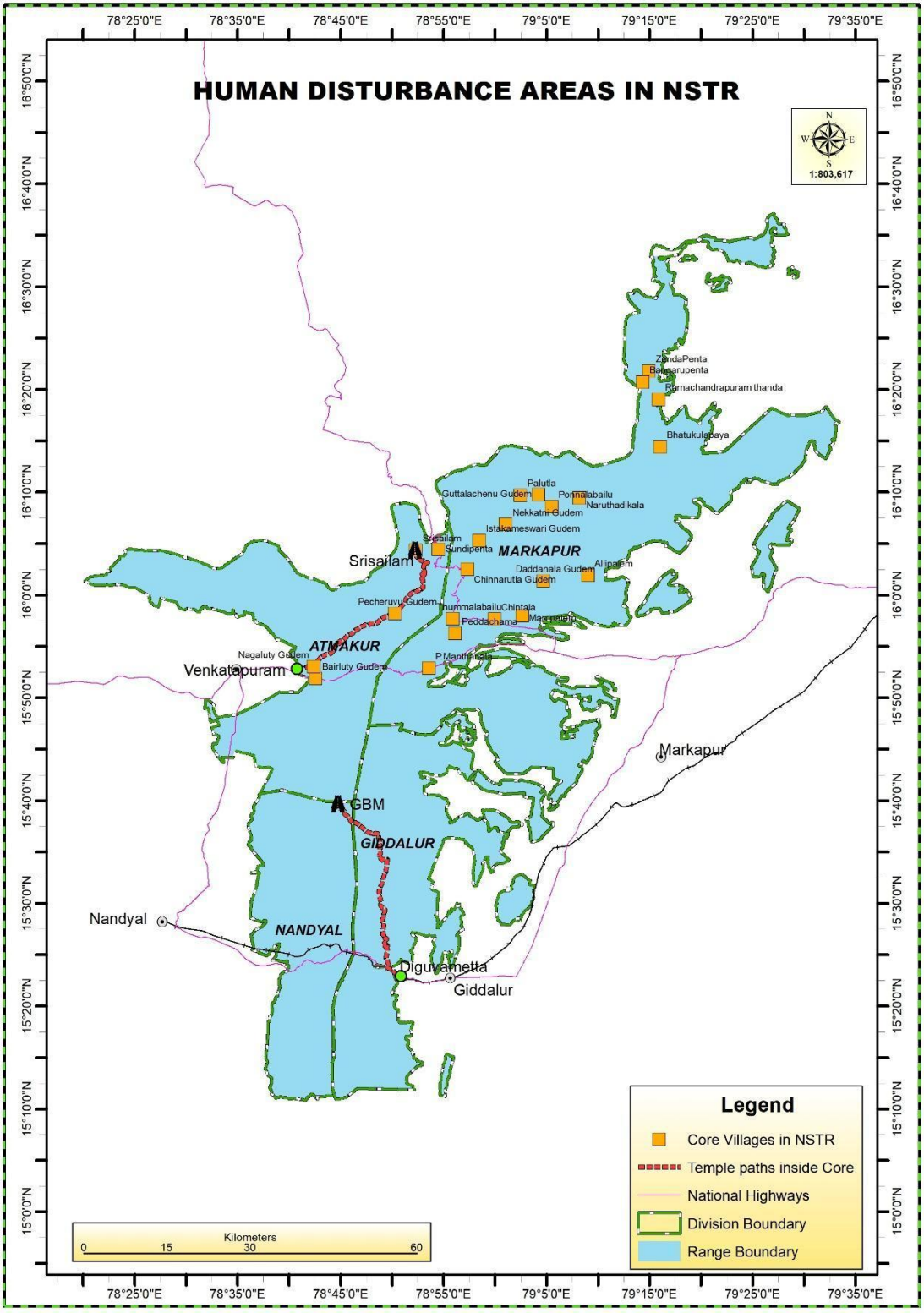
Table 20: Year-wise weed removal

Sl. No	Year	Markapur	Atmakur	Nandyal	Giddalur	Grand Total
1	2018-19	17.05	0	4	15.8	**36.85**
2	2019-20	67	5	4	10	**86**
3	2020-21	59.2	40	0	0	**99.2**
4	2021-22	190.2	70	4	0	**264.2**
5	2022-23	140.5	0	0	0	**140.5**
	Total:	**473.95**	**115**	**12**	**25.8**	**626.75**

4. High Anthropogenic Activity:

Large population of human beings and cattle in the Core zone and number of villages/settlements in the fringe with dependency on the Reserve. In NSTR, 23 villages comprising around 4,500 people are located in the Core area, and they are dependent on the forests for fuel, fodder, NTFP, and grazing.

Map-25: Showing the Human Disturbance Areas in NSTR



5. Migratory Cattle:

Thousands of cattle belonging to the scheduled tribes residing in the core and buffer areas wander in the forests for fodder, resulting in a shortage of fodder for the wild animals. In all base camps, a register for cattle movement is maintained to monitor their movement, and regular immunization programs are planned.

Table 21: - Division wise cattle population

Sl. No	Division	In Core Area					In Buffer Area					Total
		Cow	Goat	Sheep	Buffalo	Others	Cow	Goat	Sheep	Buffalo	Others	
1	PT, Markapur	577	1923	507	407	59	2767	10448	9156	4726	867	**31437**
2	PT, Atmakur	2132	1185	3200	2592	529	4329	1848	4752	2433	90	**23090**
3	PT, Nandyal	3367	3891	13511	11600	62	10485	28324	122769	1787	0	195796
4	PT, Giddalur	0	0	0	0	0	2277	10540	21660	8898	476	43851
	Total:	**6076**	**6999**	**17218**	**14599**	**650**	**19858**	**51160**	**158337**	**17844**	**1433**	**294174**

6. Various National Highways passing through NSTR:

National Highways NH–765, 340C, 565, 544D, 247 passes through the Tiger Reserve and causes a major disturbance. A number of fast-moving vehicles plying on these highways disturb the animals, obstruct their movements and sometimes cause road



kills.

Table 22: - Details of Highways passing through NSTR

Sl. No.	Division	Highway Name	Length of the Highway in Core area (Km)	Length of the Highway in Buffer area (Km)	Total length of the highway (Km)
1	PT, Markapur	**NH-340C** Kurnool to Guntur	34	6	40
2		**NH-765** Hyd to Dornal	26.5	-	26.5
3		**NH-565** Hyd to N.Sagar to Tirupathi	-	21.5	21.5
4		**NH-247** Mandadi to Kothapulla reddy Gudem	1.8	-	1.8
5	PT, Atmakur	NH 340-C	18.86	0	**18.86**
		NH 765	16.00	0	**16.00**
6	PT, Giddalur	NH – 544 D	0	8	8
	Total:		**97.16**	**35.5**	**132.66**

Map -26: Map showing the National High ways in NSTR

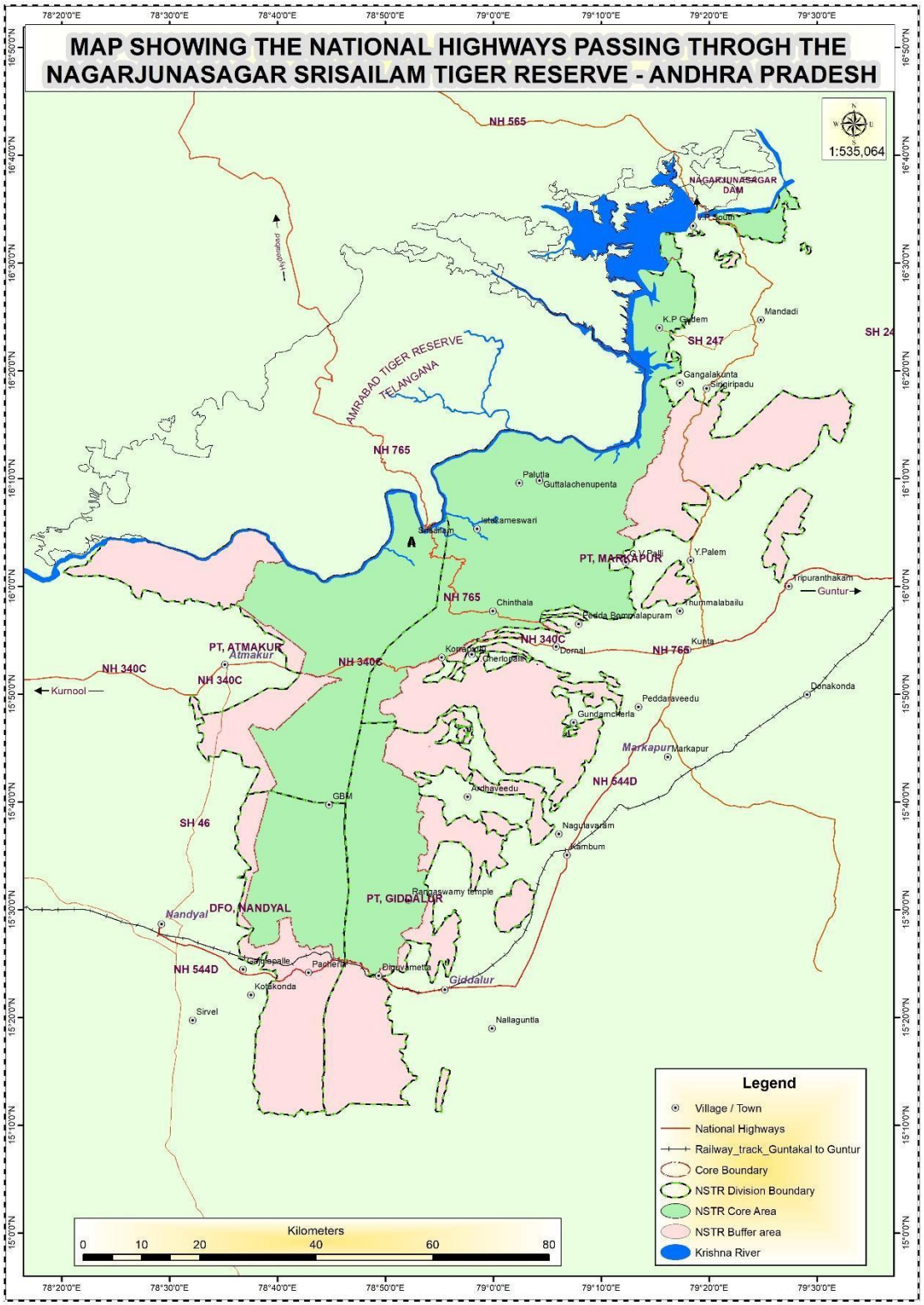


Table 27: - Details of division wise road kills

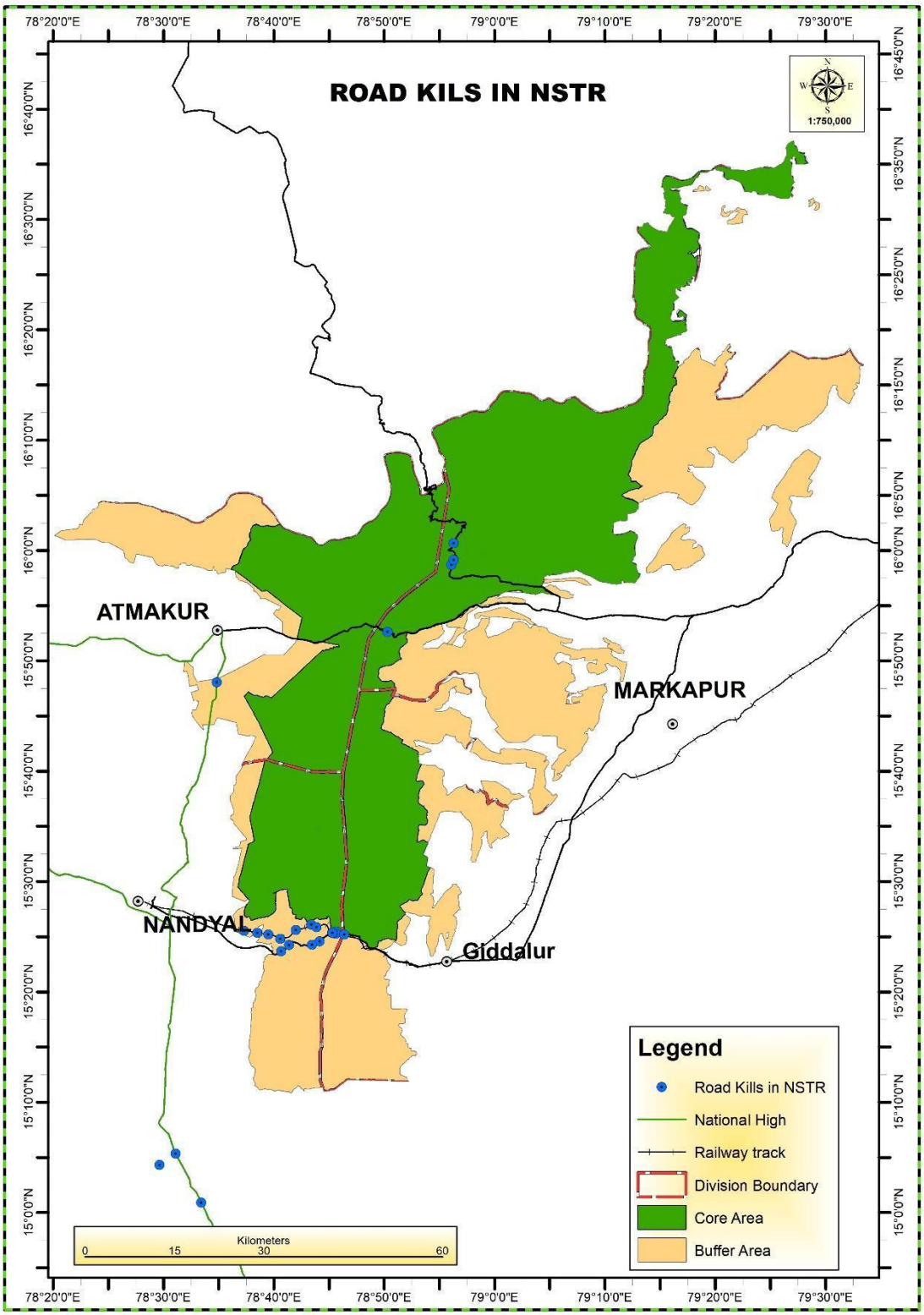


Table:23 Details of Road kills in High ways in Nagarjunasagar Srisailam Tiger Reserve

Sl. No.	Highway Name	Division	Year	Range	Beat	Location of the Road Kill	Animal killed
1	NH-765	PT, Markapur	2018-19	Dornala	Chinnarutla	Eco-Tourism	Spotted Dear
2	NH-340C		2019-20	Dornala	Pedamanthanala	Are chelama	Leopard cub
3		PT, Atmakur	2017-18	Nagaluty	Pangidi (East)	Pothuraju Penta	Spotted deer
4				Velgode	Velgode (North)	Vempenta Fire Line	Wild boar
5				Bairluty	Bairluty	Near Canal bridge	Sambar
6				Srisailam	Sundipenta	Outskirts of Sundipenta	Sambar
7				Velgode	Velgode (West)	TGP Bridge area	Common palm civet cat
8			2018-19	Bairluty	Bairluty	Near SN Thanda	Wild boar
9				Nagaluty	Venkatapuram	Near Pallekatta	Wild boar
10				Bairluty	Bairluty	Ramaiah Kunta	Spotted deer
11				Velgode	Velgode (West)	Jadalaiah bavi area	Spotted deer
12				Velgode	Velgode (North)	Near YSR Smruthi vanam	Spotted deer
13				Velgode	Velgode (North)	Near YSR Smruthi vanam	Spotted deer
14				Srisailam	Sundipenta	Near Mukhadwaram	Spotted deer
15			2019-20	Srisailam	Sundipenta	Hatakeshwaram	Wild boar
16				Srisailam	Srisailam	Rudraksha matam	Wild boar
17				Srisailam	Sundipenta	Hatakeshwaram	Peacock
18			2022-23 (Till12/2022)	Velgode	Velgode (North)	Near YSR Smruthi vanam	Wild boar
19		PT, Giddalur	2021-22	Gundlakamma	Diguvametta South	190 Km Stone Area	Leopard

7. Illegal fishing in the Krishna River within the boundaries of Tiger Reserve.

Around 1,500 families are wholly dependent on fishing in the stretch of the river Krishna that lies within NSTR. Regular meetings of the Forest Department and other line departments with the fishing community are organized. The importance of setting aside certain stretches of the river to allow wild animals to cross and providing alternate livelihood opportunities is being discussed and explored.

CHAPTER-4

History of Past Management and Present practices



4.1 CONSERVATION HISTORY

4.1.1. General History of the Forests:

The core area of the Tiger Reserve is spread over three districts of the state on the southern side of the River Krishna. The Jungle Conservancy Department, under British rule, took over the administration of the forests in 1862. The Forest Act came into existence in 1882, and the reservation of the Nallamala forest under the Act was commenced in 1883. The forest came under the management of the Forest Department in 1886, when the forest settlement commenced.

River Krishna, the main drainage of Nallamala, is the dividing line between the two different cultures with different socio-economic conditions. The north of the River Krishna was once ruled by the Nizam of Hyderabad State, while the British ruled the southern bank. Forest Acts were promulgated to regulate the forest resources from 1883 A.D. and 1900 A.D. onwards in the British-ruled area and in Hyderabad State respectively.

4.1.2. Summary of Past Management:

The historical management of the forests in the Nallamalas is divided into the following periods, each with its own characteristic features of development.

1. **1862-1883**: The management of forests was carried out under a system of issuing licenses. Forest conservancy measures were never adopted, and the licenses were given to fell trees indiscriminately.
2. **1883-1904**: During this period, there was considerable activity in the reservation of forest under the Forest Act. Exploitation of forest produce was under the "License and Voucher System" in the beginning and later under the "Permit System" at a nominal rate. Illicit fellings occurred on a large scale during this period.
3. **1906-1925**: The first conservancy, protective, and development measures were undertaken during this period. The "Permit System" was dispensed with, and systematic fire protection measures were undertaken. This period saw the preparation of the systematic Working Plans by Mr. Wood, Barlowe Poole, Thomson, and Madan. Large-scale plantations were undertaken for the first time, most of which unfortunately ended in failure. Timber fellings were undertaken in the form of improvement fellings under the coppice-with-standard system. Systematic exploitation of fuel and bamboo was done departmentally.
4. **1926-1941**: During this period, the forests were managed under regular Working Plans. Departmental exploitation for forest produce was replaced by contractors' agency.
5. **1942-1962**: During this period, large-scale plantations of teak were given up. Artificial regeneration was proposed in the timber selection and pole series but was a failure. The coppice-with-standards system was replaced with the coppice-with-reserves system.
6. **1962-1978**: During this period, Y.C. Lakshmaiah Naidu's Working Plan was in force and followed a similar system as the above period.
7. **1980-1988**: Lastly, these forests were worked under the Nallamala Industrial Management Plan to supply wood and bamboo to the industries.

4.1.3. The working plans in the above period addressed:

1. Rehabilitation of submerged villages under Nagarjunasagar:

Large chunks of forestlands in parts of Guntur and Nalgonda were de-reserved for rehabilitation and resettlement of submerged villages under the Nagarjunasagar reservoir. Forests were cut for cultivation and human habitation. Much of the forest was cut and converted into charcoal. The collection of dry fuel from the forest on a permit system encouraged large-scale destruction of forests, especially the ***snags***—which are homes of many creatures. The construction of the hydroelectric project at Srisailam warranted the opening of a highway connecting Hyderabad to Srisailam and then to Dornal in the early sixties, which accelerated further degradation of forests. Areas under the ***Reserve Management Plan*** of ***1970*** envisaged the conversion from the selection system to pole woodworking and industrial wood extraction system.

2. Timber Operations including Bamboo and firewood harvest:

Up to 1972, the forest areas were worked under the contract system. Then in 1975, bamboo working was started departmentally to reduce illicit cutting and overworking of bamboo. Later, timber and fuelwood were also worked departmentally. There was a lack of proper supervision during extraction. Silvicultural principles were seldom followed. The simple coppice system with 50 years of rotation could not afford protection to the quality of reserves of standards.

3. Wildlife Management:

(a) Wildlife management was limited to controlling and regulating hunting. Shooting blocks were worked on a cycle of 4 years, with a restriction in the Srisailam temple area of 14,177 acres. Crop protection guns were to be deposited in the nearest police station during the non-crop season. However, this rule was more violated than practiced. The Markapur Reserved Forest was exempted for some time for hunting. This helped revive the animal population, but the shooting blocks were reopened in 1968. The Forest Department improved important salt licks and water holes.

(b) Granting concessions of free grazing to cattle in the state is yet another setback to the development of wildlife and its habitat.

(c) Results of the management of forests in the sanctuary areas have proved that the once luxuriant forest tracts with rich biodiversity were cut indiscriminately. With

the increase in demand for poles, trees from the reserve were smuggled, slowly creating large blank areas.

(d) Slopes were denuded, leading to soil erosion on one side, while obnoxious weeds like Parthenium and Lantana invaded the open patches of the forest on the other.

(e) Cattle (residential and migratory) trampling resulted in the hardening of the forest floor. This accelerated the process of erosion, wiping out prospective regeneration.

(f) In the post-independence era, poaching became a profession. As a result, the wildlife population dwindled rapidly, and many species were pushed to the threshold of extinction due to the loss of habitat. Wildlife protection and conservation aspects were hardly given any importance.

4.2. Conservation and Management after Formation of the Tiger Reserve:

The Nagarjunasagar Srisailam Sanctuary was approved by the GoI in their Letter No. J.11025/18/80/FRY/(PT), dated 16.2.1983, and notified as the "18th Tiger Reserve" in the country. Accordingly, the Government of Andhra Pradesh notified the Tiger Reserve vide their G.O. Ms. No. 66, F&RD Department, dated 25.2.1983.

4.2.1 Sri K. Jagnmohan Rao's first Management Plan (1990 – 1995):

After the declaration of the sanctuary in 1978, the management of the area shifted towards Wildlife Management under the leadership of Sri K. Jagan Mohan Rao, IFS, Conservator of Forests, who wrote the first management plan for the period (1990 to 1995). Detailed prescriptions regarding management have been recommended and the schemes have been implemented based on this. This brought a good change in the habitat and also the population of wild animals increased during this period. Since this sanctuary was under the dual control of wildlife and territorial divisions it suffered to a larger extent as far as the protection and the implementation of the programmes concerned. Therefore, the Government has brought the management under the unitary control of the Field Director since 1-1-1999 onwards. This has brought down some of the major problems like staff transfer etc., to a large extent. This project also suffered due to inadequacy of funds till the A.P. Forestry Project commenced in the year 1995 in the sanctuary. This plan was under operation till 1999 beyond its plan period with revised Annual Plan of Operations. The following are the important aspects of management of Tiger Reserve

1. Zonation and Zone Plans adopted in the first management Plan:

The management plan written by Sri. K. Jaganmohan Rao, I.F.S. has identified the following zones for the purpose of Management of the sanctuary.

Table:24 Areas of Various Zones in First Management Plan

Sl. No.	Zone	Area in Km^2
1	Core Zone	1200
2	Interim zone.	1110
3	Peripheral zone.	1243
4	Visitor zone.	80
5	Aquatic zone.	400
6	Special use zone.	75
7	Buffer zone	525

Core Zone: The existing plan followed a tri-core intra-zonation method within the sanctuary. The primary core (Core-I) has been identified on either side of the River Krishna, enveloping about 1200 sq. km. This includes the waters of the River Krishna. Core-II was suggested to form 2 1/2 × 1 sq. km. around Chandravanka vagu and the downstream that meets the River Krishna at Ethipothala to protect the aquatic habitat for the mugger population. Core-III (mini) was suggested to form on either side of Ramateerdhamsela near the confluence of the Dindi and the River Krishna with an extent of 10 sq. km. to protect the habitat of Chinkaras and Blackbuck. Core-II and III have not been formed on the ground though they have been prescribed in the Management Plan.

Interim Zone: An area of about 1110 sq. km. adjoining the core zone has been identified as the "Interim Zone" for manipulation of the habitat to meet the specific biological needs of the wildlife.

Peripheral zone: About 1243 sq. km. of area left after demarcating the Core and Interim Zones is described as the Peripheral Zone, which is meant for absorbing the biotic impacts from outside.

Visitor zone: This is an overlapping zone over the Interim and Peripheral Zones, covering 80 sq. km. to facilitate nature education and to encourage people to appreciate nature.

Aquatic zone: The Aquatic Zone is created over an extent of 400 sq. km. as an overlapping zone. Dams on the River Krishna at Srisailam and Nagarjunasagar created large water bodies whose backwaters flood into tributaries of the Krishna, like Dindi, Jarrivagu, Nekkanti, Kakuletivagu, Neelaganga vagu, and Nallavagu. In addition, large tanks like Pecheruvu, Gandicheruvu, Rasoolcheruvu, and Lakshmapur attract migrant birds after the monsoon. To give protection to these seasonal birds, special attention is required. Protection is the best form of improvement. The zone is formed to protect the species of mugger crocodile, smooth-coated otter, and soft-shelled turtle. This area will overlap the core and requires strict prohibition on fishing (in the core zone).

Special use zone: Srisailam Temple and Srisailam Hydel Project, Nagarjunasagar Dam site areas are included in the Special Use Zone to facilitate separate treatment for these projects of national importance. The total area under this zone is 75 sq. km.

Buffer zone: The area up to 2 km distance from the Sanctuary boundary is included in the Buffer Zone to an extent of 525 sq. km. to meet the socioeconomic needs of the people living in and adjacent to the sanctuary.

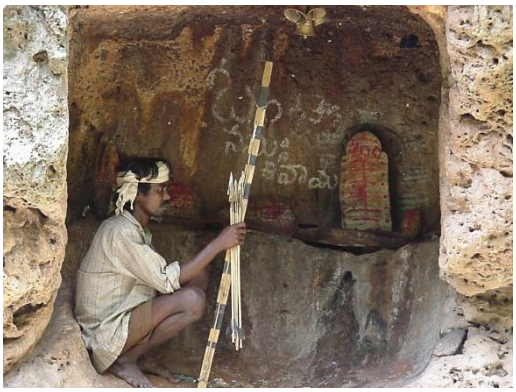
2. Management of Forests:

After the formation of the sanctuary, the total number of timber, fuel, and industrial energy wood coupes was reduced drastically. Entire working was stopped in the Core area of the Tiger Reserve from 1988 onwards. Consequent to the GOI Gazette, Extraordinary, Part II, Section I of 19th December 1988 - Forest (Conservation) Amendment Act 1988, No. 69, and the recommendation of the Central Board of Forestry of May 1988, a decision was taken to ban the clear felling of trees in natural forests. Based on the executive orders issued by the Govt. of India, the Govt. of Andhra Pradesh banned all timber coupes except for supplies to temples and local needs. The Government implemented the orders in true spirit by foregoing huge revenue, since the preservation of the environment is considered a priority of the state. Bamboo working by the department, which was continued till 30.9.97, was also banned from 1.10.97, foregoing huge revenue with the object of protection of wildlife. This Management Plan was in force until a revised new Management Plan was prepared by Sri K. Thulsi Rao for the period 2000-2005.

3. Dire necessity of Eco Development Plan in the area.

In and around the Sanctuary, about 200 villages with a population of about 1.70 lakhs are present. The primitive tribe group – the "Chenchus" – and the Lambada tribes also live in these villages. Besides, about three lakh cattle migrate from plains into this P.A. every year. The people depend on the forests for their food requirements, day-to-day needs, NWFP, fodder for cattle, and land for agriculture. The degree of dependency of these people for their sustenance on Tiger land is substantial, which affects the habitat of the Tiger considerably.

Poverty, coupled with unpredictable crop yield patterns, makes these people depend on P.A. resources such as timber, fuel, fishing, and excessive collection of NWFP, etc., beyond the carrying capacity of the land. As a result, people living close to the P.A. resort to felling trees for commercial purposes to supplement their income. Excessive collection of fuel, fish, and NWFP leads to the deterioration of the habitat. Most of the forest fires caused are purposeful, set by the NWFP collectors. Since two decades, there have been no extremists, forests were intact, smuggling of timber and poaching was rare, and people were living in harmony with the environment.





Due to the circumstances explained above and the denial of resource use by the stakeholders, a substantial gap was created between the people and the Park Management initially, and the extremists made their presence felt by taking up their issues. The people have not digested the facts of conservation, particularly upgrading the status of the Sanctuary to the Tiger Reserve, denial of resource use, and chances of relocation of villages, which aggravated the situation.

Realizing the need for people's involvement in conservation in general, and tiger conservation in particular, the Government of India identified N.S.T.R. as one of the

Eco-development program implementation sites. A detailed participatory Eco-development Action Plan for Nagarjunasagar-Srisailam Tiger Reserve was formulated to stop the pandemonium. This plan is a compendium of micro-planning of all the resource-dependent villages in and around the N.S.T.R. This plan reflected the aspirations of the people. The Eco-development-NSTR truly followed the concept of Eco-development, that is, the "strategy with a site-specific package of measures evolved through people's participation with the objective of balancing socio-economic development of the people and ecological sustenance." The main objective of the strategy was to reduce the thrust on the Protected Area habitat through people's participation on one hand and to improve the degraded ecosystem on the other.

Several training sessions and workshops were conducted. This helped in motivating the staff, NGOs, EDC members, villagers, and other important stakeholders. In total, 1,140 such training workshops were organized involving 689 staff members of all levels, 434 representatives of NGOs, 130 representatives from other governmental departments, 7,580 villagers, and 4,826 EDC members.

As a part of the programme, the local area needs were identified and addressed through a total of 60 income-generating schemes. To reduce the grazing pressure on the habitat, the animal husbandry scheme was implemented, which replaced goats with sheep (586 households benefited). To reduce the fuelwood collection, alternatives such as biogas (534 households) and smokeless chullahs were provided (10,330 households). A total of 169 households benefited through the vegetable vending scheme, 44 through provision shops, and 53 through a basket weaving scheme. Other examples include fish rearing, apiculture, tailoring, canteens, cycle shops, mat making, etc.





Realizing the importance of the role of women in conservation activities, Eco-development-NSTR developed special strategies to ensure their involvement. Special

training programmes for women on conservation, eco-development, thrift, and credit schemes were implemented. As women are often the primary fuelwood collectors, alternatives such as the use of biogas and smokeless chullahs were emphasized at these meetings.

Alternative income generation programmes have substantially brought economic empowerment among women. These programmes have also, in many cases, raised the resource dependents above the poverty line, and the purchasing capacity has also increased. This has now helped the beneficiaries to start savings and create their own assets. Terrorism was mitigated via direct dialogue with the concerned parties. In the past, there were several cases of physical assault on staff resulting in grievous injury and death. As a result of the efforts of the Eco-development team, the previously hostile attitude of these people towards Forest Department activities changed. This was critical in ensuring the support of local people in further implementation of conservation activities.

In addition to the livelihood opportunities and women's empowerment, a total of 115 EDCs have been formed in and around the Nagarjunasagar-Srisailam Tiger Reserve since 1995, covering an area of 10,420 hectares under the habitat improvement scheme. An amount of Rs. 757.4 under the World Bank Aided A.P. Forestry Project was invested to implement the Eco-development Action Plan in all four divisions of the N.S.T.R. Circle. This scheme involved the removal of weed growth, soil and moisture conservation (SMC) works such as the construction of check dams and percolation tanks. Besides these activities, several measures were taken to reduce the biotic pressures on the habitat. Soil and moisture conservation works have substantially improved the groundwater potential, which is not only helping the wild denizens but also the crop fields by raising crop yields. Gully plugging works have helped in checking soil erosion.

4.2.2 Second Management Plan by Sri K. Thulsi Rao 2000-2005.

The Second Management Plan was written with a goal to *"*Conserve natural resources typical of the Nallamalas with a special emphasis on protecting the Tiger with his habitat'. The theme of the plan was: Holistic habitat management, General protection, Fire management, Vegetation and Grassland management, Catchments and Watershed, Management Waterfowl, Management and Wildlife inventories and Census.

The outlay of the plan was Rs. 9544.063 lakhs for the plan period 2000-2005 and beyond plan period (2006-07 to 2008-09) as against the budgetary requirement of Rs 10708.008 lakhs. Plan scheme releases were contributed from various schemes to a tune of Rs 5532.103 Lakhs (Table-12), while the non-plan expenditure was Rs 4011.96 lakhs. Thus, this plan has achieved its goal by implementing the whole project in *toto* within the period. The following schemes were implemented during the plan period and the important works carried out were:

1. **S.R.B.C. Eco-Restoration**: This scheme was to improve the degraded forest areas in command area of Srisailam Right Branch Canal within the Buffer Zone. The scheme was being implemented in Atmakur Wildlife Management Division from 1998-99 to 2002-2003 with the funds deposited by the I&CAD Department.
2. **S.R.B.C. Catchment's Area Treatment**: This scheme was to arrest soil erosion and reduce the run off and prevention of siltation of the catchments in the project area. This also helped in generating suitable employment to the local people. The S.R.B.C. Catchment's Area Treatment Plan was implemented by Atmakur and Achampet Wildlife Management Divisions.
3. **Eco-development (NSTR) Scheme:** This was a 100% centrally sponsored scheme being funded by the Government of India since 1993-94 onwards. The scheme was being implemented in and around the Nagarjunasagar Srisailam Tiger Reserve with a view to reduce the pressure on the forests and to gain confidence and good will of the people living in and around the Sanctuary for better management. Components implemented are Providing Non-Conventional Energy sources like Solar Street Lights, Bio-gas plants etc., Drinking water supply, Medicare to the villages, Check dams for irrigation, Eco-Awareness camps, SMC works and Publicity and Extension.
4. **Augmenting production of Fuel wood and Fodder Regeneration**: Augmenting production of Fuel wood and Fodder Regeneration of degraded forest and promotion of fuel wood saving devices. This was a centrally sponsored scheme. The scheme cost was being shared by both State and Central in the ratio 50:50. The scheme was under implementation since 1998-1999. The main aim of the scheme was to Encouraging people's participation in planting, implementation and management of forests.

5. **Fire Control Methods and Management**: This was a 100% centrally sponsored scheme. The entire scheme was being funded by the Government of India. The scheme was under implementation since 1996-97 and subjective was to minimize and control fire in the protected areas.
6. **Bamboo Project – III (NTFP)**: This was also a 100% centrally sponsored scheme, being implemented from 2000-2001 onwards. The aim of the scheme was to conserve and increase the production of NTFP, including medicinal plants.
7. **NABARD – RIDF Projects** (***NABARD – VI (SMC), NABARD – VII (SMC), RIDF – VIII (JFM), RIDF – VIII (WCM) Phase – II)*:** The RIDF Projects which include VI, VII, VIII and APCFM programmes have been sanctioned to this Circle for implementation from 2000-01 to 2005-06. The works proposed under this scheme are mainly SMC works. The aim of the scheme was to conserve each and every drop of rain by creating additional percolation capacity in degraded forest areas besides taking up vegetative measure by seed sowing and planting seedlings. Under this scheme, 11 projects had been sanctioned for implementation in the divisions during the year 2003-04 as a part of Neeru – Meeru programme with view to harvest the rainwater improvement of degraded forests by providing employment to the user groups in the villages.
8. **Rehabilitation of Indian Star Tortoise** ***(Geochelone elegans):*** Operation Khachua has been taken up using GIS based scientific protocol of monitoring of rehabilitated Star tortoises in the wild. A total of 480 Indian Star Tortoises were released in this tiger reserve. About 320 Tortoises were released in Puli-Cheruvu locality on 28.01.2004 and on 13.12.2005. About 160 tortoises released in Naramamidi Cheruvu on 16.12.2004. Prior to release, all individuals were physically marked by marginal scale clippings. One third of the star tortoises that were released implanted with passive transponder chips (Trovan Model - ID 100). The transponder chips were implanted at the base of the hind limbs using a Trovan passive transponder injector. Post release monitoring has been taken up for study of long-term adaptation and protection measures. The scheme is being implemented in Biodiversity Division from *2003-04* and completed upto *2005-06* onwards with the funds deposited by the CZA, New Delhi.

9. **Neeru – Meeru Programme**: In order to overcome the increased severe water problem faced by the State year by year, water harvesting structures like, Continuous Contour Trenches, Check Dams, Percolation Tanks and Rock Fill Dams etc., have been taken up in a large scale since 15.5.2000 onwards by pooling up the funds sanctioned for SMC works under different plan schemes. The method adopted for taking up the above Water Harvesting Structures is ridge to valley concept. The Neeru – Meeru programme has been taken up in all the (4) Divisions of this Circle in all (8) Phases the water storage capacities created in each Division phase wise till end of Phase – VII and Phase VIII. The ground water level in this Circle has been increased in forest areas sub-soil moisture has also been increased, it has resulted for growing more grass along the streams vallies etc., which has invited the herbivores. Similarly, by taking up a greater number of waters harvesting structures in the fringe forests the water table in the open wells as well as bore wells which are adjacent to forests has increased. The SMC works taken up in the forests not only cater to the needs of habitat improvement in this protected area and surrounded areas, but also provided the employment in a large scale to the people who deprived of their lively hood living in and around the sanctuary, it has also stopped the migration of people to urban to hake their lively hood.
10. **Food for Work Programme**: Apart from the above activities, the Food for Work Programme was implemented in this Circle as per the Government Orders for the benefit of laborers engaged on developmental works. So far 2835.735 metric tonnes of rice have been distributed among the targeted groups and created 429250-man days.

4.2.2.1 Administrative Setup

The area of Project Tiger was 3568.09 sq. kms. The Nagarjunasagar Srisailam Wildlife Sanctuary was later renamed as "Rajiv Gandhi Wildlife Sanctuary" on 21-5-1992, and it was also notified and published in the A.P. State Gazette vide Part – I, No. 41 at Page No. 1296, dated 8-10-1992. In the reorganization of the Forest Department, the Atmakur Territorial Division from Kurnool Circle, Markapur Territorial Division from Guntur Circle (except Ongole Range), and Achampet Territorial Division from Hyderabad Circle were tagged on to this Special Circle, which has jurisdiction over the above three Territorial Divisions. Orders were issued in G.O.Ms. No. 188, E.F.S. and T (For. III) Department, dated 04-12-1998, to this Circle with two functional Divisions,

i.e., Flying Squad Party, Srisailam, and Assistant Conservator of Forests (Bio-Diversity), Srisailam, from 1-1-1997.

Apart from the above, one Division was newly created, i.e., Nagarjunasagar, from the areas of Nalgonda Territorial Division of Hyderabad Circle. In addition, the areas falling within the wildlife jurisdiction of Macherla Range of Guntur Division of Guntur Circle were also tagged on to the Nagarjunasagar Division, which is under the control of the Conservator of Forests and Field Director, Project Tiger Circle, Srisailam.

Thus, the Circle was managed with four Territorial Divisions and two Functional Divisions. Further, the earlier Offices of Assistant Directors, Project Tiger, at Atmakur and Achampet Divisions were wound up and merged with the respective Territorial Divisions.

4.2.2.2 Communication

Road network:

This Core of Tiger Reserve is connected to all the District headquarters and the capital of Andhra Pradesh with well-laid blacktopped (B.T.) road network. Road connecting Hyderabad to Guntur-Kurnool Road runs through the middle of the Sanctuary connecting Srisailam - Dornal. Entire periphery of the sanctuary is also covered with the B.T. roads. There are good Network of previously laid extraction paths (for coupes before declaration as Sanctuary) existing connecting all interior Forests. All these need to be maintained for the movement of the staff to check illegal activities if any. The map of Network of roads is shown Map 26.

Wireless network:

The Core of Tiger Reserve is well connected with a Network of Wireless with ground stations and mobile stations. It is also connected with all the District and State Headquarters through H.F. communication station. Adequate numbers of handsets are given to the Executive staff for effective communication.

4.2.2.3 Research, Monitoring And Training:

The Research activities on wildlife and biodiversity have been being carried out by the Biodiversity Research Centre, Sundipenta and other Wildlife Divisions in NSTR. Check lists of fauna, specifically mammals, birds, reptiles, amphibians, fishes, butterflies, moths, coleopteran, odonates and numerous other forms of insects.

Research inventories discovered 10 Herpatofauna, 18 mantids, 12 arachnids as ***new reports to Andhra Pradesh***. Three ***new species*** of Arachnids discovered in this tiger reserve. Some are very rare and important species of arachnids like Emperor Scorpion, Tarantula spider, Whip scorpion and Whip spider are found in this reserve. Three new species of arachnids are Whip scorpion (*Phrynichus andhraensis* sp. nov.), Tarantula spider (*Poecilotheria nallamalaiensis* sp. nov.) and Tommy spider (*Tmarus srisailamensis* sp. nov.).

The monitoring of tigers have improved with analysis of pugmarks, digitization of pugmarks, opening of tiger monitoring registers at beat level and monitored the tigers at Range and Division level during the period by analyzing the pugmarks of last (5) years regularly.

4.2.2.4. Wildlife Education: -

During this period developed several Wildlife Educational Packages, posters, brochures, and training material and is now widely used in various platforms by the professional wildlifers, Conservation Partners, Forest staff, Researchers in Andhra Pradesh. The prominent works are filming of Eco development works, upliftment of chenchus by involving in the management of Tiger Reserve, concept of mobile paryavaran exhibition van, designing of Brochures, Wall Posters, News Letters etc., on environmental issues viz., on Chenchus as Tiger trackers, Flora & Fauna of NSTR, discovery of new species of flora and fauna, medicinal wealth of NSTR, research activities of Bio Lab and preparation of functionary Manual for D.F.Os and F.R.Os working in Wildlife Wing in the country.

4.2.2.5. History of Management in extended Core of NSTR (Gundlabrahmeswaram Wildlife Sanctuary):

The general history of forests and summary of past management is the same till the year 1988 and is similar to Nallamalai Landscape, i.e., Nagarjunasagar Srisailam Tiger Reserve. Gundlabrahmeswaram WL Sanctuary was declared under Section 26-A of the Wildlife (Protection) Act, 1972, vide G.O. Ms. No. 84, Environment Forests Science & Technology (For.III), dated 27th June 1998. The existing reserve forests, which were notified earlier under the following Acts, form the present sanctuary: Madras Forest Act, 1882 AD – Reserve Forests of parts of Kurnool, Prakasam of erstwhile Madras Presidency; A.P. Forest Act, 1967.

Rights & Concessions: Chenchu, the native tribes of Nallamalai, have been conferred a number of rights and concessions as per C.C.F.'s Lr No. 321, Press Dt. 15/7/1932. They could occupy and cultivate forest land free, in addition to grazing their cattle (including goats) free. They could collect specified non-wood forest produce not only for their bona fide purpose but also for sale. A pernicious practice in the area is girdling of *Sterculia urens* for excessive tapping of gum. As a result, this species has almost become extinct. Another tragedy is *Mahuva* (*Madhuca indica*) flower and tendu leaf collection during summer months, which causes threats from wild forest fires.

The status of Gundlabrhmeswaram Wildlife Sanctuary and various activities, threats, and managerial issues, along with a series of happenings, are listed below.

Timber operations including Bamboo and Fire wood harvest:

Up to 1972, the forest areas were worked under the contract system. Then, in 1975, bamboo working was started departmentally to reduce illicit cutting and overworking of bamboo. Then timber and fuelwood were also worked departmentally, except bamboo extraction for paper pulp by SPM Ltd. After the formation of the sanctuary, the total number of timber, fuel, and industrial energy wood coupes was reduced drastically. The entire working was stopped from 1988 onwards, consequent to the Forest (Conservation) Amendment Act, 1988. Bamboo working by the department, which was continued till 30.9.1997, was also banned from 1.10.1997 onwards.

Beedi leaf:

Extraction of beedi leaf, popularly known as Tendu leaf (*Diospyros melanoxylon*), is being done departmentally. Though burning is not an item of work, for getting a new flush of leaves, burning is practiced. The beedi leaf collectors camping on sparse water holes in summer create stress in wild animals for water and also expose them to hunting while they approach water holes. Extraction of beedi leaves was also banned in the sanctuary from 1.10.1997 onwards.

Collection of NWFP:

About 35 varieties of species of NWFP have been identified as economically beneficial to the Tribals of this region. Mahuva seed, Mohwa corollas, Chironji seed, Karanj seed, Bamboo seed, Rita, Amla, Tendu fruit, Tamarind, Feronia (Velaga), Bauhinia leaves, Honey, and Broom grass are the major important Non-Wood Forest Produce

available in this sanctuary. The major N.W.F.P. from this sanctuary is Bauhinia leaf. This is abundantly available in the forests of Bairluty, and people collect these leaves from the sanctuary. The unscientific tapping of gum from the Gum karaya tree (*Sterculia urens*) by Chenchus pushed this species into the endangered floral list.

The collection is handed over to Girijan Cooperative Corporation Limited (GCC Ltd.). They engage outsiders to collect the produce and are inducing the profit element. D.R. Depots are opened in the forest. If N.W.F.P. collection is made an exclusive right of local tribals, many of the problems would be reduced. There is heavy competition for the collection of NWFPs from the non-Chenchus. As a result, Chenchus are foregoing their earnings. All these items are sources of livelihood for the people. Collection of these products has a major bearing on the relationship of the people with the Park administration as well as park management.

4.2.2.6. Forest protection:

Distrubance from Vehicular traffic:

This sanctuary is situated between two important State Highways known as Kurnool–Guntur Road on the northern boundary and Giddalur–Nandyal Road on the southern boundary. Further, these two roads are interconnected by eastern and western side roads. Thus, the sanctuary is accessible from all four sides to traffic, which causes considerable disturbance to wild animals. Besides this, the Guntur–Guntakal railway track that forms the southern boundary of the sanctuary is also responsible for occasional wild animal accidents.

Hunting by Tribals:

Tribals, especially the Chenchus, are known for hunting wild animals for meat. With the advent of the Wildlife (Protection) Act, 1972, tribals were cautioned against hunting, and wildlife-related laws are enforced against any form of poaching activities. However, sometimes they continue to hunt smaller animals illegally, against which legal actions are initiated. They are known to hunt animals using bow and arrow or stone traps. Rarely, they steal meat from carnivore kills of Sambar, Spotted Deer, or Chowsingha.

Hunting by other people (Poaching):

Organized poaching, mostly by outsiders, existed until the enactment of the Wildlife (Protection) Act, 1972. As noticed from the cases booked, poaching mostly occurred in the periphery of the sanctuary and less in the interiors. People in some of the peripheral

villages were helping the offenders. People from fringe villages of NSTR sometimes indulge in poaching activity. They mostly use snares, country-made weapons, and searchlights. Local people hunt small animals like hares and birds using searchlights with portable batteries, which produce a sound that imitates animals. The electrocution of deer was also not uncommon. Poachers connect live wires to the nearest electrical poles in the fields adjoining the PA on tracks leading to waterholes. Trapping, netting, and noosing methods are also practiced for hunting animals. The water in the rock pools on the stony barren sites on the hillocks is becoming a death trap for animals. The poachers hide in rock compounds built with stones close to the waterhole and wait to kill the animals either with guns or with bows and arrows. Though the Chenchus are well aware of enforcement, they still hunt small animals like squirrels, monitor lizards, and birds like jungle fowl, partridges, babblers, and doves, etc.

Destruction of Forests:

The Chenchus and a few other communities living along the roadsides of the northern boundary sell fuel wood to the trucks that ply on the State Highway. They keep firewood bundles on the roadside for selling. They live all through the year under sun and rain. To protect themselves from wild animals, they make fire close to their sleeping dens. The living conditions of these people need to be improved a lot. The Vaddera community of Siddapuram mainly depends on timber smuggling, though they have good agricultural lands. They blame the large freshwater tank adjoining their village, which seldom gets filled, notwithstanding heavy rains, and brings no water to their fields.

Tartur is a small village in Kurnool district where Lord Sree Rangaswami temple exists. The villagers celebrate an annual fair every year in the month of April. It lasts for 15 days. A variety of goods are sold, and people from adjoining villages and from Karnataka and Maharashtra visit and buy their yearly requirements in this market. In the name of Jatara, people have discovered a way to loot the forest and sell the produce both as raw and manufactured goods. The southern and southeastern parts of GBM Sanctuary are vulnerable during the pre-Jatara period, from December to March every year. Timber is hidden under hay in the backyards until the Jatara starts. A convoy of bullock carts transports the timber day and night during the festival.

Fires:

Fire is another very serious problem caused by people illegally entering the park. As of today, no fire protection measures have been adopted in the park. Villagers cause fires willfully or by negligence. The majority of fires (70–80%) are associated with mahua flower and tendu leaf collection time. Fires cause widespread damage to the flora and fauna, especially the subterranean fauna of the park. Generally, summer fires are ground fires occurring from December to June every year.

Grazing & Wildlife health:

A large number of cattle grazes in the park. A huge number of migratory cattle also graze in the area, which reduces fodder available to wild animals, and in turn, the wild animals come out of the forests, creating human–animal conflict. There are no records of outbreaks of cattle-borne diseases or epidemics in this reserve, even though there is a large influx of cattle from outside.

Tourism:

At present, almost all visitors are religion-oriented. Wildlife tourists are almost negligible. During *Shivratri* every year, about 0.10 lakh pilgrims pass through the sanctuary to visit Gundla Brahmeswaram and Rudracode temples, which are in the heart of the P.A.

Research and Monitoring:

The following activities undertaken under research and monitoring.

- Socio-economic and anthropogenic studies of the people living in and around the P.A. under the sponsorship of UNDP/GoI/GoAP, strengthening of wildlife management and eco-development planning capabilities of Nallamala and compilation of the results of land-use practices of people and their impact on the Gundla Brahmeswaram Sanctuary.
- Ethno-Medico Botanical Studies on Medicinal Plant Wealth of Nallamalas, A.P.
- Study of the Effect of Man-Made Barriers (Roads, Railway Lines & Irrigation Canals) on the Distribution and Migration of Wildlife by the Department of Zoology, Osmania University, Hyderabad.

One research station on Nallamalais ecology was built at Srisailam under the SRBC Eco Restoration Scheme. The facilities offer simultaneous research on floral, faunal,

community, GIS-based studies on biodiversity mapping & analysis, and phytochemical analysis of rare and endangered medicinal plants. The plan of Sri Tulasi Rao was extended to 2009, and a later plan was prepared for the period 2009 to 2020. It was revised for the period 2013–14 to 2022–23 after the bifurcation of Andhra Pradesh, and it was completed in March 2023.

4.2.3. Third Management Plan, Sri Rahul Pandey, IFS 2013-14 to 2022-23:

This Management Plan considered the new provisions of the Wildlife (protection) Act 1972 duly amended in 2006 and with prime objective of long-term ecological security of largest Tiger Landscape of the country. The plan has taken care by reducing the human pressure and to regenerate the forest habitats in fringes. The stringent protection measures implemented during the period enhanced the population of tigers and prey in the landscape. This Tiger Conservation Plan has been developed at landscape level connecting Nallamalas to Seshachalam hills through various steppingstones of conservation sites. This plan has been developed in three parts viz., Core/Critical Tiger Habitat Conservation Plan, Buffer Zone Management Plan & Corridor Plan which will take care of the management of tiger populations at source and outside the Protected Areas.

The following changes have been made during the period and various works executed in the NSTR for the improvement of protection, monitoring the prey & predator of the Reserve, habitat improvement works, infrastructure maintenance & improvement and day to day maintenance of the Reserve in nutshell.

1. **Consolidation of Forest area in Project Tiger Circle**:

   Series of attempts have been made in the declaration of buffer area for Gundlabrahmeswaram and Rajiv Gandhi Wildlife Sanctuaries, and proposals were sent to the Government. Attempts were made to consolidate the core by the Chief Wildlife Warden of the state regarding the Core and Buffer areas. A huge exercise has been done and finally materialised at the end of the plan period, i.e., during July 2023, by consolidating the Core and Buffer areas, and necessary proposals were sent in complete shape to the Government. These proposals were prepared by studying the distribution of prey and predator in the areas of Core and proposed Buffer.

After the re-organisation of the State of Andhra Pradesh, the area of NSTR was not notified. Considering the reorganization of the department in view of the new districts formed in the state of Andhra Pradesh, proposals have been sent to the Government for reconstitution of NSTR by:

i) By including the earlier buffer proposals which were not declared (NSTR buffer, GBM buffer, since its addition as extended core, which are pending with the Government).

ii) By implementing the NTCA guidelines/MEE reports, bringing the entire area of the Tiger Reserve under Unified Command, which was not there since the inception of the Tiger Reserve.

iii) Considering the re-organization of Districts and Forest Department to facilitate the Unified Command.

iv) Notifying the areas by the State of Andhra Pradesh after re-organization, as all the earlier notifications are combined with the State of Telangana.

As per the proposal notification, the Core area of the Tiger Reserve is 2908.36 sq. km, the Buffer area is 2534.47 sq. km, and the total landscape, excluding the adjoining areas, comes to 5442.83 sq. km.

Table 25: Abstract of Administrative structure in NSTR

Sl. No.	Division	Range	Sections	Beats
1	Atmakur	**5**	**17**	**35**
2	Nandyal	**5**	**16**	**59**
3	Markapur	**7**	**15**	**44**
4	Giddalur	**4**	**14**	**32**
	TOTAL:	**21**	**65**	**162**

Map 28: Showing the Administrative Boundaries of NSTR Circle

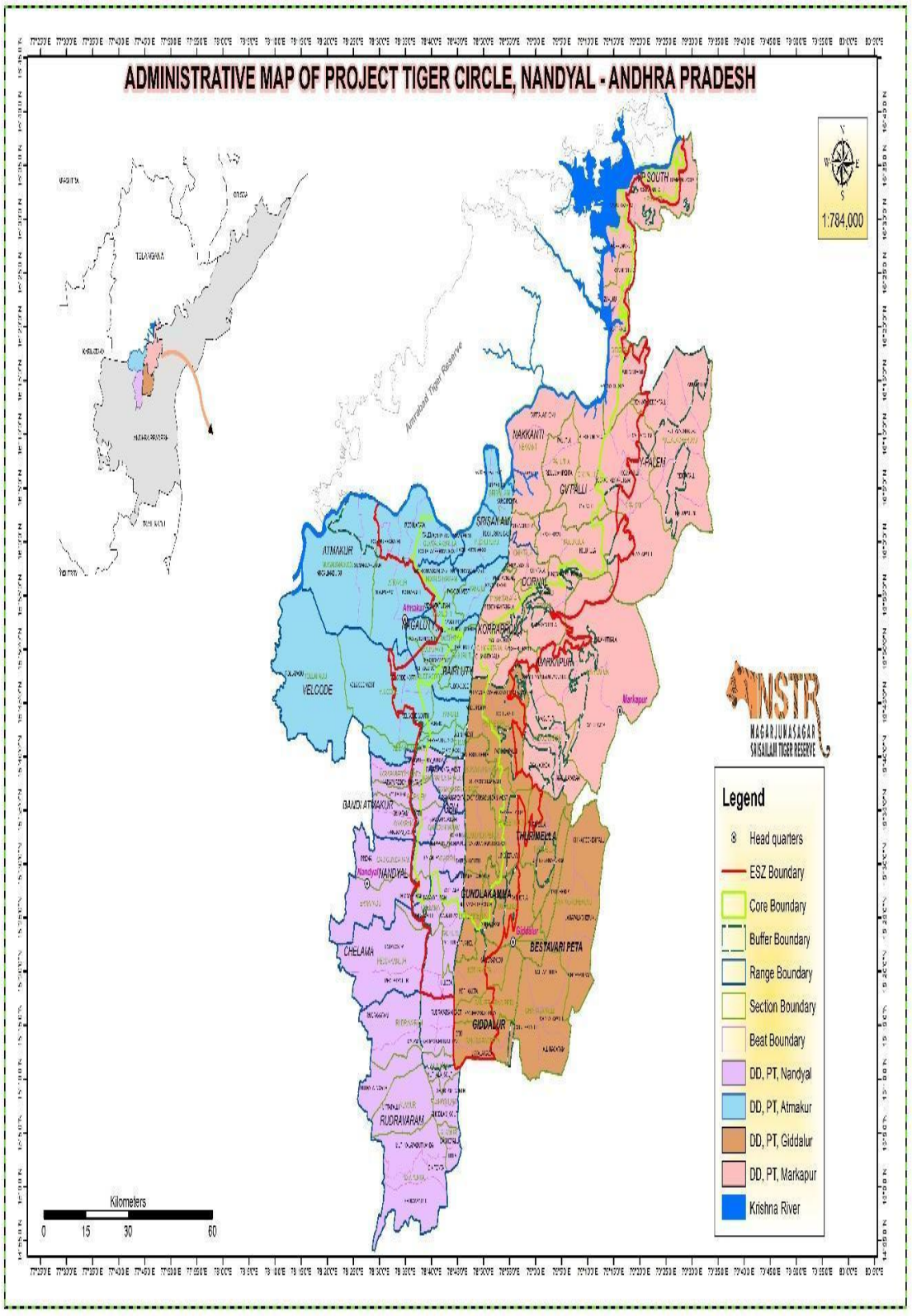


Table 26: Ranges, Sections, Beats of Project Tiger, Atmakur:

Sl. no.	Name of the Range	Name of the Section	Name of the Beat
1	1) Bairluty	1) Bairluty	1) Kurutla Penta
2			2) Bairluty
3		2) Rudracode	1) Rudracode
4			2) Nallakalva
5		3) Pasurutla	1) Pasurutla
6		4) P.A. Puram	1) P.A. Puram South
7			2) P.A. Puram North
8	2) Nagaluty	1) Nagaluty	1) Nagaluty
9			2) Venkatapuram
10		2) Pangidi	1) Pandigi East
11			2) Pangidi West
12		3) Indireswaram	1) Indireswaram East
13			2) Indireswaram West
14	3) Velgode	1) Velgode	1) Velgode South
15			2) Velgode North
16			3) Velgode West
17		2) Pangidi	1) Pangidi
18		3) Abbaraju kunta	1) Abbaraju Kunta
19		4) G.B.M.	1) G.B.M.East
20			2) G.B.M.West
21		5) Rollapadu	1) Rollapadu
22	4) Atmakur	1) Atmakur	1) Sivapuram
23			2) Kolanu Bharathi
24			3) Regulapaya
25			4) Kothapalli
26		2) Musalimadugu	1) Musalimadugu
27			2) Gummadapuram
28		3) Guvvalakuntla	1) Palem
29			2) Kottala Cheruvu (West)
30			3) Kottala Cheruvu (East)
31	5) Srisailam	1) Pecheruvu	1) Pecheruvu East
32			2) Pecheruvu West
33		2) Srisailam	1) Srisailam
34			2) Gudi Parvatham
35			3) Sundipenta
	5	**17**	**35**

Table 27: Ranges, Sections, Beats of Project Tiger, Markapur

Sl. No.	Range Officer	Section	Beat
1	1) Markapur	1) Nagulavaram	1) Donakonda
2			2) Magutur
3			3) Bommilingam
4			4) Nagulavaram
5		2) Markapur	1) Gundamcherla
6			2) Gottipadiya
7			3) Kalanuthala
8	2) Dornal	1) Dornal	1) Yedavalli
9			2) Chilakacherla
10			3) Pedda Bommalapuram
11		2) Chinthala	1) Chinthala
12			2) Thummalabailu
13	3) Korraprolu	1) Pedda Manthanala	1) Y.Cherlopalli
14			2) Pedda Manthanala
15			3) Pedda Chama
16		2) Ch.Manthanala	1) Ch.Manthanala
17			2) Nallaguntla
18	4) G.V Palli	1) G.V Palli	1) G.V Palli
19			2) Burugundala
20		2) Palutla	1) Palutla
21			2) Regumanupenta
22	5) Nekkanti	1) Nekkanti	1) Chinnarutla
23			2) Nekkanti
24		2) Guttalachenu	1) Guttalachenu
25	6) Y.Palem	1) Y.Palem	1) V.B Puram
26			2) Boyalapalli
27			3) Komarolu
28			4) Mallepalem
29		2) Pullalacheruvu	1) Venkata Reddy Palli
30			2) Naidupalem
31			3) Akkapalem
32			4) Rentapalli
33			5) Pullalacheruvu
34		3) Kolukula	1) Kolukula
35			2) T.R Cheruvu
36	7) V.P South	1) Sirigiripadu	1) Sirigiripadu
37			2) Gangalakunta
38			3) Gottipalla
39			4) Kandlakunta
40			5) Zavaku
41		2) V.P South	1) Koppunuru
42			2) Nagulavaram
43			3) Pasuvemula
44			4) Tumrukota
	7	**15**	**44**

Map:29 Showing the Administrative Boundaries of Markapur Division of NSTR

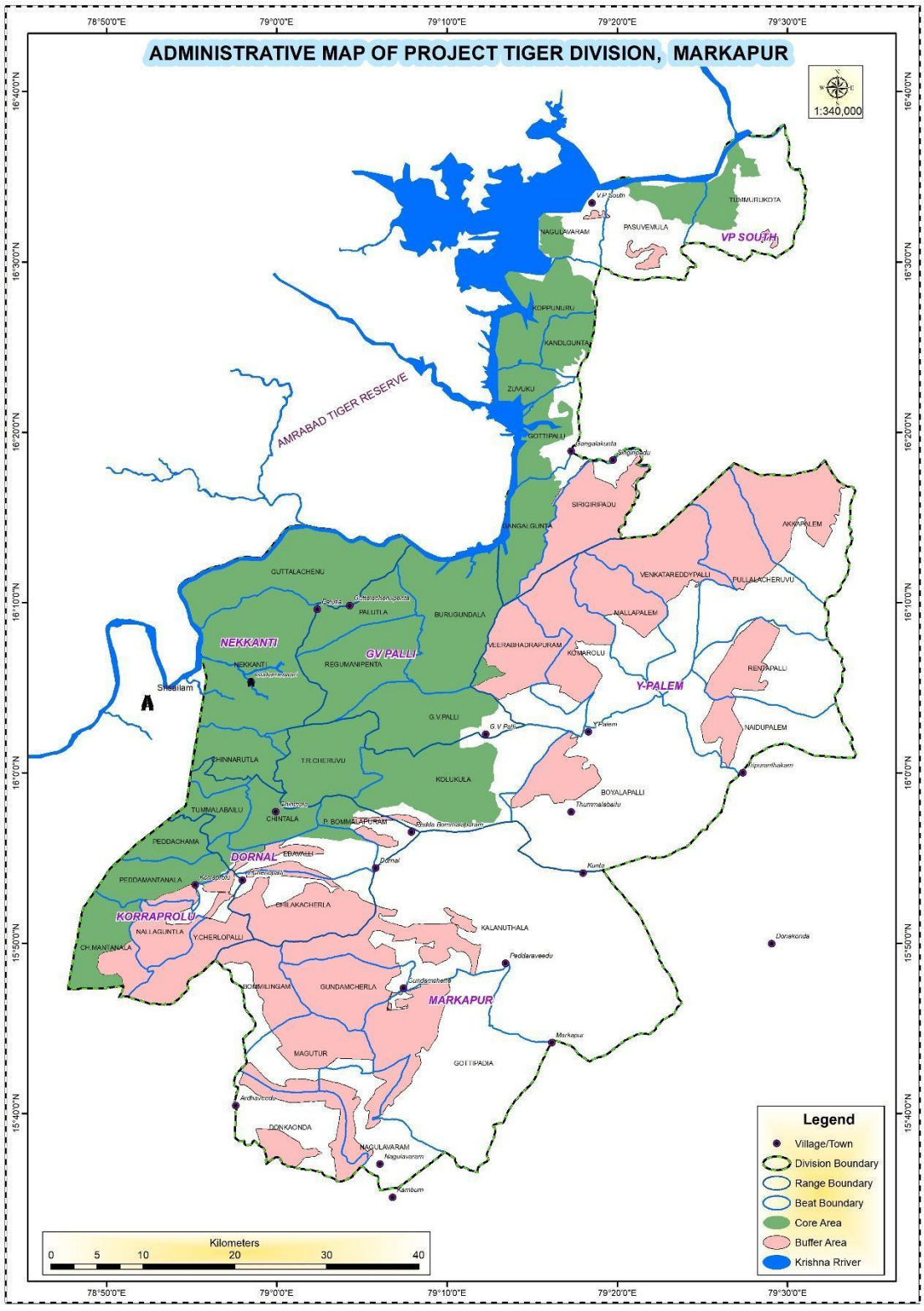


Table 28: Ranges, Sections, Beats of Project Tiger, Giddalur

Sl. No	Range	Section	Beat
1	1) Giddalur	Sanjeeva Rao Peta	1) Uyyalwada
2			2) Bodi
3			3) Sanjeeva Rao Peta
4		Kothakota	1) Kothakota
5			2) Sandrapodu
6	2) Gundlakamma	Diguvametta	1) Tunnel
7			2) Diguvametta North
8			3) Diguvametta South
9		Malakondapenta	1) Mlakondapenta West
10			2) Mlakondapenta East
11		Isukagundam	1) Isukagundam West
12			2) Isukagundam East
13			3) Obulesunipenta
14		Racherla	1) Racherla
15			2) Ambavaram
16	3) Turimella	Turimella	1) JBK Puram
17			2) Turimella
18		Araveetikota	1) J.Pullalacheruvu
19			2) Araveetikota
20		Velagalapaya	1) Bollupalli
21			2) Velagalapaya West
22			3) Velagalapaya East
23		Papinenipalli	1) Maddipenta
24			2) Papinenipalli
	3	**10**	**24**

Map 30: Showing the Administrative Boundaries of Giddalur Division of NSTR

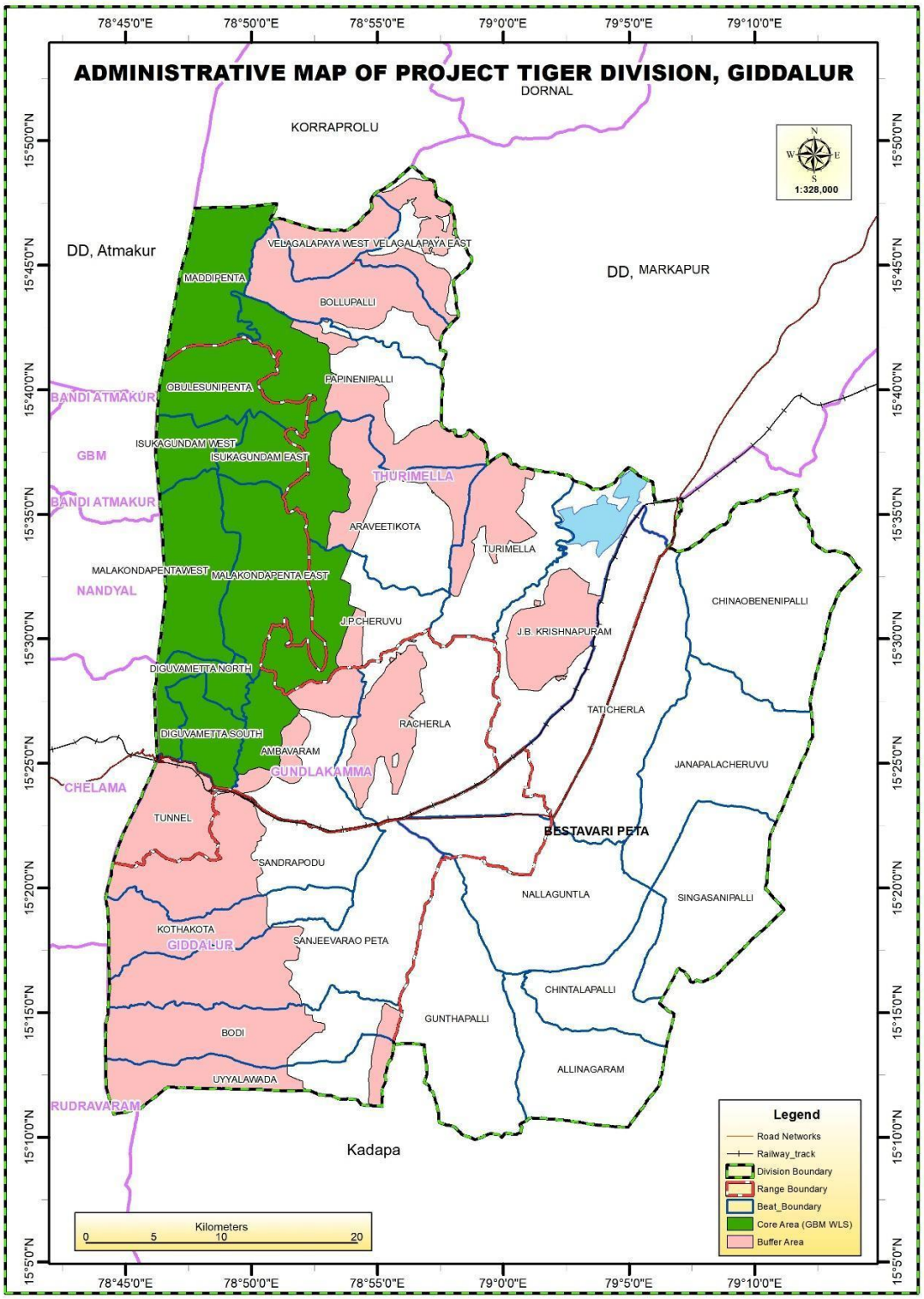
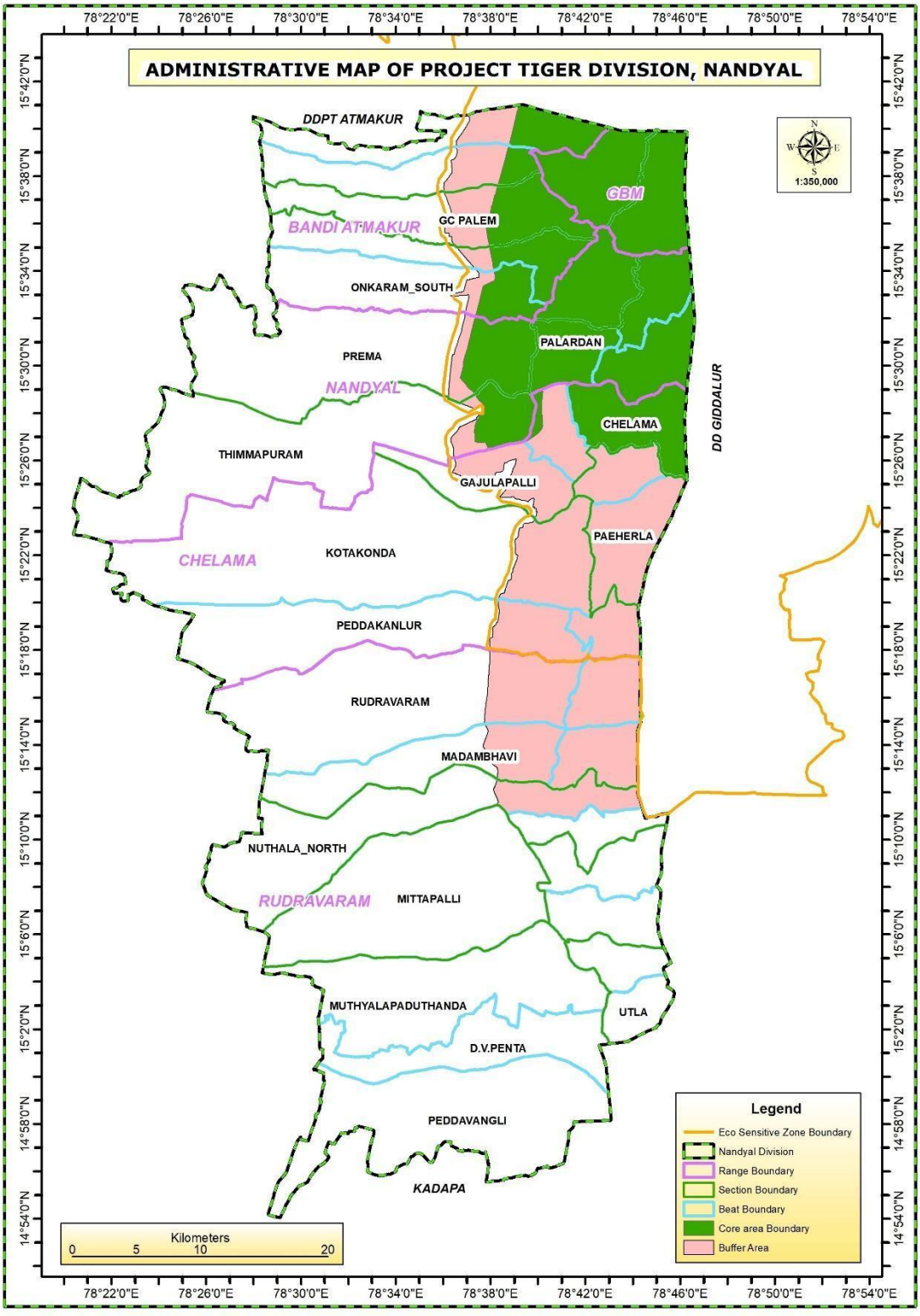


Table 29: Ranges, Sections, Beats of Project Tiger, Nandyal

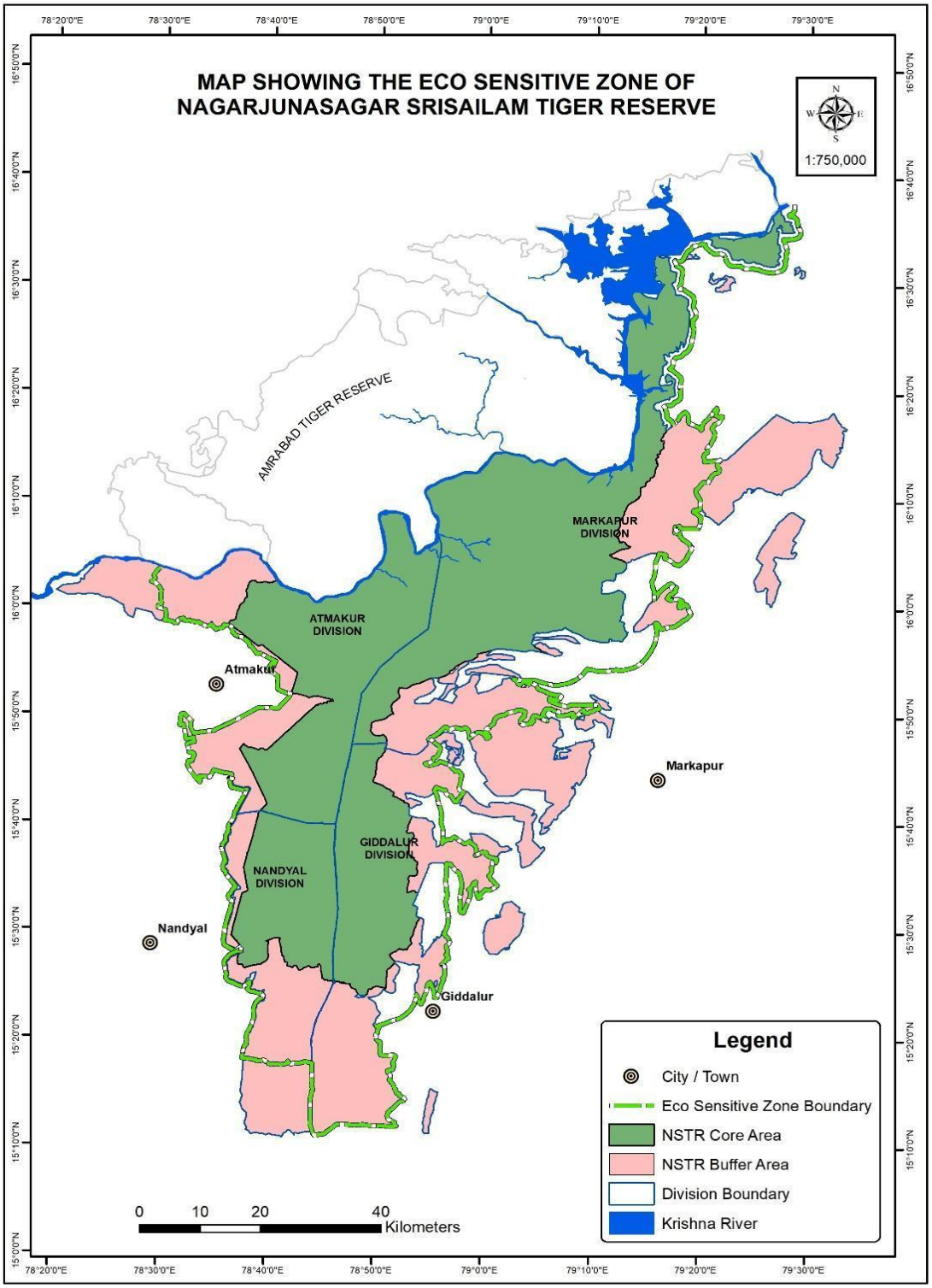
Sl. No	Range	Section	Beat
1	1) G.B.M.	1) R.Penta East	1) R.Penta East
2		2) R.Penta West	2) R.Penta West
3	2) Nandyal	1) Baireni	1) Baireni
4			2) Baireni South
5			3) Palardam
6		2) Gadigundam	1) Gadigundam
7			2) Prema
8		3) Ernapadu	1) Thimmapuram
9	3) Bandi Atmakur	1) Honkaram	1) Honkaram North
10			2) Honkaram South
11		2) G.C.Palem	1) G.C.Palem
12		3) N.R.Kunta	1) N.R.Kunta North
13			2) N.R.Kunta South
14	4) Chelama	1) Chelama	1) Chelama
15			2) Basavapuram
16			3) Gajulapalli
17		2) Pacherla	1) Pacherla
18			2) Dongabavi
19		3) Peddakambalur	1) Kotakonda
20			2) Peddakambalur
21			3) Ulleda
22	5) Rudravaram	1) Rudravaram	1) Rudravaram
23			2) Rudravaram East
24			3) Medambavi
25			4) Medambavi East
26		2) Nuthala	1) Nuthala North
27			2) Nuthala South
28		3) Ahobilam	1) Ahobilam North
29			2) Ahobilam Sourth
30		4) Alamur	1) Bachepalli
31			2) Utla
32			3) Mittapalli
33		5) D.V.Penta	1) Muthyalapadu Thanda
34			2) D.V.Penta
35			3) Peddavangali
	5	**16**	**35**

Map:31 Showing the Administrative Boundaries of Nandyal Division of NSTR



2. **Declaration of Eco Sensitive Zone of NSTR**: As per the Government of Andhra Pradesh instructions, a series of meetings were conducted with the concerned District Collectors and heads of line departments. Keeping in view the safety and security of wildlife in its natural environment, as well as livelihood opportunities for tribals and others, and developmental activities outside the Core area of the NSTR, the Government sent the proposal for the declaration of an Eco-Sensitive Zone. The objective of the proposal is to minimize the pressure on the Core area and to provide additional protection to the wildlife all around the Tiger Reserve. Wherever there are no Reserved Forests adjoining the Tiger Reserve, revenue lands have been proposed as Eco-Sensitive Zones. On the declaration of this area, there will be additional protection for wildlife and its habitat. The livelihood activities of the villagers, especially farmers whose lands fall in the Eco-Sensitive Zone, will not be affected, as there are no restrictions on ongoing agricultural practices and traditional livelihood activities in the revenue lands outside the forest area. The Government of India, Ministry of Environment, Forests & Climate Change, New Delhi, has issued the final notification of the Eco-Sensitive Zone of Nagarjunasagar Srisailam Tiger Reserve vide Notification No. 4022, dated 18.10.2021, covering a geographical area of 2,149.68 sq. km. (Annexure – II).

Map:32 Showing the Eco Sensitive Zone of NSTR



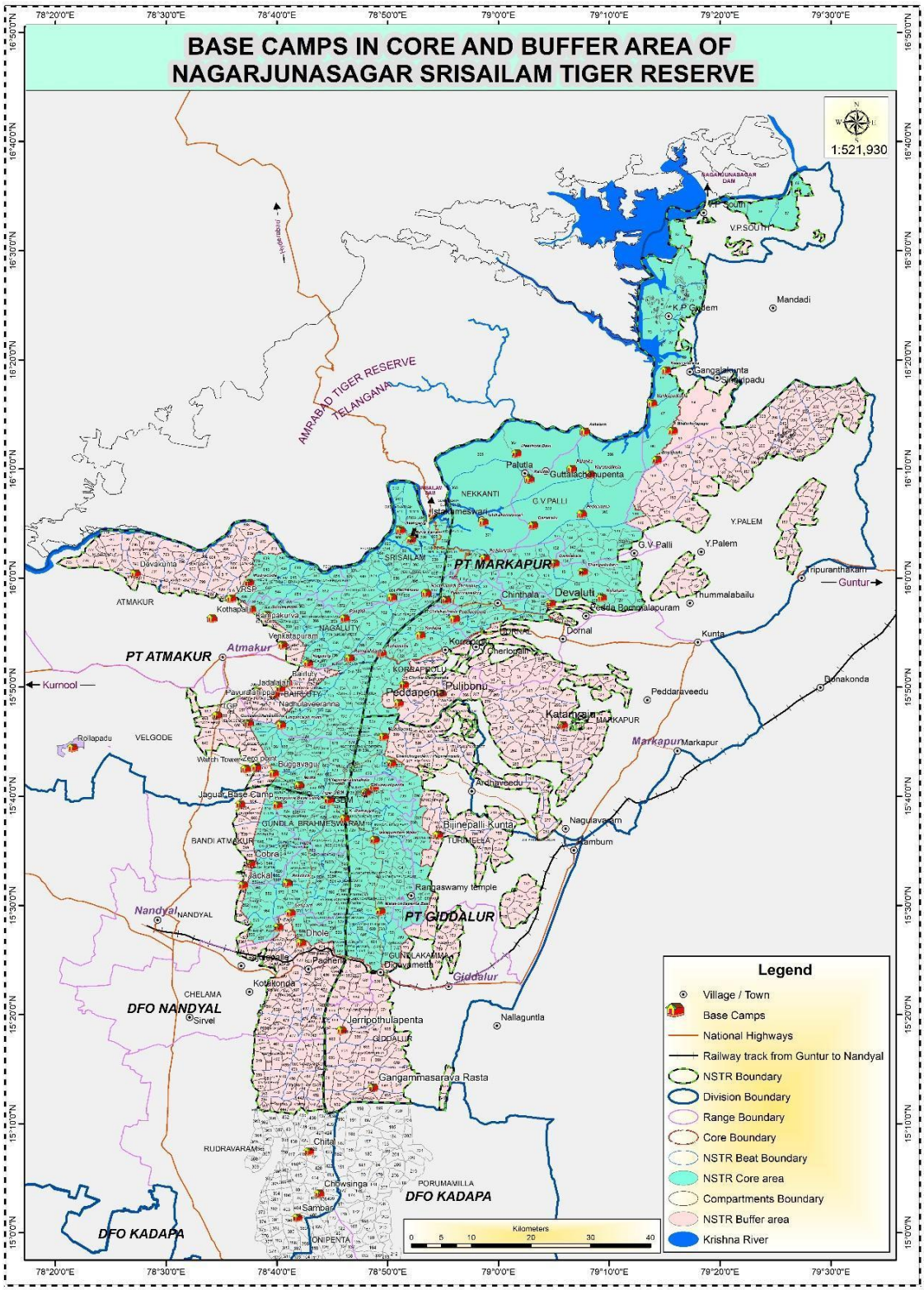
3. **Relocation of Villages**: There are 23 villages within the core area of NSTR. Attempts and a series of meetings were conducted for the relocation of villages. During this period, there have been no relocations or rehabilitation of villages from the core area, which need to be pursued in the coming plan period.
4. **Demarcation of boundaries:** Demarcation of boundaries was given top priority; 2,531 boundary pillars were constructed during the period. The division-wise split-up is as follows.

Table: 30 Division-wise Boundary Pillars

Sl.No	Name of Division	No of Boundary Pillars constructed.
1	Atmakur	**487**
2	Markapur	**1093**
3	Nandyal	**77**
4	Giddalur	**874**
	Total	**2531**

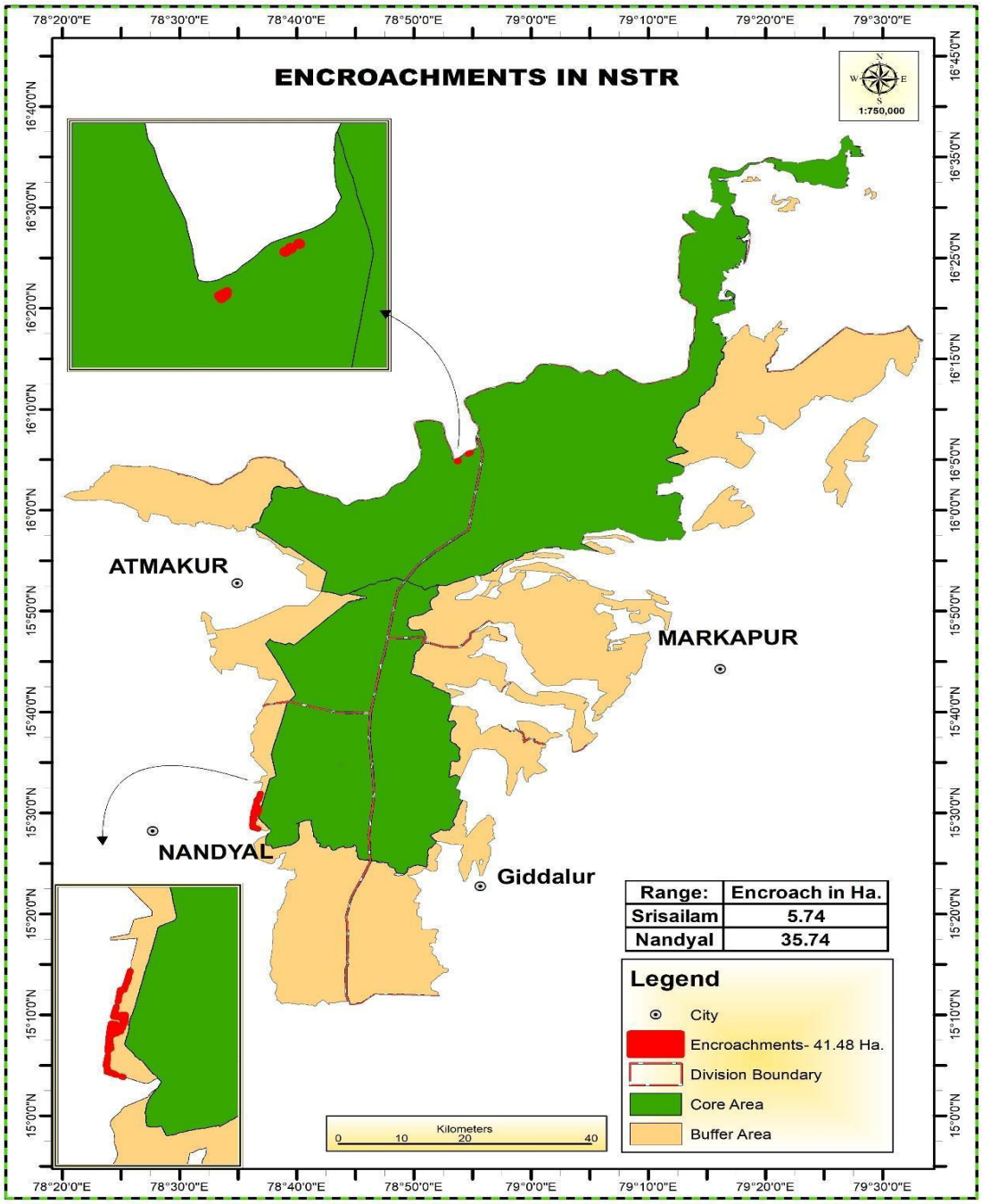
5. **Base camps**: To strengthen the protection of NSTR and to enable close monitoring of prey and predators, 55 additional base camps were added to the existing base camps of the NSTR. The added base camps include 16 in Atmakur Division, 17 in Markapur Division, 13 in Project Tiger, Nandyal, and 9 in Giddalur Division.

Map:33 Showing the Base Camps in Core & Buffer Area of NSTR



6. **Encroachment:** There are no encroachment cases or attempts of encroachment in Giddalur and Markapur Divisions. 41.48 Ha area encroached upon in Project Tiger, Nandyal for which cases have been booked and prosecution is in progress.

Map:34 Showing the Encroachments in NSTR Circle



7. **Fire protection**: The NSTR is a highly fire-prone area and is mostly burnt during the summer for various reasons. Collection of MFP and mahua fruit is one of the reasons. To control fire incidence and facilitate monitoring, 13 Fire Watch Towers have been constructed in NSTR, distributed as follows: Atmakur (4), Markapur (7), and Giddalur (2). The details of recorded fire incidents are presented here.

Map:35 Showing the Fire Watch Towers of NSTR

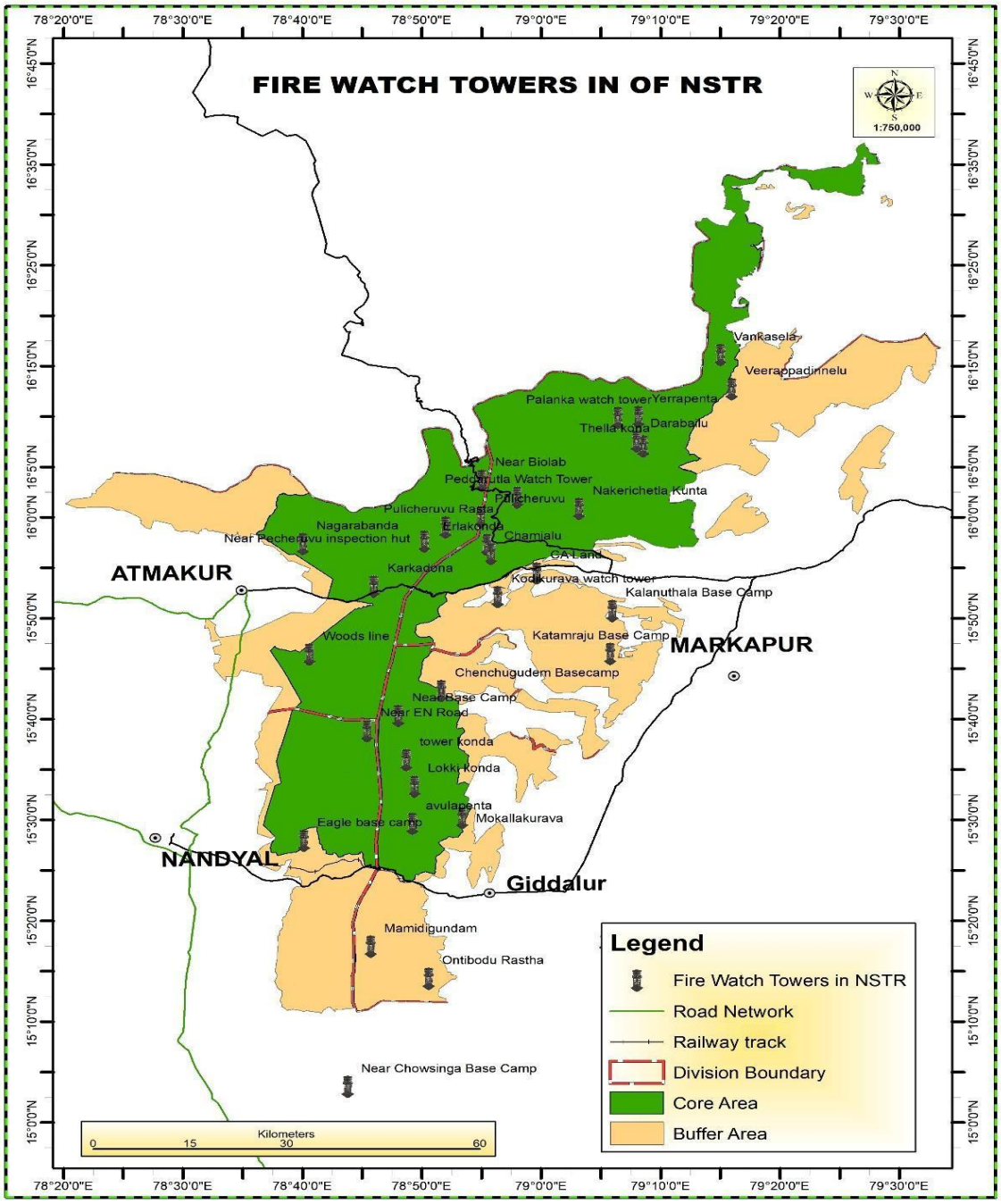
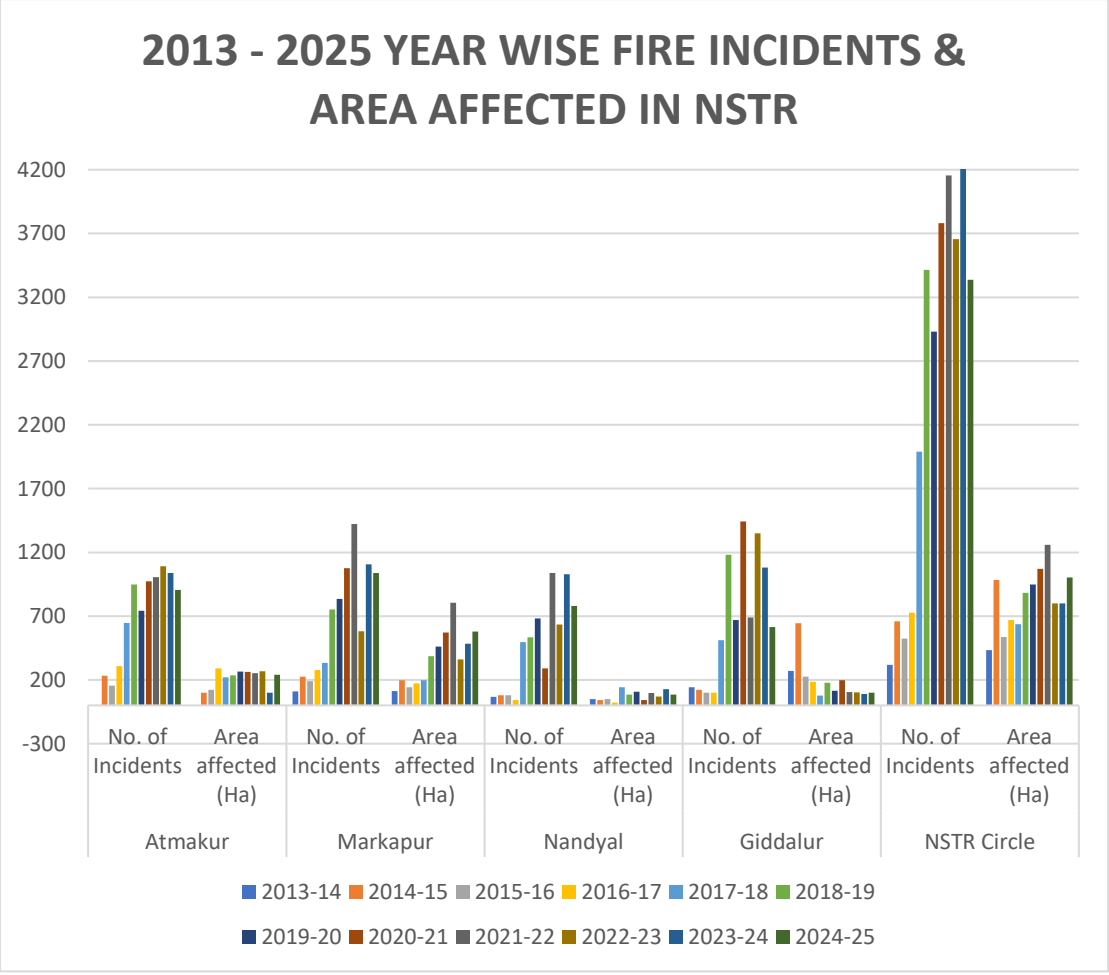


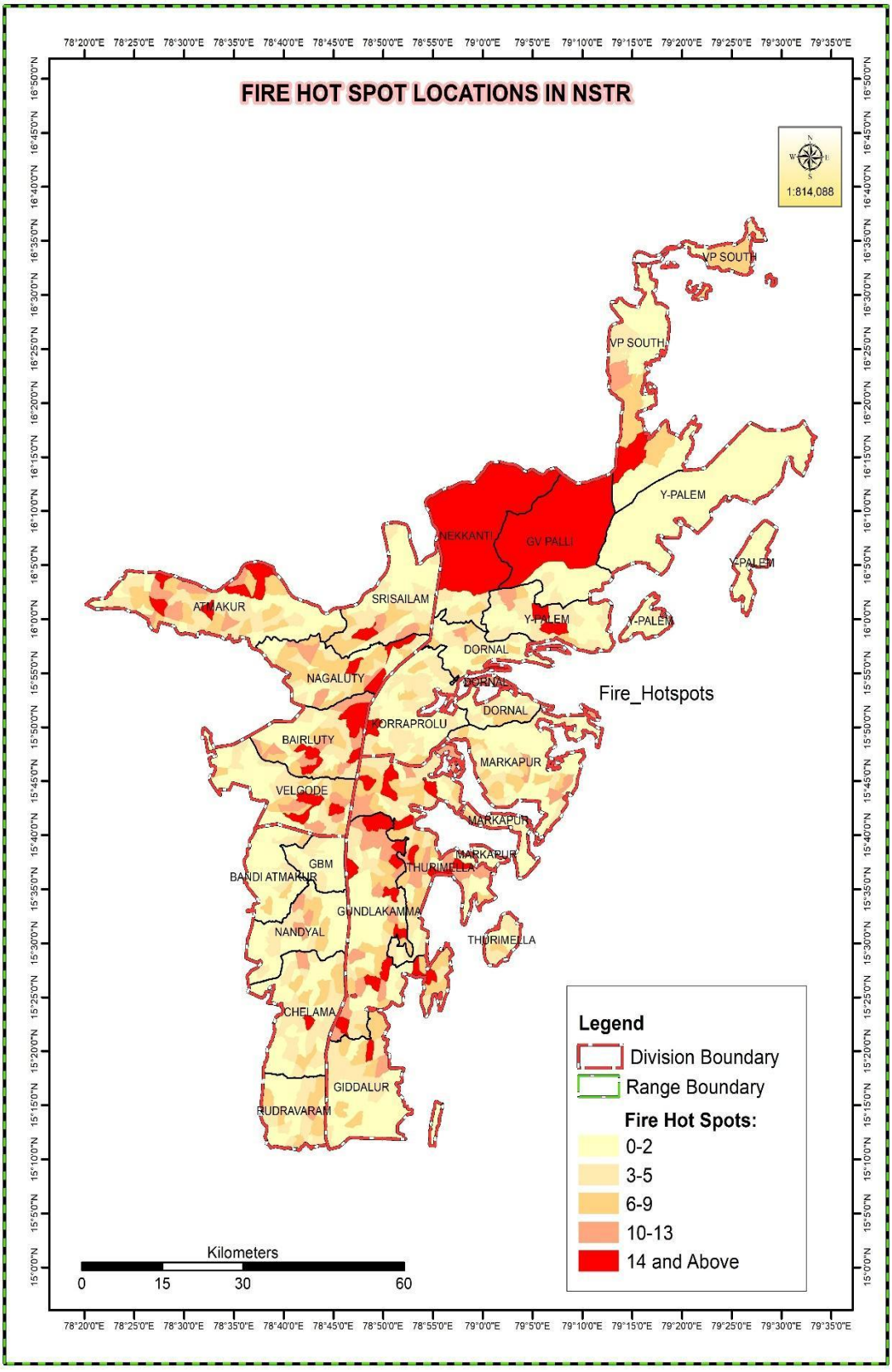
Table 31: - Year wise fire incidents (2013 to 2025)

Years	Atmakur		Markapur		Nandyal		Giddalur		NSTR Circle	
	No. of Incidents	Area affected (Ha)	No. of Incidents	Area affected (Ha)	No. of Incidents	Area affected (Ha)	No. of Incidents	Area affected (Ha)	No. of Incidents	Area affected (Ha)
13-14	0	0	109	112.50	66	50.50	142	270.00	317	433
14-15	232	99.58	226	198.25	79	41.88	123	643.50	660	983
15-16	154	121.74	190	141.50	79	48.41	100	225.00	523	537
16-17	309	290.69	277	172.84	41	21.55	99	184.10	726	669
17-18	647	219.13	334	198.68	496	142.55	512	76.80	1989	637
18-19	948	234.71	753	386.06	534	85.26	1181	177.15	3416	883
19-20	741	264.79	836	462.21	683	106.34	670	113.65	2930	947
20-21	974	262.03	1075	571.21	291	41.44	1442	197.45	3782	1072
21-22	1006	252.88	1422	804.54	1038	96.93	690	103.50	4156	1258
22-23	1090	267.79	582	361.62	635	68.32	1349	102.84	3656	801
23-24	1037	100.79	1106	483.58	1028	126.97	1081	88.84	4252	800.18
24-25	906	239.36	1038	579.65	779	84.96	615	99.83	3338	1003.8

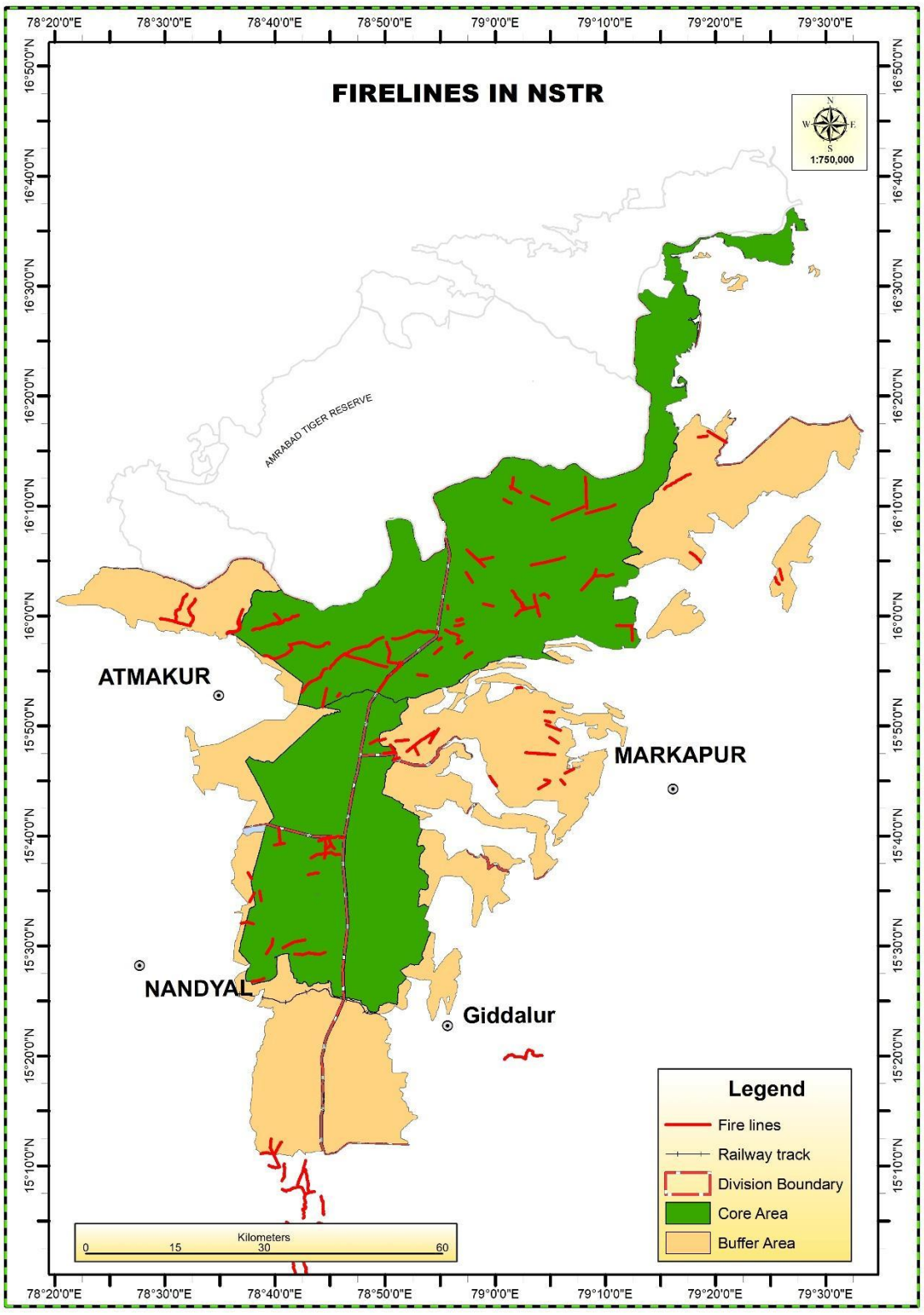


Due to fire protection measures taken in the NSTR, the incidences of fire have reduced by 10% in Markapur Division, and there is a 50% reduction in parts of Project Tiger, Nandyal, particularly in the GBM sanctuary area. The increase of fire lines, timely implementation of fire protection measures, proper equipment for fire protection, and improvement of roads to the extreme corners of the Reserve are the primary actions to be undertaken. Many times, fires may not be extinguished due to inaccessibility of certain areas.

Map:36 Showing the Fire Hot Spot Locations in NSTR



Map:37 Showing the fire lines in NSTR



8 **Road Connectivity / Communication**: The availability of road connectivity is very low in NSTR when compared to the other tiger reserves of the country, there is not of much improvement of roads during the period of last (15) years except the very few roads i.e., Garigelladinned to Dovakunta, Gummadipuram, Chdrampenta to Kothapalli Road, velgode base camp road, Pangidi to velgode south road and roads towards to basecamps of Bilvavanam and Neeliganga Base Camps. New culverts constructed near Rollapenta road, Pangidi west area, Gaddivamulu – Bapanikonda, Muttudu, Ontikurava and Old isukagundam in the maintenance of roads during the period. (4) Causeways were constructed in GBM and one causeway constructed in the Eco tourism zone of Nagulaty range.

9. There was presence of extremists prior to 2013 in NSTR. Due to reduction of extremism in NSTR the Communication network i.e., particularly of Wireless communication is improved. Total no of Wireless infrastructure available before 2013-14 in NSTR are Wireless base stations -13 & Walky-talkies-21 and 64 Wireless base stations and 75 walkie talkies have added to the existing infrastructure. The new technology adopted in NSTR M-STrIPES Mobile app & Ecological App in all divisions and in the division of Nandyal purchased of 5 No. of Mobile tabs and 14 No. of Mobiles, distributed to the frontline staff.

10. 29 new vehicles purchased in the Divisions of Atmakur (7 nos), Markapur (15 nos) and Giddalur (7 no.s). Water tanker & Tractor with trolleys of (5) units were added to facilitate the filling of water in saucers during the pinch period and for the other works in the NSTR in Atmakur, Markapur and Project Tiger, Nandyals. One Animal rescue Van equipped with all infrastructure which include to treat any injured animal, capturing of any carnivore animal in conflict time.

11. Regarding the Construction of buildings in the NSTR during the plan period (5) Office buildings were constructed, renovated, seven residential buildings for the accommodation of FSO /FRO.s were constructed. The uncontrolled vehicles into Srisailam and other areas requires huge monitoring, to have the proper monitoring and collection of Eco cess in certain points, a total of nine Check posts were erected in the reserve and they are one in Bairuluty, one in Srisailam, one in Korraprolu Range, one in Yerragonda palem, three in VP South Range, one in Chelama Range and one in Gundlakamma Range. Check posts were constructed at all nine places.

12. **Habitat improvement works**:

(a) The shortage of water during the pinch period in the Reserve, to provide the water to wild animals during the period, (71no.s) Solar Bore wells were installed. These are taking care of most of the requirement of Water for wild animals. The Solar bore wells are well distributed in the entire Reserve. Details of Division wise are

Table 32: - Details of Division wise bore wells

S.no	Name of Division	No. of Borewells with Solar System.
1	Atmakur	14 (Atmakur Range-1, Bairluty Range-4, Nagaluty Range -2, Velogode Range-5 & Srisailam Range-2)
2	Markapur	26 (Dornal Range-4, Korraprolu Range-5, GV.Palli Range-8, Nekkanti-1, Y. Palem-2 & VP.South Range-6)
3	Nandyal	13 (Chelama Range-1, B.Atmakur Range-1, GBM Range-1 & Rudravaram Range-2)
4	Giddalur	18 (Gundlakamma Range-15 & Tirumala Range-3).
	Total	**71**

(b) The desiltation of tanks, Cheruvus, Kuntas were undertaken and desiltation were completed in (219) units across the tiger reserve, namely Atmakur (16.nos), Markapur (19.no. s), Nandyal (162 no.s) and (22.no. s) in Giddalur.

(c) In addition to the solar borewells, desiltation of tanks New Check dams were constrcted across the Tiger Reserve. A massive total of 143 no.s of Check dams were constrcted in all the (4 no.s) divisions. The split up is Atmakur (20 no.s), Markapur (50 no.s), Nandyal (5 no.s) and (68.nos) in Giddaluru Division.

(d) Saucer pits were created in the NSTR to meet the requirement of water for wild animals during the pinch period across the tiger reserve following basic protocols for creating Saucers. During the plan period 397 No.s saucer were created in all the four divisions viz., 69 in Atmakur, 126 in Markapur, 90 in Nandyal and 112 in Giddalur Divisions.

(e) Sambar was the principal prey in the Tiger Reserve for the Tiger; hence wallowing provision were made exclusively with the object of Sambars in the Reserve. Based on the distribution and necessity (14) places were selected and wallows were created.

(f) Soil and Moisture Conservation works were also carried in the NSTR with an object to increase the water regime or ground water level which in turn facilitate the fodder for the herbivore. Moisture conservation increases the period of greenery in the Reserve, so that herbivore enjoys the fodder little more period. The works which were carried out are RFD.s, Mini Percolation Tanks and Continuous Contour trenches. Over all the executed works during the period are 272 Mini percolation tanks, 113 no.s RFD.s, 842 no.s of CCT.s and PPT.s of 9.1 Km.

(g) Under habitat improvement works attmpts have been made to raise fodder plots also in various locations of NSTR except in Giddaluru Division. 67 Units of fodder plots were raised to augment the fodder for herbivore in the Reserve which are distributed in Markapur (50.nos.), Atmakur (5 no.s) and Nandyal (12 no's).

(h) Though natural salt licks are available in the Reserve, additional salt licks were provided near to the saucers and also at appropriate places. During the plan period 13740 Kgs salt licks were used in the Reserve.

13. Regarding the wildlife health, training programmes were organised for veterinarians in all the divisions and Cattle vaccination programmes were organised to prevent epidemics in wild animals. There are no epidemics during the period. Necessary drugs Xylazine, Ketamine & Yohimbine and sufficient immobilisation equipments were procured and attending the man animal conflicts in the Reserve.

14. **Eco-Development:** With the object of reducing the dependency on the forests, to increase the financial status of the villagers many eco development works were carried out viz., training the sewing machine sewing / tailoring, providing sewing machines, Providing Bio gas plants, LPG Connections to the fringe villages and RO plants for clean drinking water in the nearby villages and Solar Street lights provided in the villages basing on the priority and necessity. In addition to the Eco development works, all the base camps, striking forces, Animal trackers, ecotourism areas of Pecheruvu, Bairuluty, Thummalabailu, Ethipothala and other areas more than 500 Chenchus were given employment, creating employment to the local chenchus was one of the major strategy of success of protection of wildlife and forests in the NSTR.

15. **Amenities to Staff:** Project allowance to the staff members is paid regularly in the Reserve. Base camp watchers, Strike forces, Animal trackers, CBET persons and

Frontline staff were provided the basic amenities which include Rice drum, torch light, Cots, Safe drinking water, Bottles, Blankets, Chaddars, Mosquito nets, Trunk Box, Cooking vessels, First aid box, Solar Street lights, LPG Gas, Shoes, Rain Coats, Uniform, Caps, Jackets etc., During the plan period the following persons were given awards.

1. Sri M. Kondanna, Forest Beat Officer, Gummadapuram Beat, Atmakur Range, Atmakur WLM Division awarded with A.P. Vana Samraksha Pathakamu (Bronze).
2. Sri S. Chandra Shekar, Forest Range Officer, Nagaluty Range, Project Tiger, Atmakur awarded withA.P Vana Samraksha Pathakamu (Bronze)
3. Sri T. Venkateswarlu, Forest Beat Officer (MTS) Pangidi Beat, Velgode Range, Project Tiger, Atmakur awarded with A.P Vana Samraksha Pathakamu (Bronze)
4. Sri J. Ravindranath Tagore, Forest Beat Officer, Sundipenta, Srisailam Range, Project Tiger, Atmakur awarded with A.P. Vana Samraksha Pathakamu (Bronze)

16. Eco-tourism: Eco tourism was developed during the plan period and running successfully at Thummala bailu, CBET Bairluty and Pacherla. At Bairluty and Pacherla tented accommodation, cottages, Dormitory, Environment Education Centre, Yoga Centre were created. For the facilitation of the visitors, jungle safaris were provided at all the three places. In addition to Jungle Safari, trekking routes were identified and trips were organized on request. However sustaionable Ecotourism practices to be adopted.

Table 33: - Details of year wise revenue realized in Eco-tourisms (2013 to 2023)

Sl. No.	Name of the Eco-Tourism	Year wise revenue realized						
		Date of Functioning	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
1	Bairluty of Atmakur Division	10-07-2017	49.608	57.567	39.732	31.218	26.992	76.172
2	Thummalabailu of Markapur Division	20-12-2017	3.840	9.173	6.258	4.004	8.651	26.755
3	Nekkanti Jungle Ride of Markapur Division	18-11-2021		-	-	-	50.000	158.580
4	Ethipothala Waterfalls (Veeranjaneyapuram) of Markapur Division	24-04-2007						21.500
5	Pacherla Eco-Tourism of Project Tiger, Nandyal	22-04-2017						27.755
		Total	**53.448**	**66.740**	**45.990**	**35.222**	**85.643**	**310.762**

17. Research: List of research publications last one decade.

1. **Vendrapati Srinivasa Rao and Boyina Ravi Prasad Rao *Asian J. Plant Sci. Res., 2015, 5(3):24- 33 IJAPRR*** International Peer Reviewed Refereed Journal, Vol. IV, Issue XII, p.n. 14-22, Dec, 2017.
2. Srinivasulu, C., Srinivasulu, Bhargavi, and Nageswara Rao, C. A. 2006. Amphibian Fauna of Nagarjunasagar Srisailam Tiger Reserve, Andhra Pradesh. *Rec. zool. Surv. India. Occasional Paper* No., 245: 1-57 (4 pp Plates) (Published by the Director, *Zool. Surv.* INDIA.
3. **Nagulu, V., V.V. Rao and C. Srinivasulu (1998).** Biodiversity of select habitats in Eastern Ghat regions of Andhra Pradesh. In: *The Eastern Ghats*. Proceedings of the National Seminar on the Conservation of Eastern Ghats, March 24-26, 1998, Visakhapatnam. EPTRI, Hyderabad & Andhra University, Waltair, pp. 6-35.
4. **Rao, R.K. (1998).** Nallamalai Hills – among world centres of plant diversity. In: The *Eastern Ghats*. Proceedings of the National Seminar on the Conservation of Eastern Ghats, March 24-26, 1998, Vishakapatnam. EPTRI, Hyderabad and Andhra University, Waltair, pp. 317-321.
5. **M. Ramesh, N. Khader Valli, S. Sarvanan** new record of *Dorysthenes rostratus* (Fabricus 1793) in Nallamala hill ranges, A.P, India. Current Biotica **9(3): 278-280, 2015.**
6. **M. Ramesh, N. Khader Valli, S. Sarvanan** new record of *Cerapterus latipes* (Swederus 1788) from Nallamala hill ranges of A.P, India. Current Biotica **10(1): 87-88, 2016**.
7. **Anil Kumar.M, Sreenath.A, Anjaneyulu.P, Sarvanan.S, Ravi Prasad Rao.B**. July 2018.*Themeda helferi* (Panicoideae: Poaceae) A new record for India. Rheedea **28(1): 57-61.**
8. **T. Shali sahib, Md, Obaidullah, D. Sameer, M. Naveen, Ameer ahmed** Ethanobotanical studies of pteridophytes of Nallamala Forest International journal of Botany studies ISSN: 2455-541X, impact factor: **RJIF5.12. Vol.5; issue5; 2020, Page No. 304-306**
9. **Siddhant kumar**, Ecosystem evaluation Nallamala forest, India. **November 2020** research gate.net/publication/345636745

10. **Pasupuleti sivarama Krishna**, Pulicherla Yugandhar, a new species of the genus *Portulaca* L (Portulacaceae) from eastern ghats, India. Journal of Asia-Pacific Biodiversity, **Vol-13, issue-4, 1st Dec, 2020, Page: 755-761.**
11. **Dr. T.Ganesh, Dr. Sheshadri K.S, Ashoka** trust for research in Ecology and Environment, Bangalore. Preliminary study on the Amphibians, Reptiles and Moths diversity and distribution in the Atmakur Division NSTR, A.P. **Technical report: Dt. 30.01.2023**

18. Expenditure:

Over 265 Cores have been spent on the development of the NSTR under various schemes to improve the Protection, habitat improvement, infrastructure facilities, monitoring and other day to day necessity works during the plan period. The abstract is as follows. The detailed scheme wise expenditure details are on the adjoining page.

Table 34: - Details of year wise and scheme wise expenditure last (10) years (2013-2023)

Abstract of Expenditure details for last 10 Years under various schemes of Project Tiger Circle, Nandyal												
Sl No	Schemes	Financial Year										Total
		13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21	21-22	22-23	
1	2	3	4	5	6	7	8	9	10	11	12	13
1	Non Plan	104.121	39.777	17.063	9.721	15.372	9.848	4.250	2.920	3.062	6.000	212.134
2	State Plan Schemes	83.656	153.614	82.757	137.029	445.336	716.779	669.344	244.580	458.210	387.776	3379.081
3	CSS Schemes	108.743	31.606	259.763	395.830	387.270	326.608	256.916	439.283	38.169	352.598	2596.786
4	Other Schemes	1598.335	1857.125	1913.761	1701.821	1290.159	2136.428	2176.933	1519.277	2910.549	3247.546	20351.934
	Grand Total	**1894.855**	**2082.123**	**2273.344**	**2244.400**	**2138.137**	**3189.663**	**3107.442**	**2206.061**	**3409.990**	**3993.920**	**26539.935**

CHAPTER – 5

The Critical Tiger Habitat and Interface Land use Situation



5. 1. LAND USE CLASSIFICATION:

The core area of the Reserve consists mostly of Reserve Forests, with a few patches of Protected Forests and unclassed forests. Presently, there are 23 villages inside the Reserve. The land use of villages inside the sanctuary consists of agriculture. Most of the villages grow paddy as a major crop; the second crop may be corn or *jowar* (Sorghum). The crops are mostly rain-fed, supplemented by irrigation from village tanks.

5.2. SOCIO-ECONOMIC PROFILE OF VILLAGES:

As the scheduled census of 2021 has not yet commenced, considering the 2011 Census, the population of united Andhra Pradesh is 76.21 million (7.4% of the country's total population), of which 55.40 million is rural. The overall population density is 275 per km^2. The Scheduled Caste population is 12.33 million, representing 16% of the State's population, whilst the Scheduled Tribe population is 5.02 million, accounting for 6.6% of the State population (up from 5.9% in 2001). While the country's decadal growth rate of population is 21.34%, Andhra Pradesh has registered an increase of only 13.86% (1.4% per annum) during 2001–2011..

Map 38: Showing the Core Villages in NSTR

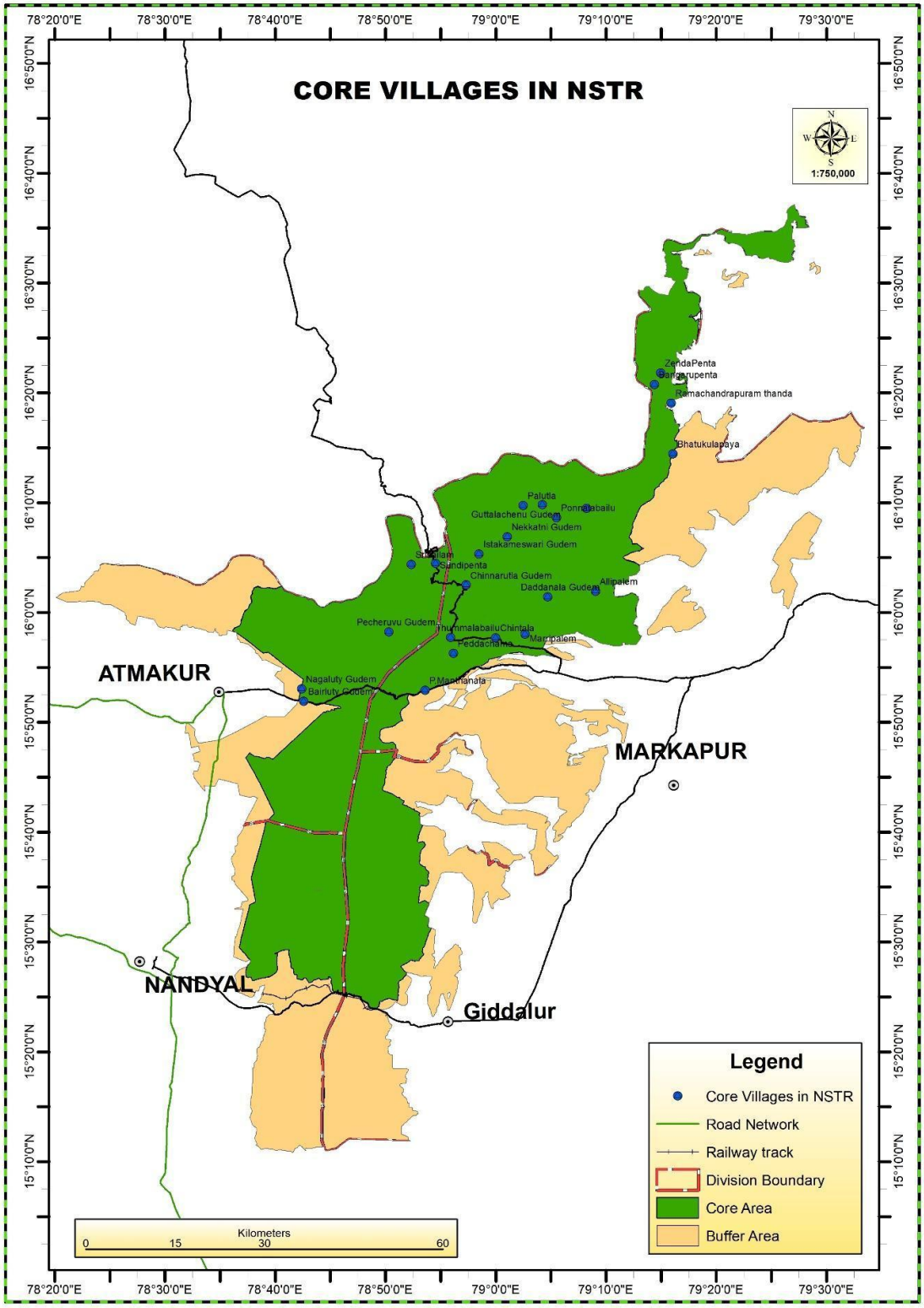
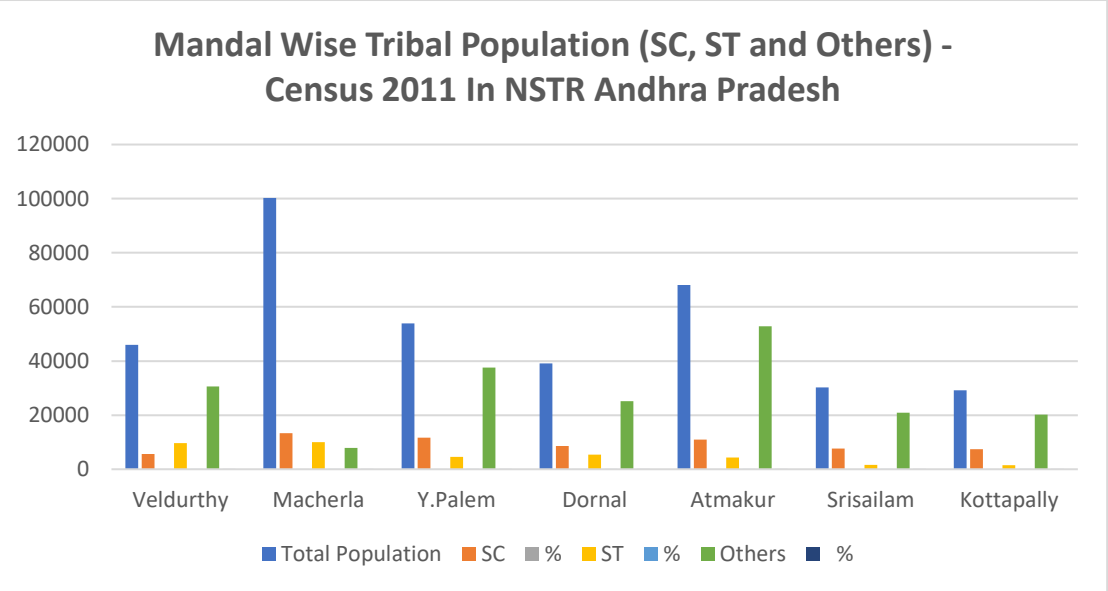


Table 35: Mandal-wise tribal population (SC, ST and Others) - Census 2011 in NSTR Andhra Pradesh

S No.	Name of the Mandal	Total Pop	SC	%	ST	%	Others	%
1	Veldurthy	45927	5668	12	9669	21	30590	66.6
2	Macherla	100218	13330	13	10019	10	7,869	76.7
3	Y.Palem	53874	11704	22	4626	9	37544	69.7
4	Dornal	39149	8578	22	5457	14	25114	64.1
5	Atmakur	68131	10939	16.1	4316	6.3	52876	77.6
6	Srisailam	30265	7696	25.4	1646	5.4	20923	69.2
7	Kottapally	29126	7430	25.5	1482	5.1	20214	69.4
	Total	**366690**	**65345**		**37215**		**195130**	



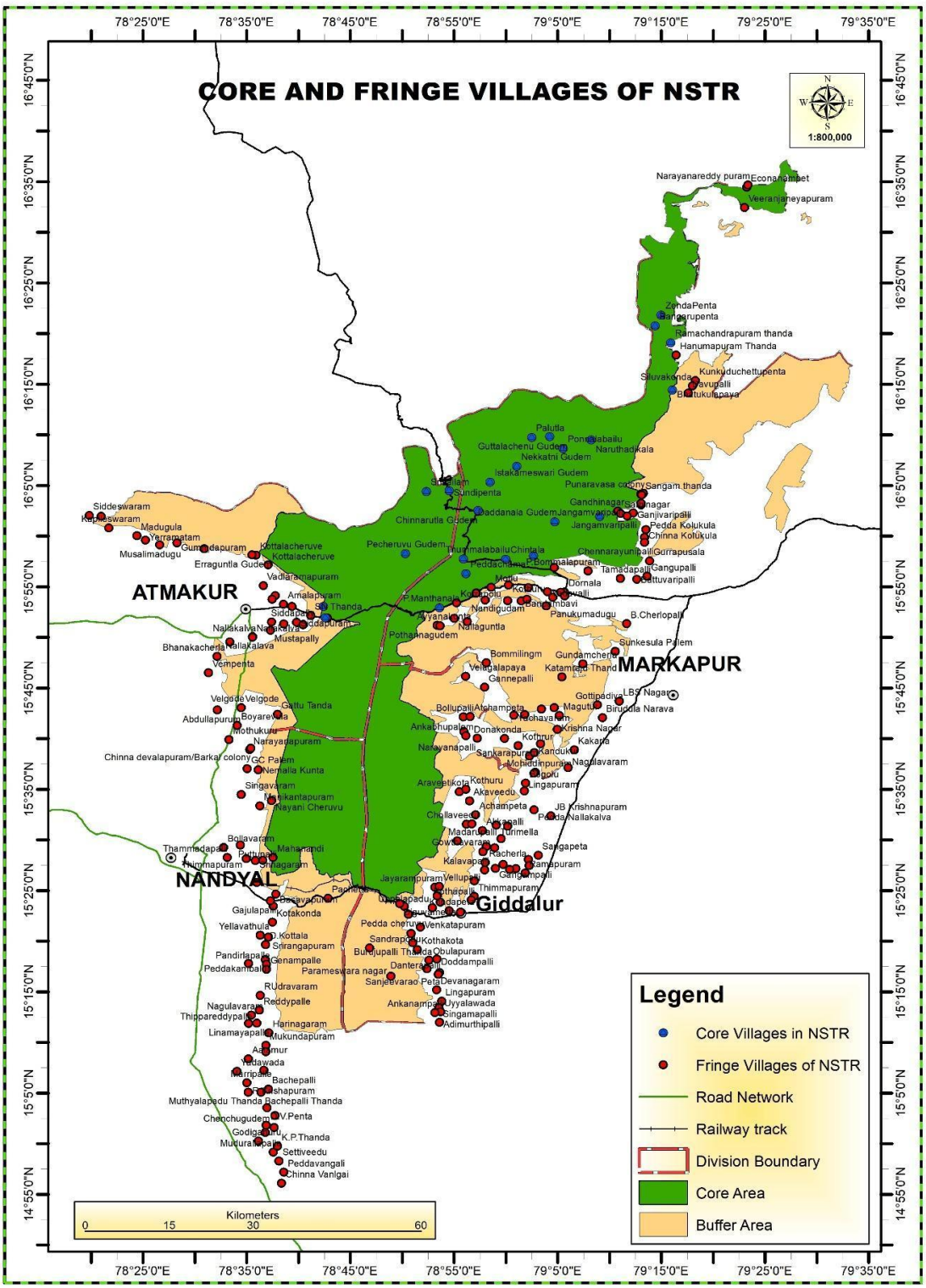
5.2.1. Habitations:

About 85 villages are situated in and around (≤2 km.) the Tiger Reserve. There are 21 villages in the Core area. About 557 families with a population of 4500 live in these villages.

Table 36: District wise, no. villages in the Core

Sl. No.	District	**WZ** (Core)
1.	Nandyal	05
2.	Palnadu	04
3.	Prakasam	14
	Total	**23**

Map:39 Showing the Core and Fringe Villages of NSTR



5.2.2. Ethnic Identities

5.2.2.1. Chenchus:

The Chenchus are classified under the most Primitive Tribal Groups in the State because of their way of life and their dependence on the forests for food gathering, hunting and collection of NWFP. They have a symbiotic relationship with forests.

There are three types of settlements:

(a) *Pentas*: very small, highly scattered habitation in the forest comprising only a few families. Each habitation has its own territory for the exploitation of forest resources therein;

(a) *Gudems*: typically comprising 3-30 families, many of whom have lands within the forest enclosures but which are not cultivated on a sustained basis;

(b) *Small hamlets:* on the periphery of the area where families are engaged in continuous agriculture, including cash crops such as cotton and sesame.





Lifestyle:

Chenchu's live a simple life. They live in small circular huts of 10 feet diameter, made of Bamboo and Grass. They are dark complexioned and mostly short in physical structure with very good stamina capable of trekking long distances in the forest. Their main source of income is from the sale of minor forest produce like honey, Indian gooseberry (*usiri)*, wood apple (*velaga*), zizyphus (*regu)*, tamarind, wild mango, etc, which they sell to the Girijan Co-operative Corporation.

Food habits:

The Chenchu's basically being food gatherer and hunters, hardly practice cultivation and mostly subsist on tubers, leaves, fruits, honey etc. as listed below. The Chenchus traditionally hunt small game like birds, squirrels, monitor lizard etc. They use dogs,

bow and arrows for hunting small game. Both men and women are fond of drinking liquor which they brew locally using jaggery and the bark of certain plants.

Tubers: Chenchugadda, Elavaragadda, Nulagadda, Chanakuragadda, Kaluvagadda, Tamaragadda, Boddigadda, Chandagadda, Tungagadda, and Dondagadda, Boda gadda; Githa gadda; Javara Gadda, Pulasa Gadda, Thokapulasa Gadda, Varra Gadda, Puli dumpa *(Dioscorea daemona),* Nula Gadda *(Eragrostiella bifaria),* Bhuchakra Gadda *(Meruva oblongifolia),* Yeravala Gadda *(Diascorea oppositifolia),* Cheda gadda *(Amorphophallus paeonifoliius).*





Fruits: Custard apple *(Annona squamosa);* Maredu *(Aegle marmelos);* Jana *(Grewia rotundifolia);* Nela eetha *(Phoenix loureinii)*; Konda nekkara *(Xemenia americana);* Chitimiti pandu *(Gardenia gummifera)*; Morli *(Bhuchanania lanzan)*

Leaves: Kalabanda *(Aloe vera);* Pulichinta Kura *(Oxalis corniculata);* Devadari Kura *(E. monogynum);*

Honey: Thodithi *(wax);* Peddapera *(Rockbee honey)*; Chinna tene / Junti tene; Musari (Tree trunk, burrows)

5.2.2.2. Lambadas:

Lambadas' original home is considered to be Rajasthan. The present-day Lambadas represent the complete transition from pastoral nomads to settled cultivation, and many have turned out to be good agriculturists. Many have migrated from Maharashtra, where they are not accorded Scheduled Tribe status. They are good at cattle breeding and consume a lot of milk and milk products.

5.2.2.3. Others:

There are some people belonging to the Scheduled Caste and Backward Classes. Prominent among them are Yadavas and Vadderas, who mostly depend on forest produce like Bamboo, NWFP, Timber and Smallwood, etc.

5.3. RESOURCE DEPENDENCE OF VILLAGES:

The list of villages district-wise which have an adverse impact along with population details is given in the following table.

Table 37:- District- wise villages which have an adverse impact on the Tiger Reserve

Villages which have a high adverse impact in the core area		Villages which have a medium adverse impact in the core area	
Village	**Population**	**Village**	**Population**
Vadla Ramapuram	2882	Bairluty	513
Siddapuram	1047	Pedda Cheruvu	190
Mustapally	2089	Indireswaram	1221
Peddanathapuram	2768	S.N. Thanda	438
Siddapally	1569	Nallakalava	3085
Guvvalakuntla	3123	Pedda Kolukula	2603
Palutla	150	Marripalem	332
Chintala	407	Sattu Tanda	262
G.V.Pally	1165	P.Manthanala	319
Bomalapuram	3744	Pedda Kolukula	2603

Many of these villages were wholly dependent on the forest resources of the core area of the Tiger Reserve earlier. However, due to protection measures and employment opportunities through the Mahatma Gandhi National Rural Employment Guarantee Scheme in non-forest areas, as well as other schemes, their dependency on the forest resources of the core area has reduced drastically over the years.

5.3.1 Chenchu:

Collection of NWFP is an important source of income for most Chenchu households. Overall, collection of NWFP contributes 6–45% of household income. Employment opportunities as agricultural labourers are limited. Animal husbandry is increasingly being practiced by the Chenchus. A large number of Chenchus are employed by the Forest Department. In recent years, a number of Chenchus have also got jobs in the government as well as in the private sector. A number of them are also successfully running businesses.

5.3.2 Lambadas:

The Lambadas earn their livelihood by raising cattle and selling the milk and milk products besides practicing agriculture. Many of them also run successful businesses or are employed in the government as well as private sector.





NTFP-based tribal livelihoods in NSTR

5.3.3 Farmers:

As most of the region is rain fed, dry land crops are being raised by the farmers. Since the crop yield is not commensurate with the investment, poor farmers are most often trapped in the vicious circle of debt. Measures have been taken up to provide alternate livelihood options.

5.4. HUMAN-ANIMAL CONFLICTS:

5.4.1 Crop Raiding:

Crop damage by wild animals has become the main reason for the conflict between the park and the people. Most of crop damage is caused by wild boars followed by black buck. Sloth bears are often attracted to fruit orchards such as mango, sapota (*Sapodilla*) as well as corn.

5.4.2. Human Wildlife Conflict:

In any protected area, the human component plays an important role. People residing in and around the protected area influence the wildlife. The number of people and their lifestyle have a direct bearing on the wildlife population. Traditionally, Chenchus have drawn their sustenance mainly from forestry work. They occasionally hunt small game

like birds, squirrels, and monitor lizards, which affects the availability of food for carnivores. Thus, they also reduce the food availability for carnivores. However, in the last three to four years, such practices have been on the decline due to increasing protection measures and the spread of legal and conservation awareness among villagers. Communities practicing agriculture near the forest areas suffer from crop damage by wild animals. This brings the villagers into conflict with wildlife. If their crops are raided frequently or their cattle are killed, they sometimes poison the carcasses, which can lead to the death of tigers or leopards. Such cases are also not common now. Sometimes, wild herbivores are killed or trapped by farmers while protecting their crops. The factors mentioned above are the main reasons for man-animal conflict in the area.

MEASURES TO REDUCE MAN-ANIMAL CONFLICT: -

Regular awareness campaigns through posters, pamphlets, seminars, workshops, audio visual programmes, Kalajathara and Vanachaithanya ratham and informal discussion with the people shall be regularly done to create awareness in the fringe villages.

Mitigation measures to address human-wildlife conflict, eco-development activities (i.e., those that take environment factors into account and also benefit local communities) need to be undertaken. Some of them are-

i. Ensure prompt payment of crop compensation.
ii. Educate and create awareness among the people about the harmful effects of use of chemical pesticides (organo-phosphorous) and help assist them to familiarize and acquaint in use bio-pesticides mixed with non-surface tension compounds
iii. To build conservation compatible sustainable resource base to meet the biomass needs of the people and better living standards through economic upliftment and eco-tourism.
iv. To orient Protected Area management to conserve through people's participation in Protected Area management activities and decisions.
v. Ensuring full participation of the stakeholders at all stages of the programme.

5.5. ASSESSMENTS OF INPUTS OF LINE AGENCIES/OTHER DEPARTMENTS:

Rural Development Programmes are being implemented through the Zilla Parishad and other government departments. The works mainly undertaken relate to health, education, communication, veterinary care, agriculture, water supply, electricity supply, tribal development, etc. The Revenue Department takes care of the provision of ration, maintaining law and order, keeping land records, and the distribution of grains, etc. The Integrated Tribal Development Agency (ITDA), under the Tribal Development Department, has started various programmes such as running tribal schools, providing subsidies on agriculture, distributing implements and equipment, offering improved varieties of seeds and cattle, and carrying out various other community works. Regular coordination of these works is undertaken by the Revenue Department. In an all-out effort to develop this area for the well-being of local tribes, various government agencies undertake works of such nature, which could have deleterious impacts regarding compensation issues in the area.

TIGER CONSERVATION PLAN: CORE AREA
PART B: THE PROPOSED MANAGEMENT



Chapter – 6

Vision, Goals, Objectives and Problems



6.1 VISION:

Focus on enhancing the protection of tigers in their natural habitat in perpetuity and earmark inviolate spaces undisturbed for their healthy existence.

6.2 MANAGEMENT GOALS:

- To preserve biological diversity and restoration of ecological integrity of typical Nallamala landscape with a special emphasis on conservation of the Tiger and its habitat in perpetuity by involving local community.
- To ensure the maintenance of viable population of tiger in its natural environment for scientific, economic, aesthetic, cultural and ecological values and to serve as large source population ensuring gene flow into adjoining areas.

- To reduce the resource dependency in surrounding villages and making them self-sufficient by participatory management and to elicit public support and awareness for conservation.

6.3. MANAGEMENT OBJECTIVES:

1. To protect, restore, manage, and maintain representative biodiversity of Nallamalas along with ecological processes and wild gene pool with a focus on Tiger.
2. To ensure full protection of the Tiger Reserve from external and internal threats, which include strengthening protection measures against poaching and control of Forest fires.
3. To protect, restore, and manage the catchments of Krishna and Gundlakamma river systems to ensure the sustainability of the resources and economic prosperity in the region to reduce the dependence of local people on forests.
4. To protect and conserve all rare, endangered, and threatened species with special focus on Tiger.
5. To promote research, monitoring, and adaptive management approaches to ensure management effectiveness and to serve as "Learning Centre". Conducting research in various aspects and monitoring the status of tiger – flagship species, other threatened species of flora and fauna.
6. Consolidation of area (restore the degraded habitats to provide additional space for prey and predator in the Reserve).
7. Special focus on improving corridors, to ensure movement of tigers across the larger Eastern Ghats landscape and also facilitate movement of other key species.
8. To improve the habitat with an objective of optimal prey productivity.
9. To develop the infrastructure for protection and management.
10. To expedite the relocation of existing villages from Core area, their rehabilitation and their sustainable development through eco development through site specific microplans in a phased manner duly convincing the people.
11. To strengthen the detection & enforcement capabilities, enhance scientific competence and communication skills of all cadres of the staff of the Reserve.
12. To provide opportunities for wilderness experience, nature interpretation facilities and conservation education through community based eco-tourism.

13. To take up reintroduction of key species like Indian Gaur which had historical presence in the landscape. This is crucial to increase the preybase for tigers.

6.4. PROBLEMS IN ACHIEVING OBJECTIVES

The primary objective is to protect the biodiversity of the pristine forests of Nallamalas. There are a number of natural grasslands present in the Tiger Reserve. Most of the area is not high forest and various palatable species of grass are present almost throughout the park. Due to the lack of moisture for most of the year, the availability of palatable grass during the dry season is a limiting factor for the herbivore population. During the dry season, water is a limiting factor for wildlife. To increase water availability during the dry season, certain soil and moisture conservation works in the reserve is required. Once moisture is retained in the soil, the availability of fodder/grasses will improve. This will help to boost the herbivore population in the Tiger Reserve. An increase in the herbivore population will result in an increase in the large carnivore population i.e. tiger, leopard and wild dog.

Management of grasslands is an essential component of any Tiger Reserve. In the recent past, comprehensive management of grass lands has not been taken up. As a first step, a thorough survey of all grass lands in the Tiger Reserve needs to be taken up. Based on the survey, scientific management of grass lands can be planned.

6.5. STRENGTHS - WEAKNESSES – OPPORTUNITIES – LIMITATIONS (SWOT) ANALYSES

Strengths:

i) NSTR has a good source population of tigers, which is increasing.

ii) An offshoot of the Southern Eastern Ghats in the state of Andhra Pradesh, NSTR is located in an extremely beautiful, pristine, cultural, and natural landscape. NSTR is the largest tiger reserve in India.

iii) NSTR, with its Rajiv Gandhi Wildlife Sanctuary and Gundla Brahmeswaram (GBM) Wildlife Sanctuary, provides an approach for landscape-level conservation as it is contiguous with Amrabad Tiger Reserve (Telangana State) in the north (Nallamalla Forest) and Lankamaleswara Sanctuary and Sri Venkateswara National Park, extending southwards up to Tirupati.

iv) NSTR is connected to the Seshachalam Biosphere Reserve through forested patches and three protected areas—Sri Lankamalleswaram Wildlife Sanctuary, Sri Venkateswara National Park, and Sri Penusila Narasimha Wildlife Sanctuary. This corridor is important for tiger movement in the landscape and hence must be prioritized for effective conservation.

v) NSTR has documented all individual tigers using unique IDs. Pictures of Phase IV tigers and other species are compiled and presented in the form of an album. These albums are distributed and help in establishing a constituency of supporters for the TR, apart from fulfilling monitoring and management requirements.

vi) The vast collection of museum specimens, ranging from plankton and invertebrates to mammals, in the Biodiversity Laboratory and Wildlife Capacity Building Center (BWCBC) is the result of commendable work done by the NSTR team. The biodiversity of NSTR has been documented and preserved comprehensively in this lab and is visited by students from all across India. The Bio-Lab is being properly maintained and updated by the Tiger Reserve management.

vii) Eco-tourism management at NSTR is at a developing stage, with ecotourism centres established at Bairluty, Thummalabailu, and Pacherla. NSTR has a remarkable bio-park at Srisailam, depicting the evolutionary history of the animal kingdom. It is an excellent ecotourism site.

viii) The corpus funds of the Tiger Conservation Foundation are managed well, and the funds are utilized effectively by the management for the betterment of the TR. However, there is a serious burden on TCF resources due to the non-disbursal of central and state funds for identified planned activities as per the TCP, including wages for protection watchers.

ix) Water in the tiger reserve is restricted to the river Krishna and some perennial streams, like Gundlakamma. Apart from this, a large-scale network of *i* (wells) and *Kuntas* (ponds) is distributed throughout NSTR. There are numerous small and large streams covering the entire tiger reserve, most of which ultimately join the river Krishna. All animals depend on natural water sources as well as artificial water sources developed by the department, which are maintained while new water resources are being developed.

x) Most of the core and buffer areas are under the unified command of the Field Director. Such unified control is a major positive for management, as the reserve is large and spread across three districts of the state. Teamwork and coordination are now visible for the effective management of the TR.

xi) The TR has established a wildlife dispensary for in-house management of rescued and stressed animals.

xii) The reserve has a well-connected wireless network across its length and breadth.

xiii) Anthropogenic disturbance is limited in GBM Wildlife Sanctuary, as it is free from any habitations (Extended Core of NSTR).

xiv) The threat from invasive species is minimal.

xv) Solid waste accumulated due to public roads passing through the TR and the movement of pilgrims has been effectively managed by the TR management.

Weaknesses:

i) In NSTR, 23 villages, comprising around 4,500 people, are located in the Core area, and they are dependent on the forests for fuelwood, fodder, and grazing of animals. There are 69 villages in the buffer. There is a high dependency of the villagers on NSTR for fodder, fuelwood, NTFP, and bamboo. However, this is mainly a problem in the buffer, as in the core many villages are small Chenchu hamlets, called "gudems." The villagers in Palutla and Pecheruvu pose a challenge for wildlife.

ii) Thousands of cattle belonging to the scheduled tribes residing in the Core and Buffer areas wander in the forests for fodder, resulting in habitat degradation. In all base camps, a register for cattle movement is maintained to monitor their movement, and regular immunization programmes are planned.

iii) Illegal fishing activities in the backwaters of the multipurpose dams constructed across the River Krishna at Srisailam and Nagarjunasagar, forming large reservoirs within the boundaries of the Core of the Tiger Reserve, are a major concern. Though joint operations by Amrabad Tiger Reserve (Telangana) and NSTR along the common boundary of the River Krishna have effective control, around 1,000 families are dependent on fishing in the River Krishna within NSTR for their livelihood.

iv) Because there are various stakeholder departments in NSTR, notably the Hydro-electric Department, Integrated Tribal Development Agency (ITDA), the migrant fishing community, and other resource users, there is every possibility of conflict between conservation interests and individual interests/non-compatible developments.

v) High pilgrimage pressure and disturbance occur during religious festivals. Famous temples such as Srisaila Mallikarjuna Swamy Temple, Akkamahadevi Temple, Nagaluty Veerabhadra Swamy Temple, Rudrakoteswara Swamy Temple, and Ishtakameshwari Temple are located in the Core area of NSTR. A large number of pilgrims (6–8 lakhs) from Karnataka and Maharashtra visit these temples during Mahasivarathri and Ugadi, disturbing the habitat and wild animals, increasing vehicle pressure, creating litter, intensifying man-animal conflict, and generating forest fires. Controlling the pilgrimage is a challenge for NSTR.

vi) The Dornala–Srisailam (NH 765) and Kurnool–Guntur (NH 340C) highways pass through the Core of NSTR, posing a threat to wildlife and habitat management.

vii) The funds under centrally sponsored schemes and state-sponsored schemes are usually released late to the Tiger Reserve.

viii) Large beat size in NSTR is a hindrance to effective protection and management.

ix) Lack of an elaborate forest road network in the reserve is a constraint for effective movement of staff. A large area of the park is still inaccessible due to the undulating terrain.

x) Fire management in some areas is difficult due to inaccessibility.

Opportunities:

i) Settlement of Chenchu hamlets helps in monitoring any outside intrusion into the tiger reserve. The number of villages to be relocated may be listed, and monitoring should be done to educate the villagers about relocation so that quality meadows can be located in the NSTR, which increases the prey and, in turn, the predator.

ii) Catchment of the Krishna River.

iii) Connectivity to Seshachalam Hills and Amrabad Tiger Reserve has increased the scope for tigers to move freely and expand their distribution. This also ensures reduced conflict with humans.

iv) Resource of unexplored species diversity. The size of NSTR is so large that many areas are still not fully explored. There is a great opportunity for research and new findings.

v) The luxury of space/area gives NSTR an opportunity for increased tiger numbers and can serve as a stronghold for the tiger population in the country.

vi) The tourism potential is huge given the proximity to key cities. With increased tiger and other animal numbers, tourism is bound to increase.

Threats:

i) There are multiple access points to the sanctuary because of the many roads passing through it. Given its large area, patrolling the entire region will be difficult. This increases the possibility of poaching and smuggling activities.

ii) Scarcity of water: 50–60% of the area is devoid of any perennial water resources, resulting in a shortage of green fodder.

iii) Biotic pressure from humans and livestock.

iv) The number of highways passing through the Reserve is a cause for serious concern.

v) High pilgrimage pressure and disturbance during religious festivals.

vi) With the movement of cattle and villages inside the PA, the invasion of exotic weeds can increase.

CHAPTER – 7

Management Strategies



7. MANAGEMENT STRATEGIES

Tiger Conservation Plan 2023-24 to 2032-33 recommends the following management strategies:

a) Habitat Management: -

i. Consolidating and strengthening of 'Source Populations' of the Tiger and managing 'source-sink' dynamics by restoring habitat connectivity to facilitate dispersing Tigers to repopulate the areas by way of co-existence agenda in the buffer, mainstreaming wildlife concerns and fostering corridor conservation.

ii. Strengthening of protection and monitoring related infrastructure within the Critical Tiger Habitat.

iii. Resettlement of impact villages from 'Critical Tiger Habitats' (CTH) within ten years and settlement of rights. Resettlement package to the forest dwellers in the Critical Tiger Habitat will be as per the NTCA guidelines.

iv. Enhancing the water availability in the Core.

v. Enhancing the Communication network by increasing the length of roads, Wireless and optimum use of vehicles.

vi. Fire protection measures to prevent the fire incidence in the Core.

vii. Addressing man-animal conflict issues in a prompt way.

viii. Enhancing financial allocation for ensuring sustainable fund flow, Integration of Management annual Action Plan with other sectoral programmes under TCF, PT, BIO-SAP & CSR etc.

ix. Use of latest technologies like e-eye, drones (unmanned aerial vehicle) and use of sniffer dogs for monitoring and protection of the Tiger Reserve.

x. Ensuring People Participation in Wildlife Conservation through Eco- Research and Monitoring.

b) Capacity Building and awareness creation:

i. Human Resource Development and capacity building.

ii. Promotion of conservation awareness and education.

c) Livelihood enhancement:

Promoting alternate livelihood opportunities of the locals to make them self-sustainable and seeding the concept of eco-friendly living.

d) Tourism zone management:

Tourism zone management. A review will be done after 5 years for mid-course correction of the Tiger Conservation Plan, if needed.

7.1. Delineation of Critical Tiger Habitats and Inviolate Areas.

The main cause of the decline of the tiger and other endangered fauna in human-dominated landscapes is competition and conflict with the growing human population and the demands of modern market-driven lifestyles, as well as the dominance of livestock in the traditional agrarian society of India. So, it is our prime duty to protect our life-supporting system, i.e., the entire ecosystem. The creation of the protected area is part of our strategy to revive our lost paradise. The conservation of the flagship species, i.e., the top predator of our ecosystem, ultimately conserves our entire ecosystem and biodiversity.

The size of the inviolate area within each critical habitat zone will be based on its potential to harbor viable populations of umbrella species (endemic species, top carnivores, mega-herbivores, indicators, wild relatives of species of economic value, endangered and threatened species, and migratory species), which would serve to

conserve the entire biodiversity of the area. Identified corridors of significant wildlife values should also be examined according to the above criteria for delineation as core/critical Tiger Habitat.

As per the provisions of the Wildlife (Protection) Amendment Act, 2006, No. 39 of 2006, dated 3rd September 2006, Section 38V (4) (i), the expression "Tiger Reserve" includes Core or Critical Tiger Habitat areas of Sanctuaries, where it has been established on the basis of scientific and objective criteria that such areas are required to be kept as inviolate for the purposes of Tiger conservation, without affecting the rights of the Scheduled Tribes or such Other Forest Dwellers, and notified as such by the State Government in consultation with an Expert Committee constituted for the purpose.

7.1.1 Rationalization of PA Boundaries:

(i) As per the NTCA guidelines / MEE reports most of the area of Tiger Reserve has been brought under unified command.

(ii) Addition of existing reserve forests adjoining the existing buffer based on the scientific criteria and ecological need for enhanced protection and conservation.

Table 38:
and the details are as follows.

SI No.	Name of the Sanctuary	Total Core area to be notified
1	Rajiv Gandhi Wildlife Sanctuary	1714.68
2	Gundla Bramheswaram Wildlife Sanctuary	1193.68
	Total NSTR Core	**2908.36**

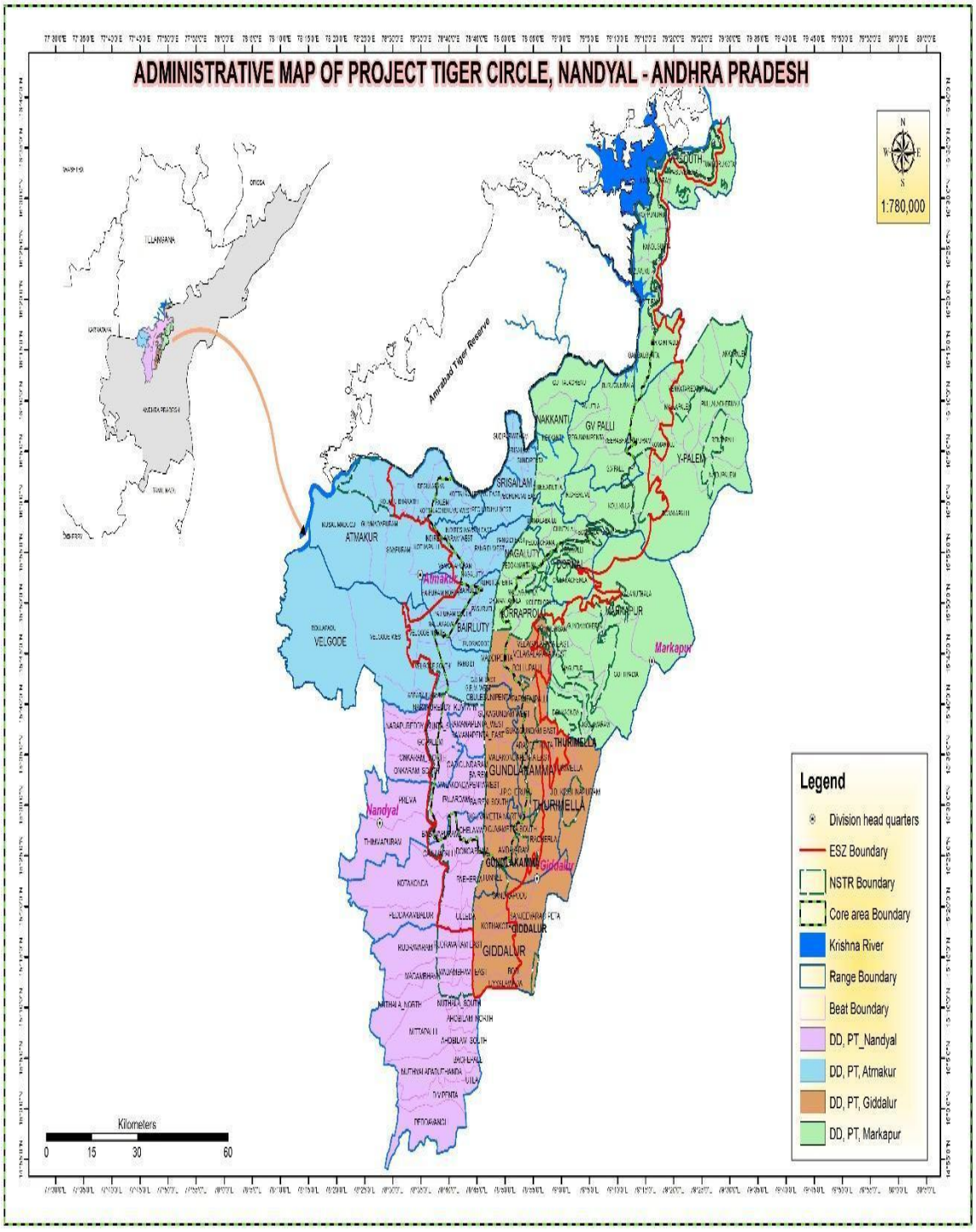
Table 39: As per the latest notification, the Buffer area of NSTR is 2534.46 Sq. Km and the details are as follows.

Sl. No.	Name of the Division	Total Buffer area to be notified
1	Atmakur	464.85
2	Markapur	1063.27
3	Nandyal	392.01
4	Giddalur	614.33
	Total NSTR Buffer	**2534.46**

Timeline of notifications pertaining to Protected Area and Tiger Reserve (NSTR):

- **Rajiv Gandhi Wildlife Sanctuary** is notified under Section 26-A of Wildlife (Protection) Act, 1972 vide G.O.Ms. No.84 EFS&T (For.III) Department, Dt.27-06-1998.
- **Gundla Bramheswaram Wildlife Sanctuary is notified vide Prakasham District** Gazette no. 11, Dated. 18-12-1990 U/s 18 of Wildlife (Protection) Act, 1972.
- **Critical Tiger Habitat (Inviolate area / Core area) of NSTR** is notified under Section 38V of the Wildlife (Protection) Act, 1972 (Central Act. No. 53 of 1972) vide G.O.Ms.No. 148 EFS&T (For.II) Department Dated. 20-12-2007.
- **Extended Core area of NSTR** is notified under Section 38 V of the Wildlife (Protection) Act, 1972 (Act. No. 53 of 1972) vide G.O.Ms.No. 50, EFS&T (For.II), Dated. 18-03-2010.
- **Buffer area of NSTR** is notified under Section 38V of the Wildlife (Protection) Act, 1972 (Act No. 53 of 1972) vide G.O.Ms.No. 54, EFS&T (For.II) Dated. 27-07-2012.
- **Eco-Sensitive Zone of NSTR** is notified vide Extraordinary Gazette published by Government of India, New Delhi vide Gazette no. 4022, Dated. 18-10-2021.

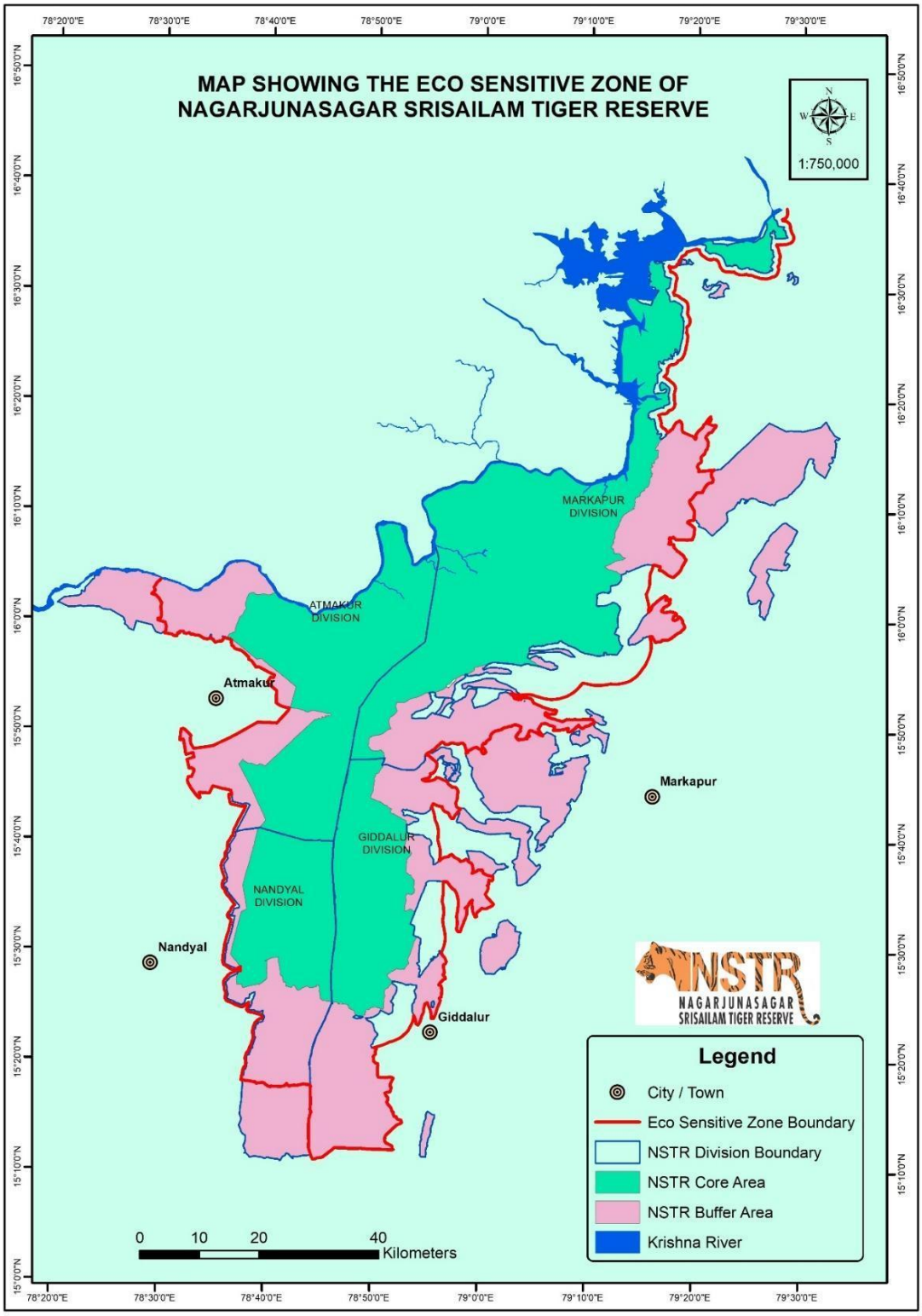
Map-40: Administrative Map of Project Tiger Circle, NSTR



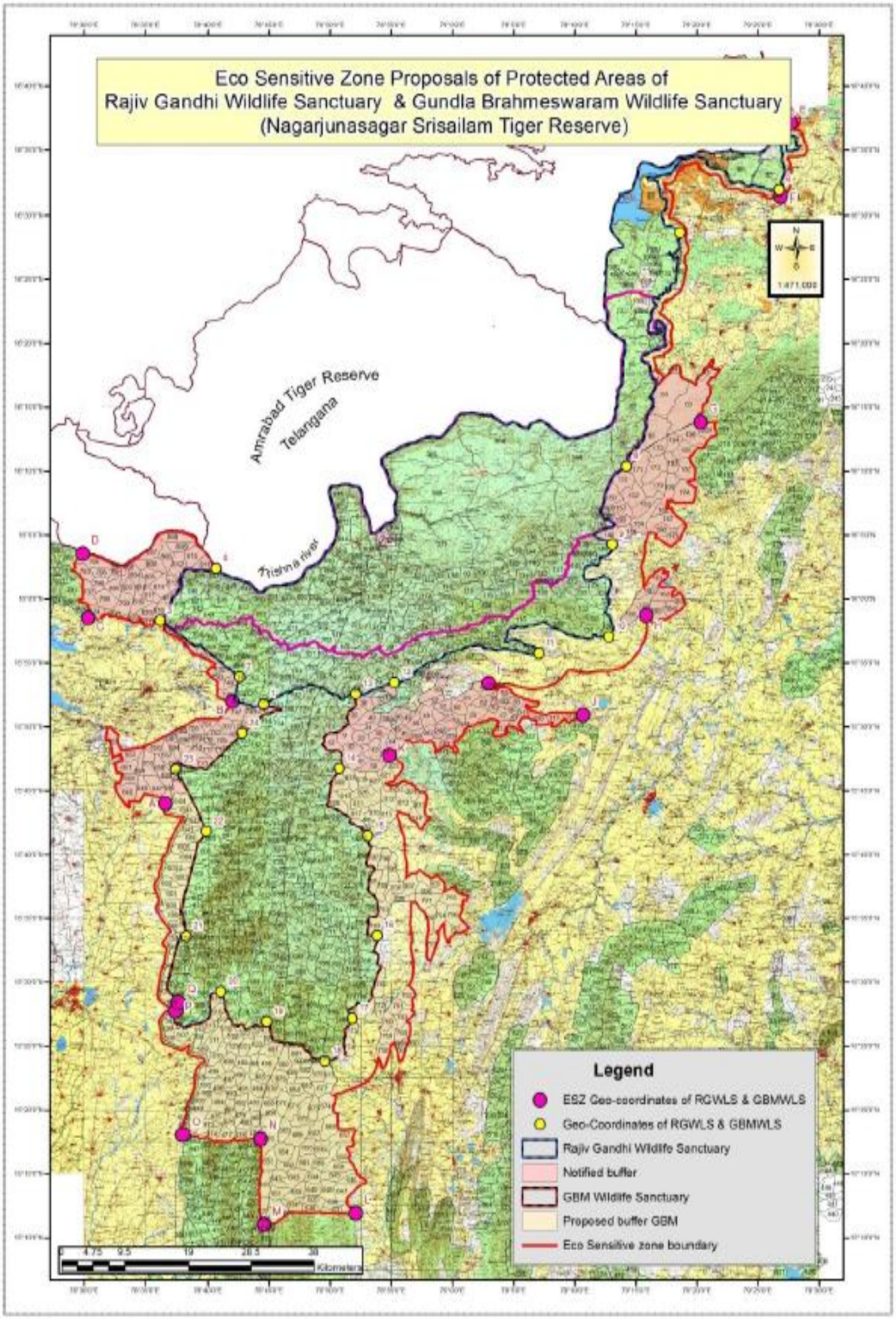
7.1.2. Declaration of Eco-sensitive Zone of NSTR:

The largest tiger reserve of the country, having a huge corridor connecting to Seshachalam Biosphere over 200 kms. The spillover population of tigers of NSTR are occupying various territories up to Sri Venkateshwara National Park. Considering the importance of the movement of tigers, and in view of the protection of tigers, an area of 2149.68 sq. km, more particularly towards the southern side, was proposed as the Eco-Sensitive Zone. As per the Government of Andhra Pradesh instructions, a series of meetings were conducted with concerned District Collectors and heads of line departments, and keeping in view the safety and security of wildlife in its natural environment and livelihood opportunities of the tribals and others, developmental activities outside the Core area of the NSTR, the Government of Andhra Pradesh sent the proposal for declaration of the Eco-Sensitive Zone. The objective of the proposal is to minimize the pressure on the Core area and to provide additional protection to the wildlife all around the Tiger Reserve; wherever there are no reserved forests adjoining the Tiger Reserve, revenue lands have been proposed as Eco-Sensitive Zone. On declaration of this area, there will be additional protection for wildlife and its habitat. Livelihood activities of the villagers, especially farmers whose lands fall in the Eco-Sensitive Zone, will not be affected as there are no restrictions on the ongoing agricultural practices and traditional livelihood activities in the revenue lands outside the forest area. The Government of India, Ministry of Environment, Forests & Climate Change, New Delhi, has issued the final notification of the Eco-Sensitive Zone of Nagarjunasagar Srisailam Tiger Reserve vide notification No. 4022, dated 18.10.2021, covering a geographical area of 2149.68 sq. km. (Annexure – VIII).

Map-41: Map showing the Eco-Sensitive Zone of NSTR



Map-42: Map showing the Eco-Sensitive Zone Proposal of Protected Areas of Rajiv Gandhi Wildlife Sanctuary & Gundla Brahmeswaram Wildlife Sanctuary of NSTR



7.2. ZONE AND THEME APPROACHES TO MANAGEMENT STRATEGIES:

In the proposed management strategies, the Zone and theme approaches have been adopted for NSTR. Different managerial situations and needs can be taken care of by an effective combination of the Zone and Theme plans. A zone is an area of specific management category distinguishable on account of its objectives. Several specific objectives and problems relevant to an identified part of the Protected Area can be recognized as a Management Zone under this approach. Such a management zone would have its own measures and strategies. Zonation is required to achieve the different objectives of management.

Furthermore, various objectives and different problems, created by a combination of factors can be tackled by a theme strategy under which measures can be prescribed. The prescriptions of a theme shall be implemented in all the zones.

The entire area under the plan is divided into following Zones and Themes in the NSTR.

Zone Plans:

1. Zone Plan for Voluntary village relocation.
2. Zone Plan for Eco-Tourism (Separate Chapter).

Theme Plans:

1) Theme Plan for Water Resource Management
2) Theme Plan for augmenting natural preybase and predator
3) Zonal Plan for Grassland Management
4) Zonal Plan for Safeguards for Wildlife on Highways
5) Zonal Plan for Reintroduction of wild species including Indian Gaur
6) Zonal Plan for In-situ Re-wilding enclosure and capacity building
7) Theme Plan for Climate Change Mitigation
8) Theme Plan for Forest Fire Management
9) Zonal Plan for Religious Green Pilgrimage in NSTR
10) Theme Plan for Anti-Poaching & Security Plan (Chapter 10: Protection and Intelligence Gathering)

7.2.1. Zone Plans:

Following different zone plans are proposed: -

7.2.1.1. Zone Plan-I: Voluntary Village Relocation:

In NSTR, there are twenty three (23) villages inside the Core area of Tiger Reserve, comprising of around 4500 people are located in the Core area and they are dependent on the forests for fuel, fodder and for the grazing of animals. Inviolate space can be enhanced by relocating the villages from the Core area in a phased manner. The consultation process has started and the household census need to be carried out as per the Govt. of India/NTCA norms.

Table 40: Details of Villages falling in Core area of NSTR

Sl.No	District	Division	Range	Beat	Village	Lat	Long
1	Nandyal	PT, Atmakur	Bairluty	Bairluty	Bairluty Gudem	15.86521	78.70962
2	Nandyal	PT, Atmakur	Nagaluty	Nagaluty	Nagaluty Gudem	15.88403	78.70649
3	Nandyal	PT, Atmakur	Srisailam	Srisailam	Srisailam	16.07281	78.87209
4	Nandyal	PT, Atmakur	Srisailam	Sundipenta	Sundipenta	16.07432	78.90883
5	Nandyal	PT, Atmakur	Srisailam	Pecheruvu East & West	Pecheruvu Gudem	15.97046	78.83825
6	Prakasam	PT, Markapur	Y.Palem	T.R.Cheruvu	Daddanala Gudem	16.02338	79.07875
7	Palnadu	PT, Markapur	V.P.South	Gottipalla	Ramachandrapuram thanda	16.31755	79.26504
8	Palnadu	PT, Markapur	V.P.South	Gottipalla	ZendaPenta	16.36353	79.2494
9	Palnadu	PT, Markapur	V.P.South	Gottipalla	Bangarupenta	16.34568	79.23977
10	Palnadu	PT, Markapur	V.P.South	Gangalakunta	Bhatukulapaya	16.24032	79.26775
11	Prakasam	PT, Markapur	Nekkanti	Chinnarutla	Chinnarutla Gudem	16.042	78.95544
12	Prakasam	PT, Markapur	Nekkanti	Nekkanti	Istakameswari Gudem	16.08866	78.97474
13	Prakasam	PT, Markapur	Nekkanti	Nekkanti	Nekkatni Gudem	16.11473	79.01749
14	Prakasam	PT, Markapur	Nekkanti	Guttalachenu	Guttalachenu Gudem	16.1635	79.07049
15	Prakasam	PT, Markapur	Korraprolu	P.Manthanala	P.Manthanala	15.88165	78.89322
16	Prakasam	PT, Markapur	G.V.Palli	G.V.Palli	Allipalem	16.03207	79.15097
17	Prakasam	PT, Markapur	G.V.Palli	Burugundala	Naruthadikala	16.15794	79.13708
18	Prakasam	PT, Markapur	G.V.Palli	Regumanupenta	Ponnalabailu	16.14386	79.09195
19	Prakasam	PT, Markapur	G.V.Palli	Palutla	Palutla	16.16218	79.04141
20	Prakasam	PT, Markapur	Dornala	P.Bommalapuram	Marripalem	15.9669	79.04439
21	Prakasam	PT, Markapur	Dornala	Chintala	Chintala	15.96133	78.9998
22	Prakasam	PT, Markapur	Dornala	Thummalabailu	Thummalabailu	15.96181	78.93162
23	Prakasam	PT, Markapur	Dornala	Thummalabailu	Peddachama	15.93801	78.9358

7.2.1.2. Zone Plan-II: Eco-tourism:

7.2.1.2.1 Objectives of Eco-tourism:

The main objective of managing this Tiger Reserve is *in situ* conservation of the Tiger and its habitat. Tourism is only a byproduct of conservation goals. Tourism in its traditional form is not acceptable in wildlife areas. So, the Eco-Tourism concept is put forth for wildlife conservation areas.

According to the definition and principles of eco-tourism as established by the International Eco-Tourism Society (IETS), "Responsible travel to natural areas that conserves the environment and improves the well-being of local people." So, the Eco-Tourism activities should follow the following principles:

- Minimize impact.
- Build environmental and cultural awareness.
- Provide positive experiences for both visitors and hosts.
- Provide financial benefits and empowerment for local people.
- Raise sensitivity to host countries' political, environmental, and social climate.

To achieve the above principle in letter and spirit, the detailed Eco-Tourism Plan, which provides strategies to be adopted as per NTCA guidelines dated 15th October 2012, is prepared.

7.2.1.2.2. Regulation of tourism in Eco-Tourism zone of Core of NSTR:

As per Eco Tourism Plan, less than 20% area of core is permitted for low impact eco-tourism and following regulations have been prescribed.

- Core Management should not manipulate habitat to inflate animal abundance for tourism purpose.
- The water holes, cement-troughs should not be constructed near tourist routes but should be constructed away from road. The existing such cement troughs should also be abandoned within next 2 years and new cement troughs if needed should be constructed away from tourist routes.
- Visitor shall keep a minimum distance of more than 20 meter from all wildlife.
- Cordoning, luring, or feeding of any wildlife in eco-tourism zone by any person is prohibited.

7.2.1.2.3 Tourism Overlapping Zone:

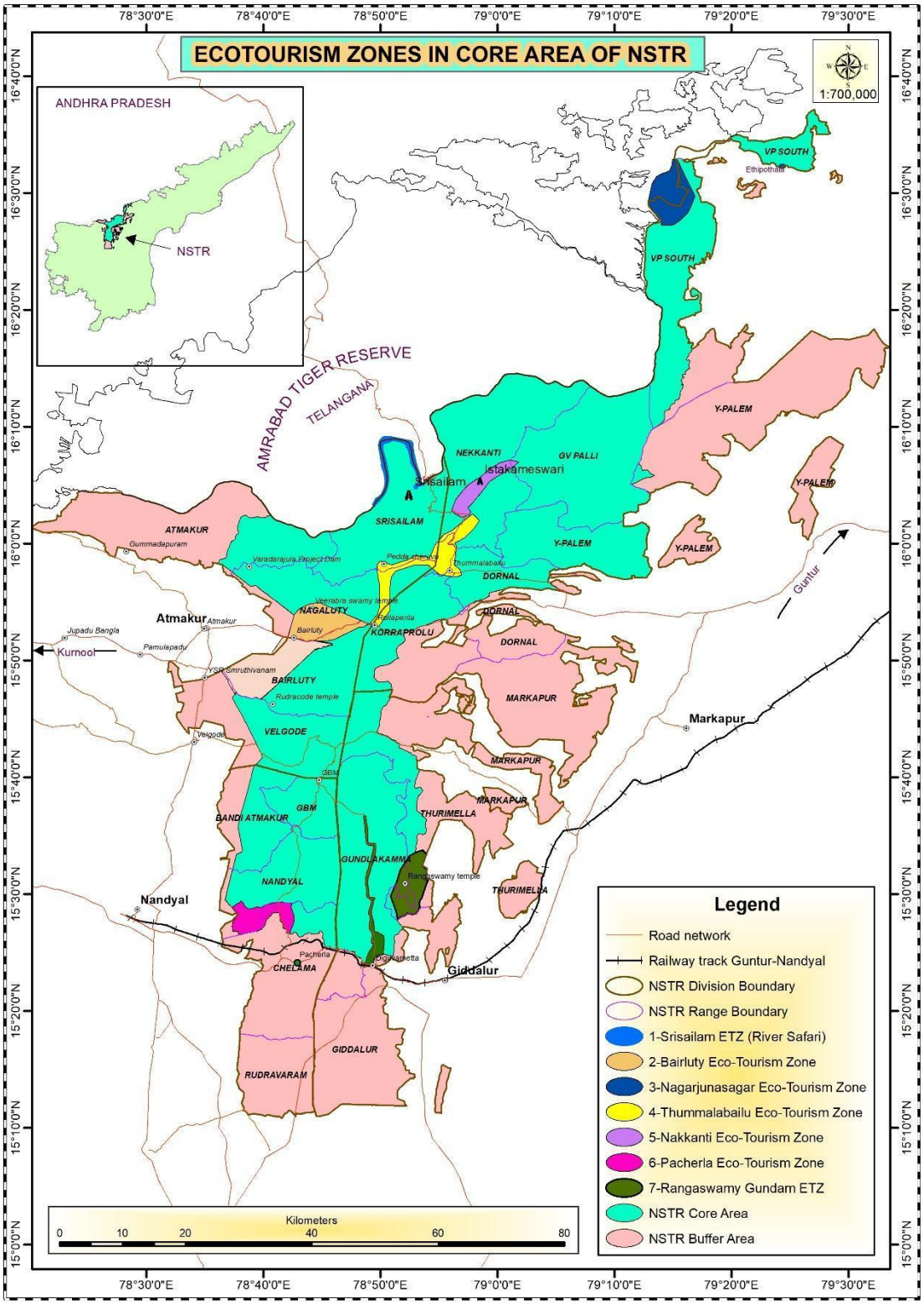
Regulated tourism is permitted with a view to promote conservation education and awareness with minimal disturbance to the wild, and it is in consonance with NTCA guidelines of October 2012. This zone constitutes 251.60 sq. kms, around 8.65% of the core area of the tiger reserve (2908.36 sq. kms). It is well within the limits of restrictions prescribed by NTCA.

The following six tourism zones are identified in the NSTR landscape, which include the core and part of the buffer area adjoining the core. The detailed eco-tourism plan is placed in Chapter 11. However, the details of eco-tourism areas and a map of eco-tourism of the core area are placed below.

Table 41: - Details of Eco-tourism zones in Core area of NSTR

Sl. No.	Name of the Division	Eco-tourism Zone	Core area (in ha)
1	Atmakur	Srisailam Eco-tourism Zone (River Safari)	100
2		Bairluty Eco-tourism Zone	8570
		Sub-Total	**8670**
3	Markapur	Nagarjunasagar Eco-tourism Zone (River Safari)	4680
4		Thummlabailu Eco-tourism Zone	5580
5		Nekkanti Eco-tourism Zone (Nekkanti Jungle Ride)	2400
		Sub-Total	**12660**
6	Giddalur	Rangaswamy Gundam Jungle safari	3830
		Sub-Total	**3830**
		Total	**25160**

Map-43: Map showing the Eco-tourism zones in Core Area in NSTR



7.2.1.2.4 Temple Tourism zone:

The traditional pilgrimages to religious sites are evolving into large-scale religious tourism in many protected areas across India. Sri Brahmaramba Mallikarjuna Swamy Temple, located at Srisailam, attracts 8–10 lakh pilgrims during the two main festivals, namely Maha Sivarathri and Ugadi, every year. Most of these pilgrims walk through the Nagarjunasagar Srisailam Tiger Reserve, starting at Venkatapuram of Atmakur Division and ending at Kailasadwaram near Srisailam via Pecheruvu. The temple townships (i.e., Srisailam and Srisailam Project Colony, also called Sundipenta) have a resident population of around 50,000 individuals. The pilgrims usually start walking through the forest 10 days before each of the festivals. The number of pilgrims gradually increases with each passing day till the culmination of the festival. The distance of the walkway from Venkatapuram to Srisailam is 38–40 km.

As the foot pilgrimage by the pilgrims during Maha Sivarathri and Ugadi festivals inside the Core Area is a centuries-old tradition and a religious belief, it cannot be stopped altogether. The need of the hour is to formulate a Master Plan involving all the stakeholders, i.e., the Srisailam temple authorities, representatives of the two townships, other local bodies, and the Forest Department. The Master Plan should focus on facilitating pilgrims while maintaining the ecological balance in the Tiger Reserve. Issues such as collection, treatment, and disposal of waste, while providing adequate facilities to pilgrims, should be taken up on a priority basis.

The main issues associated with this pilgrimage inside the Core Area and the concerns for the Tiger Reserve Management are disturbance to the habitat, disturbance to the animals during day and night, littering of waste inside the Tiger Reserve, coincidence of the pilgrimage period with pinch period, man–animal conflict, road kills, and forest fires.

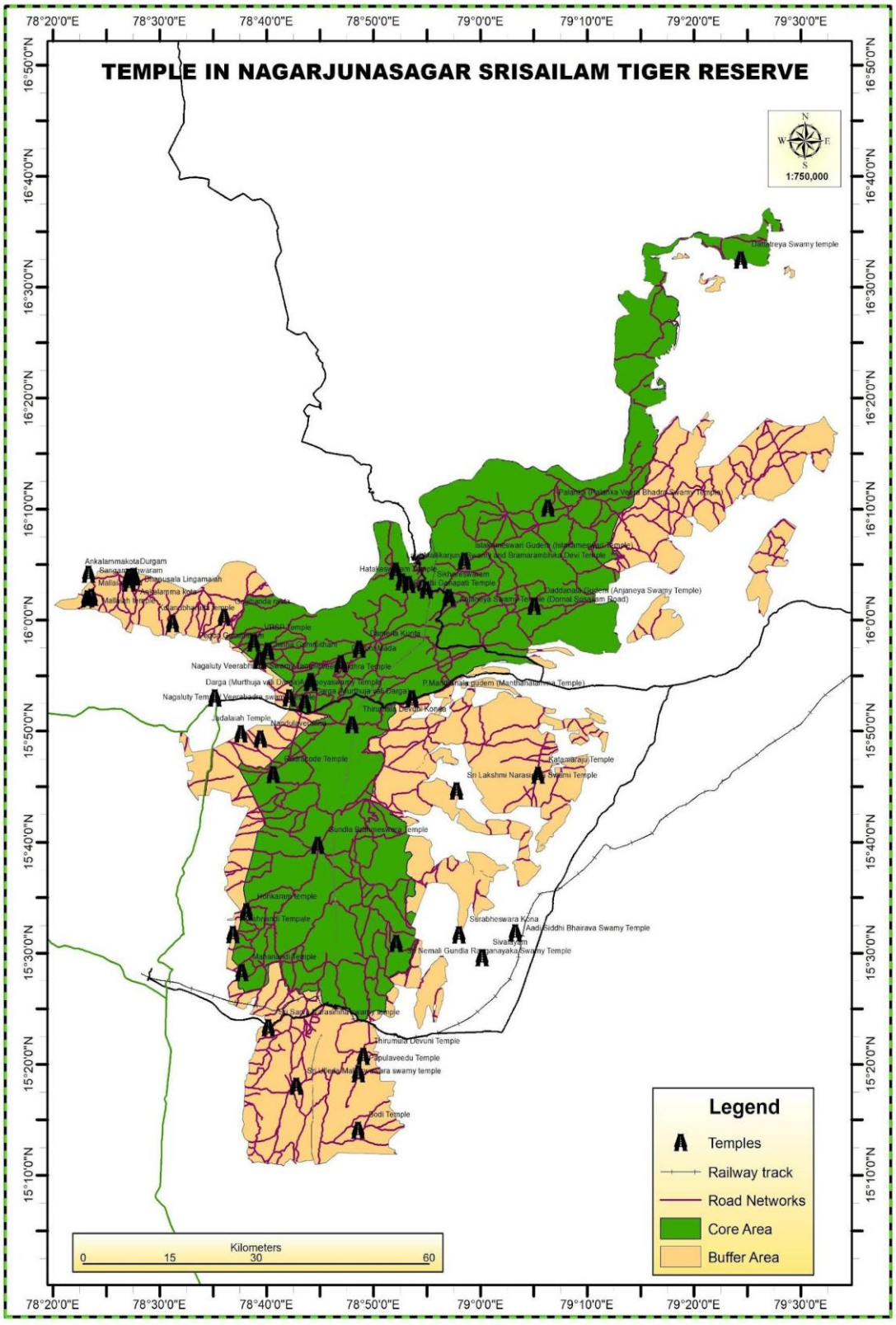
The Nallamalais landscape has numerous temples and is a very important pilgrimage site for Hindus. In addition to the Shri Mallikarjuna Swamy Temple (one of the twelve Jyothirlingas), the other temples are Shri Bhramaramba Devi Temple (one of the Astadasa Shakthi Peethams), Nagaluty Veerabhadra Swamy Temple, Rudrakoteswara Swamy Temple, Ishtakameshwari Temple, Saakshi Ganapathi Temple, Shikaram, Hatakeswaram, Paladhara and Panchadhara, Rangaswamy Gundum Temple, Gundla Brahmeswaraswamy Temple, Mahanandi Temple, Kolanu Bharathi Temple, Sangameswaram, etc. Pilgrim movement shall be regulated by the Forest Department

according to the carrying capacity of NSTR. Garbage cleaning along such pilgrim routes around temples shall be done by temple authorities under the guidance and coordination of NSTR authorities (Field Director). If temple authorities are not able to do so, they shall pay for cleaning as decided by NSTR and temple authorities. Further, any kind of permanent civil structures should not be allowed in forest areas for pilgrim purposes. Only changes notified in the Gazette for a particular temple area can be allowed. NSTR and temple authorities (after permission from the Field Director) may provide necessary and basic facilities like drinking water to pilgrims. No plastic shall be allowed inside NSTR, and temple authorities shall work towards a plastic-free NSTR.

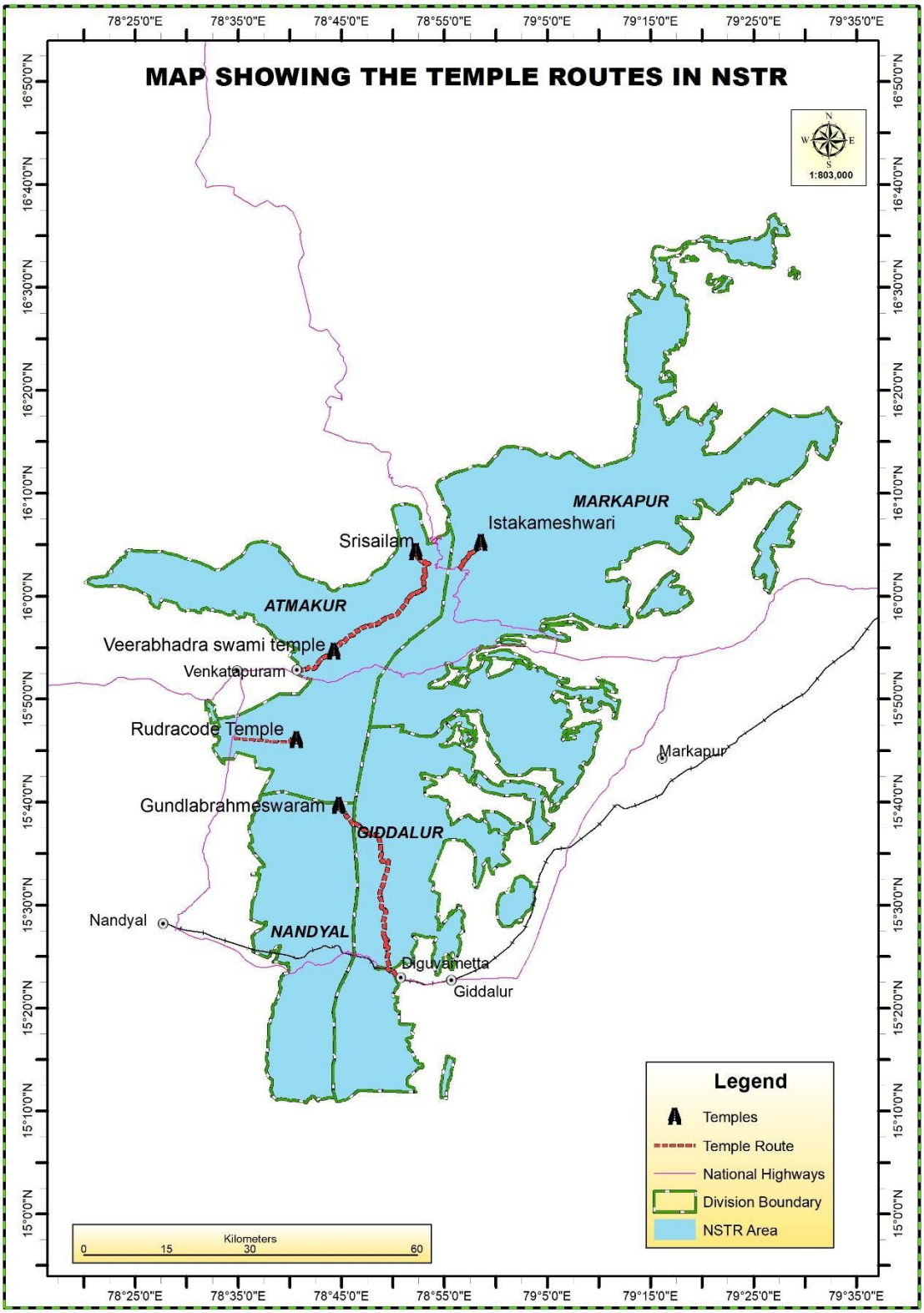
Regulation of Vehicles:

Thousands of vehicles ply between Kurnool – Guntur Road, Dornala – Srisailam Road and Hyderabad – Srisailam Road, especially during Mahasivarathri and Ugadi festivals. There are no nighttime restrictions in the Kurnool – Guntur Road. Detailed proposal regarding threats and suggestions for the management is kept in the Chapter 11 of the Tiger Conservation Plan.

Map-44: Map showing the Temples in NSTR



Map-45: Map showing the Temple Routes in NSTR



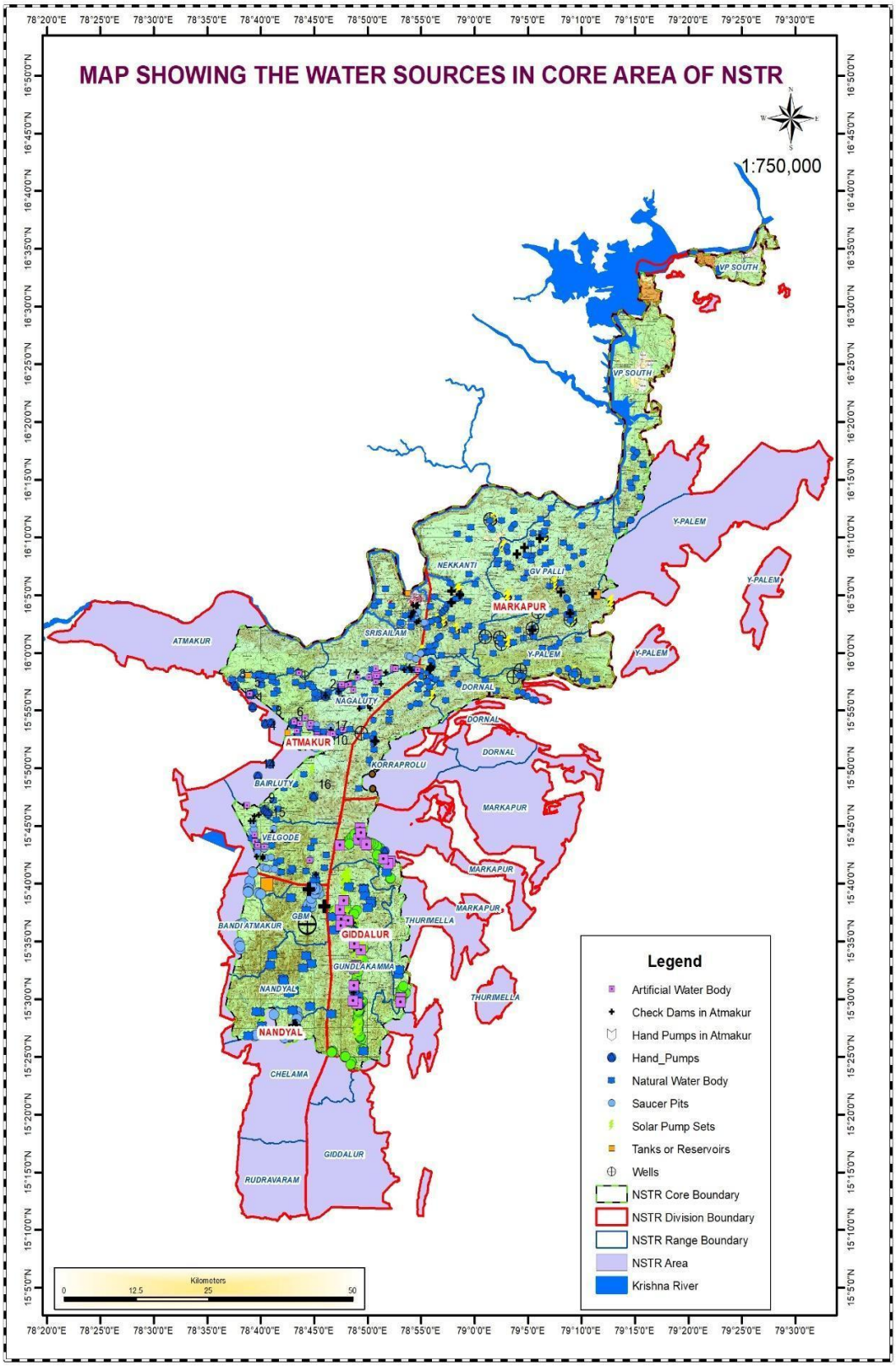
7.2.2. Theme Plans

7.2.2.1 Theme Plan-I: Water Resources Management:

Water is called elixir of life more and so in Nagarjunasagar Srisailalm Tiger Reserve (NSTR). During summer months, NSTR faces acute water shortage in many areas of its Core Zone except the areas where the River Krishna passes through forest areas. The natural water bodies, springs, streams get dried up. Efforts are being taken up to augment the water resources in NSTR.

- Water is an important constraint especially during the summer months, and becomes a limiting factor during the “pinch period”.
- Core areas with scarce water resources have been identified. In such areas, special attention shall be made to develop Soil & Moisture Conservation (SMC) works like impounding Dams, construction of medium to large Percolation Tanks (1400-2000 Sq mtr dimension), Check Dams, Rock Fill Dam (RFD)/Gulley Checks, De-silting & strengthening of existing water bodies/PTs, stop over Dams, Small anicut have to be taken up under various projects.
- Low-cost structures like small earthenbunds, tanks and, seepage springs have to be developed. Annual de-silting of water holes to be carried out as is practice for the last two plan periods.
- More than 150 saucer pits are constructed in NSTR, all the Saucers are filled with water using tractor mounted tankers during summer months.
- More than 110 no.s Solar powered water pumps have been established in Pecheruvu, Damarla Kunta, Naramamidi Cheruvu and Ramaiah Kunta. Some more Solar Water pumps may be established in other places of Core area/Critical Tiger Habitat as per the site-specific requirements.
- There is an immense need to create more than 500 medium to large water bodies/Percolation Tanks (PT) with a dimension of 1400-2200 sq mtr and the PTs shall be connected to nearby streams (Vagu) by digging feeder channels in Core as well Buffer area in next 5 years so as to augment the water resources and to make the Core area water surplus. These activities may be included in Action Plan (Annual Plan Operations) of ensuing years. This will be carried out after study of Sutiability & duly studying the drainage pattern.

Map 46: - Map showing the water resources in CTH (NSTR)



7.2.2.2. Theme Plan-II: Augmenting natural preybase and predator

An active managerial intervention for *in-situ* buildup of tiger and its prey populations was advised by NTCA, *vide* its Lr.No. PS-MS (NTCA)/2008-Miscle Dt. 27-05-2009.

The following line of action is suggested by NTCA in this regard:

i) The in-situ enclosures would contain natural prey animals (supplemented with food provisioning if necessary)

ii) Stepping up protection, using camera traps for recording tiger presence and create an I.D. file for each tiger, beat-wise. (NTCA Lr.No. 15-69/2008 Dated. 20-02-2009).

Enclosures for breeding and releasing prey species (chital, sambar, blackbuck and wildboar) shall be planned in Core / Buffer areas. Identification of areas for creation of enclosure and release of animal shall be planned after a detailed study and the area shall be delineated. Moreover, the project shall be undertaken with soft release or hard release based on the behavior of the animals to be released. Certain suggestive locations are mentioned hereunder.

Table 42: Flat Grassland Areas

Sl. No.	Division	Range	Beat	Remarks
1.	Project Tiger, Atmakur	Srisailam	Sundipenta	These areas have good quality grasslands and plain topography
2.			Pecheruvu (E)	
3.		Bairluty	Bairluty	
4.	Project Tiger, Markapur	Nekkanti	Nekkanti	
5.		Korraprolu	Ch Manthanala	
6.		Dornala	Thumbailabailu	
7.		Nekkanti	Darabailu	
8.		Nekkanti	Chinnarutla	
9.		Y. Palem	TR Cheruvu	
10.		VP South	Sirigiripadu	
11.		VP South	Gangalakunta	
12.	Project Tiger, Nandyal	GBM	GBM	
13.	Project Tiger, Giddaluru	Gundlakamma	Isukagundam	

Once the population of such ungulates within the enclosure has increased, batches of more than 20 ungulates should be released back into the wild. The major preybase for the Tiger and Leopard in this reserve is the Sambar, Chital, Wild boar, Nilgai, Chousinga, Chinkara and the Blackbuck based on scat analysis.

7.2.2.3. Theme Plan-III: Grassland Management:

- Woodland savannahs/grasslands in Critical Tiger Habitat of NSTR constitute the most important part of the habitat mosaic, sustaining the prey populations and, in turn, the predators. Heterogeneous grasslands once were a very important part of the habitat mosaic but are now becoming scarce due to frequent fires and uncontrolled grazing.
- The exceeding biotic pressures and frequent occurrences of fire have contributed to the present deterioration of heterogeneity in the grasslands.
- This situation calls for a strategy to reverse the deteriorating trends and manage the grasslands for sustaining the prey base population in the sanctuary.
- The total number of grass/sedge, legume, forb, and woody species is becoming lesser because of the invasion of fire-tolerants.
- The presence of other annual grass species such as Themeda, Eragrostis, and Dimeria ornithopoda in undisturbed grasslands indicates that some areas are still free from biotic disturbances.
- On the other hand, Heteropogon contortus, which was earlier the less dominant species in some areas, has now been promoted to the most dominant status.
- Other species like Dichanthium annulatum, Themeda quadrivalvis, Bothriochloa odorata, Cynodon dactylon, Imperata cylindrica, and some species of Eragrostis have also been recorded in almost all the grasslands.
- As mentioned in earlier chapters, there are several small grasslands occurring in the critical tiger habitat. However, owing to the rise in the tiger population, there is a need for the creation of more grasslands. Creation of grasslands near water sources and in areas infested with Prosopis juliflora and other weeds in the core area is required. A study shall also be taken up on a priority basis on the changing habitat due to the spread of bamboo at the cost of other species. Managers shall also explore the possibility of converting certain fringes of bamboo patches into grasslands.
- Eradication of weeds in the grassland should be done in a timely manner to improve the grassland habitat. Seedlings of woody species emerge amidst the grassland in a small patch and gradually grow in size and area, thus creating favorable conditions for other woody species. These small colonies of woodland

appear in the grasslands and gradually encroach upon the grassland area, thus reducing the grassland habitats, which are so important for gregarious species like Chital.

- The tendency of encroachment of woodland on grassland should not only be checked but the areas already encroached upon should be cleared by uprooting to maintain the grassland habitat.
- Once the eradication of woody stumps has been done, further maintenance of grasslands shall have to be done by fire management.

i) Protection of Grassland Area:

- Once the eradication of woody stumps has been done, further maintenance of grasslands shall have to be done by fire management
- The existing large areas of grasslands at Pedda Cheruvu, Bairluty, Damarla Kunta, Naramamidi Cheruvu, Nekkanti-Palutla Plains, Gudimetla Penta, Pulladona, Darabailu, Isukagundam, GBM & VP South, Vijayapuri South, etc., account for around 10%–20% of the Critical Tiger Habitat.
- Considering the succession tendency of the grasslands and their gradual degradation due to severe grazing pressure, the Park Management should erect enclosures to prevent invasion by unpalatable species, domestic cattle, and fire.
- Many earlier gaps have been gregariously colonized by woody species, and around 2 ha area should be discontinuously cleared/manipulated in such pockets as a part of habitat management. These pockets have been identified on either side of the Naramamidi Cheruvu–Pedda Cheruvu–Rollapenta Road and Peddarutla–Darabailu, Nekkanti–Palutla Road.
- These open pockets would also serve as effective corridors to facilitate the future dispersal of the increasing ungulate populations. This should be done by identifying and mapping such new clearings and patches invaded/infested by the growth of *Butea monosperma*, *Lagerstroemia parviflora*, *Diospyros melanoxylon*, and other shrub species in Yerragonda Palem, Dornal, Nagulutty, and Srisailam Ranges, and removing them exclusively under the Habitat Improvement Programme.
- While doing this operation, care should be taken to ensure the clearings are small isolated patches.

- Large clearings in a stretch may foster a rapid increase in ungulate population (especially the spotted deer), which would render the entire exercise counterproductive.
- The cleared woody material should be allowed to remain on the forest floor for recycling of nutrients. It is also recommended in this plan to relocate certain villages like Palutla, Nekkanti, Ponnalubailu, Peddacheruvu, etc., from the Critical Tiger Habitat.
- All these areas shall be converted into meadows, as there are no trees in the farmlands or in the encroached lands.

ii) Prescriptions for Bamboo:

- Bamboo (*Dendrocalamus strictus* / *Bambusa arundinacea*) is an important cover type in this tiger habitat, and is a common understorey (especially *Dendrocalamus strictus*). During the young stages or new shoot formation stage, it has tremendous food value for the ungulates.
- Bamboos exhibit the phenomenon of "gregarious" as well as "sporadic" flowering. While no special intervention is normally required in the latter, the former may warrant some site-specific action.
- The bamboo regeneration in gregariously flowered areas hampers the growth of other forage as well as browse species, since the roots of bamboo seedlings are closely matted, thereby preventing the growth of other species.
- In such situations, over a limited area (in irregular patches), spacing may be created to facilitate the growth of other species and also clump formation.
- The dead, fallen bamboo clumps on the forest floor are used by ground-nesting birds, sambar, and chital for shelter.
- The standing growth facilitates perching of birds and arboreal species, apart from having food value.
- No regular working of bamboos shall be allowed. The dead, fallen bamboo clumps on the forest floor foster nutrient cycling in the substratum.

iii) View Lines: -

- It will be taken up as per the requirement along the roads and cart tracks. Kurnool–Dornala, Dornala–Srisailam Highways.

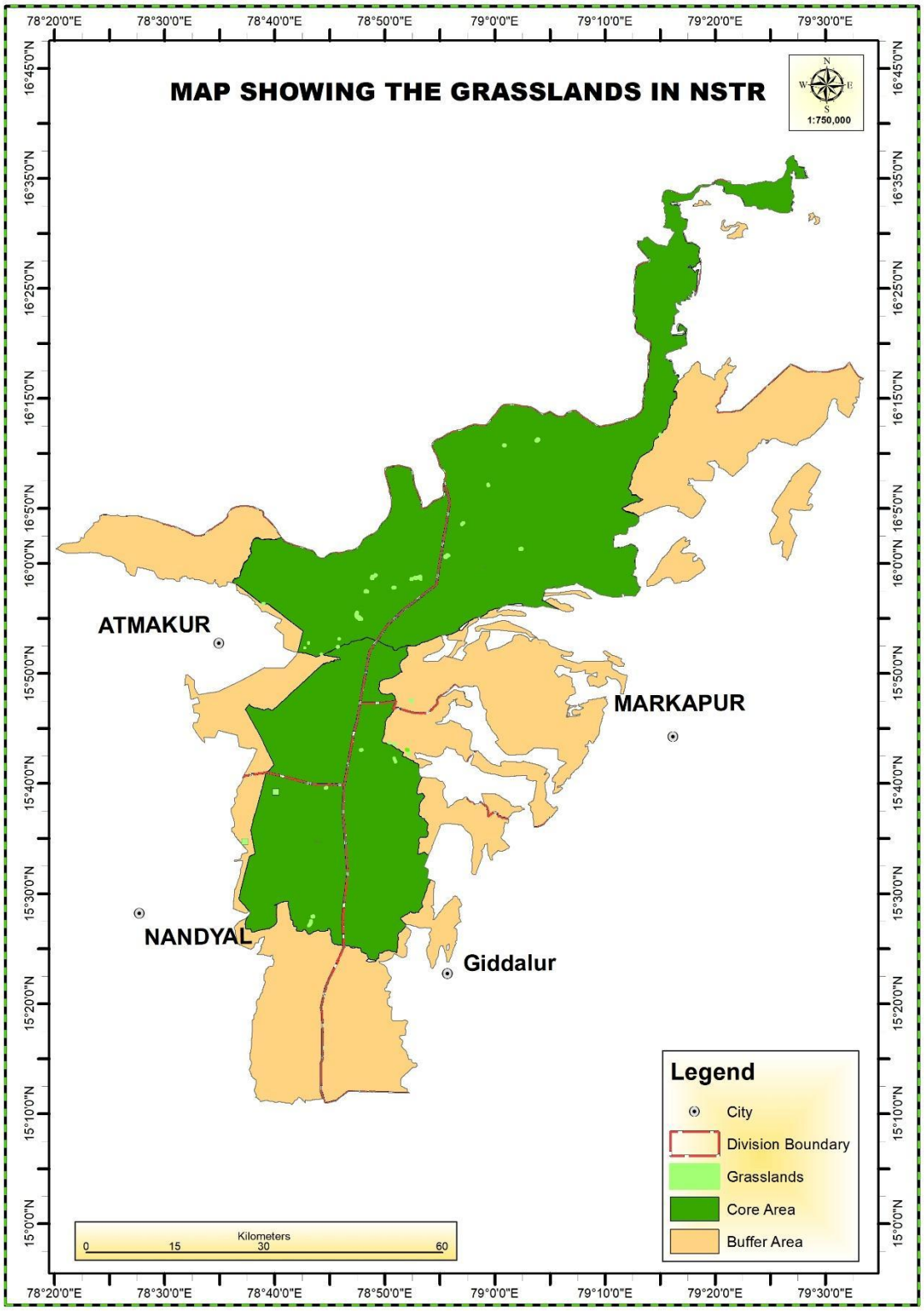
- A 10 m to 20 m width view line will be made on either side of the roads on the aforesaid highways and also forest roads such as Central Nallamala Road passing through Gundla Brahmeswaram Sanctuary, Rollapenta–Pecheruvu–Thummala Bailu Forest Road, Eastern Nallamala Road, and Palutla–Yerragondapalem Road.

iv) Weed removal: -

- The weeds are those plants which grow in the place where they have no utility. In case of grazing lands, weeds are unpalatable plants which are not grazed by animals.

  In a grazing land, the proportion of weeds increases in due course of time. The main weedy species is *Lantana camara*. This is to be uprooted. In fact, there should be a systematic ongoing programme of weed eradication in each grassland after a certain period, say three years or so. The uprooting has to be done during the rainy season by using wooden crowbars and pulling the plants upside down by ropes.
- It is proposed to remove only sporadic lantana weeds; in case of gregarious lantana, it can be maintained as such, as it provides good cover to carnivores, young ones, and seeds to various avian fauna.
- *Phoenix* spp. (*Phoenix robusta*) is spread over more than 25,000 ha of NSTR, which is smothering local grass species, and it is also fast spreading in the core area of NSTR due to frequent forest fires. Wild animals such as bear, sambar, civet, chital, etc., also eat the fruits of *Phoenix*, which is resulting in the spread of *Phoenix* spp. in NSTR. Removal of *Phoenix* spp. may be taken up gradually so that local grass species can be restored.

Map 47: - Map showing Grass Lands in CTH (NSTR)



7.2.2.4. Theme Plan–IV: Safeguards for Wildlife on Highways:

Thousands of vehicles ply every day between Kurnool–Guntur Road, Dornala–Srisailam Road, and Hyderabad–Srisailam Road, especially during the Mahasivarathri and Ugadi festivals. There are no nighttime traffic restrictions on Kurnool–Guntur Road. There have been incidents of many wild animals, such as leopards, sambars, spotted deer, jackals, and civet cats, being run over by fast-moving vehicles. Therefore, there is a need to regulate vehicular traffic during nighttime. Although vehicular traffic during nighttime is restricted on Dornala–Srisailam Road, during the festival seasons of Mahashivaratri and Ugadi, vehicular traffic is temporarily permitted on Dornala–Srisailam Road at night.

Vehicular traffic on the highway passing through the tiger reserve shall be regulated. No vehicles are allowed through the tiger reserve between 9 PM and 6 AM on the Dornala–Srisailam highway. Similarly, night traffic on Kurnool–Guntur Road (NH 340C) from Bairlutty to Dornala shall also be curtailed during night hours, duly studying the impact and following the proper procedure. The impact of vehicular movement on this road is very evident, with frequent road kills of wildlife, some of which are shown below.









Memorandum of Understanding shall be done between the Forest Department, Highway Authorities (R&B and NHAI) & District Administration for the following do's and don't's.

DO's	***DONT's***
• Restrictions during night/evening hours • Vehicle speed limit 30 Km Per Hour • Careful driving to avoid wildlife accidents. • Erection of speed breakers at appropriate places • Vehicles to be allowed in a convoy to allow gap time for animals to cross the roads. • Check Posts to be erected for anti-poaching and anti-smuggling measures in addition to the existing check posts. • Speed regulation technologies like speed guns are to be used. • Violators of the above restrictions to be punished.	• Horn should not be blown unnecessarily inside the Core Area • Vehicle should not be parked inside the Core Area • Passengers should not be allowed to get down from the vehicles for any purpose in the Core Area • Monkeys should not be fed. • No photographs are allowed inside the Core Area • No fire should be lit. • Loud music should not be played inside the Core Area.

Any violations should be penalized as stated below.

Penalty (fine) for the following within NSTR limits and NSTR Seshachalam corridor, duly following the provisions of WL (Protection) Act, 1972 & Amendement from time to time:

a)	For littering	-	Rs. 1000/-
b)	For parking the vehicle in the forests away from the road	-	Rs.500/-
c)	For feeding monkeys	-	Rs. 1000/-
d)	For violating speed limit	-	Rs. 500/-
e)	For smoking and consumption of alcohol	-	Rs. 1000/-

Penalties & fines can be levied on Roads passing through NSTR for breaking various regulations mentioned above as decided by NSTR authorities (Field Director).

Buy Back Mechanism: -

The locals (especially Chenchus) shall be trained to craft cloths / jute / paper bags. The initial cost for establishment of units in different Gudems / Villages shall be borne out

of TCF / CSR and the bags shall be offered to the tourists (1 bag / vehicle) at the cost of Rs.20/-bag and in the next check post, the bag shall be returned by the tourists to get back Rs.10/-.

***Merits*: -**

- ❖ Promoting livelihood of the locals
- ❖ Women empowerment among locals.
- ❖ Clean and green NSTR

The revenue generated out of this concept shall be exclusively used for community development programmes which in turn reduce stress on forests.

7.2.2.5. Theme Plan-V: Reintroduction of wild species including Indian Gaur

Gene diversity, species diversity, and species richness are paramount for achieving a healthy tropical-level interaction in an ecosystem. In NSTR, though the gene and species diversity are good, it has been understood through various historical records that certain species became extinct, and their revival/reintroduction will support the ecosystem to survive in a healthy manner. The reintroduction of Indian Gaur will be taken up based on the feasibility study undertaken by WII, Dehradun, and prior approval of the competent authority.

Re-introduction of Indian Guar *(Bos gaurus)*



Indian Gaur (*Bos gaurus gaurus*) is one of the large wild ungulates of Asian jungles. It is the tallest living ox and one of the four heaviest land mammals (elephant, rhino, and wild buffalo are the other three), weighing up to 940 kilograms (2,070 pounds) and standing between 1.6 and 1.9 meters (5.2 to 6.2 feet) at the shoulder. Gaur were once distributed throughout the forested tracts of India and South Nepal, east to Vietnam

and south to Malaya. Currently, they are distributed in isolated pockets, largely corresponding to the main mountain systems, like the Western Ghats, Central Indian Highlands, and northeastern Himalaya. Apart from this, Gaur is also found in the forests of south Bihar and West Bengal, in the southeastern peninsula, and is confined to just over a hundred Protected Areas in India. Gaur is listed in Schedule 1 of the Indian Wildlife (Protection) Act of 1972, listed in Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and categorized as Vulnerable by the International Union for Conservation of Nature and Natural Resources (IUCN).

7.2.2.5.1. Possible causes for local extinction of Gaur in Nallamala:

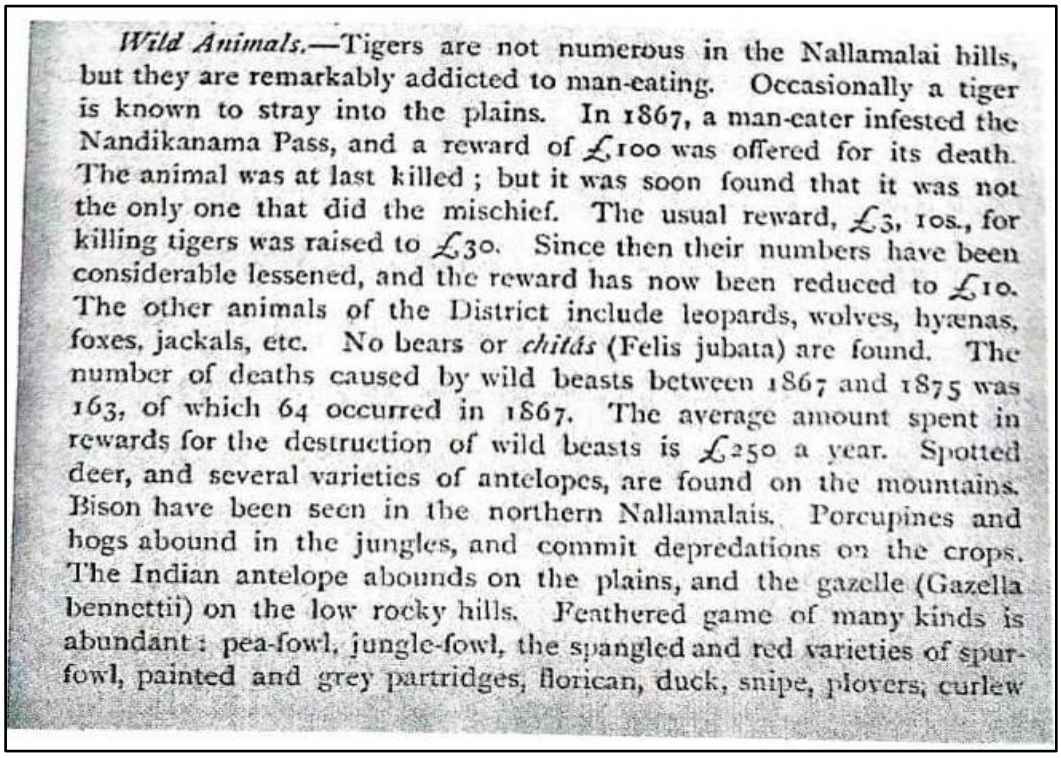
The gaur in Nallamala has become locally extinct for a few decades. There are insufficient records to verify the exact time and reason for its local extinction in Nallamala. However, the reasons for its disappearance could be poaching, diseases, and fragmentation of habitat. Reports suggest that the free-ranging population of gaur has succumbed to epidemics like Foot and Mouth disease, Rinderpest, and Anthrax in many areas of their distribution.

7.2.2.5.2. Evidence of Gaur in Nallamala in the past:

Gaur is known to have moved in the forest tracts of the Eastern Ghats in the past. The following evidences prove that Gaur were present in the Nallamala in the past:

1) There is evidence of the presence of Gaur in the Nallamalas in "***The Imperial Gazetteer of India***" by W.W. Hunter, Volume VIII, Page No. 35, 1886, as preserved in the Research Library of the United States Air Force, Cambridge Research Center, Geophysics, which is furnished below:
2) The other evidence is mentioned in *Fauna of British India, Ceylon and Burma – Mammalia* by W.T. Blanford, F.R.S., published in 1888–91, as northern circars, central provinces, and Hyderabad.
3) Another evidence is that Gaur was sighted in adjoining districts of Karnataka, and recently one bull was sighted in Amrabad Tiger Reserve, erstwhile NSTR. Statements from elderly people also reveal the presence of Indian Gaur in the landscape.

4) In 1867, in the Nandikanuma Pass area of the northern Nallamala hills, the presence of Gaur was reported. During 1916, with livestock diseases, the Gaur population drastically diminished (Dr. Srinivasulu, Osmania University). In the present scenario, there is no evidence of Gaur in the Nallamala hill range. The possible reasons for the disappearance of Gaur in the Nallamala hill ranges might be livestock diseases, habitat disturbance, poaching, and hunting activities.



Wild Animals.—Tigers are not numerous in the Nallamalai hills, but they are remarkably addicted to man-eating. Occasionally a tiger is known to stray into the plains. In 1867, a man-eater infested the Nandikanama Pass, and a reward of £100 was offered for its death. The animal was at last killed; but it was soon found that it was not the only one that did the mischief. The usual reward, £3, 10s., for killing tigers was raised to £30. Since then their numbers have been considerable lessened, and the reward has now been reduced to £10. The other animals of the District include leopards, wolves, hyænas, foxes, jackals, etc. No bears or *chitás* (Felis jubata) are found. The number of deaths caused by wild beasts between 1867 and 1875 was 163, of which 64 occurred in 1867. The average amount spent in rewards for the destruction of wild beasts is £250 a year. Spotted deer, and several varieties of antelopes, are found on the mountains. Bison have been seen in the northern Nallamalais. Porcupines and hogs abound in the jungles, and commit depredations on the crops. The Indian antelope abounds on the plains, and the gazelle (Gazella bennettii) on the low rocky hills. Feathered game of many kinds is abundant: pea-fowl, jungle-fowl, the spangled and red varieties of spur-fowl, painted and grey partridges, florican, duck, snipe, plovers, curlew

not absolutely, the northern boundary of its range. It does not inhabit the grass-jungles of the Gangetic plain, except close to the Himalayas; but it is found in the forests at the foot of those mountains as far west as Nepal. South of the Ganges it exists in suitable tracts in Chutia Nágpur, Orissa, and the northern Circars, the Central Provinces, Hyderabad territories, Mysore, and throughout the Western Ghâts, wherever it has not been exterminated or driven away.

Habits. Excellent accounts are given by Elliot (*l. c.*), Forsyth ('Highlands of Central India'), Sterndale (Nat. Hist. Indian Mam. and 'Seonee'), Hornaday ('Two Years in the Jungle'), J. D. Inverarity (Jour. Bombay N. H. Soc. iv, p. 294), and above all by Sanderson ('Thirteen Years &c.'). Hodgson's description is evidently from native reports and is untrustworthy; whilst Col. Campbell's delightful stories in 'The Old Forest Ranger,' though quoted with approval by many writers, must, I fear, be regarded as works of imagination.

The gaur keeps to forest or high grass, generally but not always near hills, and is found in herds of from five or six to about 20, or occasionally more. Bulls often wander by themselves, and the finest and oldest bulls are said always to occur solitary; still very large bulls are found with herds, and young bulls are frequently seen alone, or two or three together. All are shy and avoid cultivated tracts as a rule, though instances occur in wild parts of the country of gaur feeding on growing crops. Their food consists chiefly of grasses; they do not commonly browse, though they occasionally eat the leaves and even the bark of particular trees, and they are fond of the shoots of bamboos. They feed generally in the early morning and evening, and lie down to rest from about 9 A.M. to about 4 P.M., and at night. They drink as a rule in the afternoon.

These bovines inhabit the hills of the Indian Peninsula to an elevation of 5000 or 6000 feet, or occasionally even higher; but they do not ascend the Himalayas to nearly the same extent. They are admirable climbers, and ascend or descend steep hills with wonderful facility. They are timid animals, but in wild places, where they are rarely subject to attack and disturbance, they are by no means remarkably wary. Wounded animals occasionally charge, and solitary bulls have been known to attack without provocation; but the tales of the gaur's ferocity recorded by some sportsmen are not confirmed by any of the later writers who have had good opportunities of studying the animals. A bull gaur is one of the noblest animals in the world, a model of strength and symmetry, and his formidable appearance has led to his being unjustly credited with a savage disposition.

The period of gestation is not known with any certainty. Breeding is said to take place in the cold season. The calves are mostly born (in the Peninsula of India) in August or September, a few early in April, May, or June. Gaur suffer from the same diseases as domestic cattle.

7.2.2.5.3. Importance of Megaherbivores (Gaur) in the Nallamala Ecosystem:

The only megaherbivore historically present in the Nallamala ecosystem was the Indian bison, or Gaur. Megaherbivores like the Gaur perform many ecological functions and influence the plant community like landscape architects. They change the structure of the vegetation through their feeding behaviour and destructive power. The Gaur plays an important role in the moist and deciduous forests of India, having a major impact on the physical structure of habitats, rates of ecosystem processes, and the diversity of communities. These actions help maintain grasslands by controlling natural succession (removal of bushy growth, weeds, etc.) and opening up dense thickets. This makes food availability and conditions more conducive for other herbivores, positively impacting the prey base availability for all carnivores. Due to the fact that the Gaur grazes on a large number of grass species, also browses on large plants, and feeds on fruits, it plays a major role in the dispersal of many species. The absence of megaherbivores in the current Nallamala landscape may be a major factor in the low prey densities in Nagarjunasagar-Srisailam Tiger Reserve. The reintroduction of the Gaur into the Nallamala ecosystem will have a positive impact and may serve as a prey species for tigers.

7.2.2.5.4. Aim & objectives of Re-introduction:-

The principal aim of reintroduction of Gaur in Nallamala is to establish a viable, free ranging population in the wild which has become locally extinct in its farmer natural habitat and range and requires minimal long-term management.

Objectives: The aim of reintroduction of Gaur in NSTR is to:-

- Enhance the long-term survival of Gaur in Eastern Ghats.
- Re-establish a keystone species in ecological & cultural sense in Nallamala ecosystem.
- Maintain and restore natural biodiversity of NSTR.
- Enhance the prey availability for sustaining and enhancing the Tiger population in NSTR.

7.2.2.5.5: Justification for Re-introduction:

- The Nallamala hill ranges, and especially the Gundlabrahmeswaram Wildlife Sanctuary, are rich in biodiversity and can still support the Gaur population. To enhance the long-term survival of Gaur, whose existence has become threatened or endangered in the wild, this reintroduction will help return the native species to localities where they had been extirpated. The reintroduction of Gaur will fulfill a biodiversity restoration objective in the Sanctuary.
- Dr. AJT John Singh, a renowned wildlife biologist, has suggested the reintroduction of Gaur in GBM during his visit to GBM Wildlife Sanctuary.
- There is no dearth of plant species, and fodder suitable for the Indian Gaur is plentiful in the GBM Wildlife Sanctuary.
- Restoring a mega herbivore like Gaur would provide an ideal prey species for sustaining the tiger population in NSTR.
- The known extinction of Gaur from three protected areas in India (Thattakad Wildlife Sanctuary, Bandhavgarh Tiger Reserve, and Kanger Valley National Park) in the last two decades highlights the plight of this species and the urgent need for measures to stem further losses. The reintroduction of Indian Gaur was a success in Bandhavgarh Tiger Reserve. This reintroduction enhances long-term survival, as the NSTR landscape is vast, connecting the Seshachalam landscape with an area of more than 10,000 sq. km.
- Once the habitat is suitable, the species may flourish once again. For example, in Valmiki Tiger Reserve, the Gaur population had been extirpated and migrated to the Nepal area; they have returned and are now breeding well after the improvement of grasslands and habitat in the Reserve.

7.2.2.5.6. Brief note on GundlaBrahmeshwaram Wildlife Sanctuary (GBM):

GBM Wildlife Sanctuary was notified as an extended core of NSTR vide G.O. Ms. No. 50, EFS&T (For-II) Dept, dt. 18.03.2010. This sanctuary is tucked between two important hill passes, *'Manthrala Kanuma*' and '*Nandi Kanuma*,' in the Central Nallamala Hill Ranges. The area of GBM Sanctuary is 1194 sq. km. The terrain is undulating with plateaus, ridges, deep valleys, and gorges, which support tropical

moist and dry deciduous forests with an undergrowth of bamboo and grasses. The sanctuary is spread between 15°-40' – 15°-89' Latitude and 78°-61' – 78°-9' Longitude. GBM has numerous streams, small and big, flowing over the entire reserve, most of which ultimately join the river Krishna. Some of these streams are dry throughout the year, except for a few months during the rainy season (July–November). The rivers Gundlakamma, Paleru, and Manneru are seasonal only. The Gundlakamma River rises in the heart of the GBM Sanctuary, and the Cumbum tank is formed by a bund across this river in the plains.

The vegetative resources of GBM are mostly moist deciduous, generally of miscellaneous type. The most common species occurring are *Anogeissus latifolia, Terminalia tomentosa, Pterocarpus marsupium, Hardwickia binata, Chloroxylon swietenia, Lannea grandis, Boswellia serrata, Dalbergia paniculata, Zizyphus xylopyra, Lagerstroemia parviflora, Terminalia arjuna*, etc. The ground flora consists of grasses, which are now subjected to the annual fires in the dry season. The grass species occurring are *Apluda mutica* (golugulu), *Aristida hystrix* (Cheepirigaddi), *Heteropogon contortus* (Bandedu gaddi or Spear grass), *Cymbopogon coloratus* (Boda gaddi), *Themeda*, *Andropogon foveolatus* (tuft grass), and *Sehima nervosum* (Nendragaddi). The old trees commonly found are Ficus, Terminalia, Hardwickia, Bombax, Tamarindus, Syzygium, Pterocarpus, Dillenia, and Albizia species.

The faunal elements found in GBM are the Tiger, Leopard, Sloth Bear, Wild Dog, Ratel, Porcupine, Giant Squirrel, Four-Horned Antelope, Sambar, Spotted Deer, etc., and a diverse avifauna as well.

7.2.2.5.7. Release site:

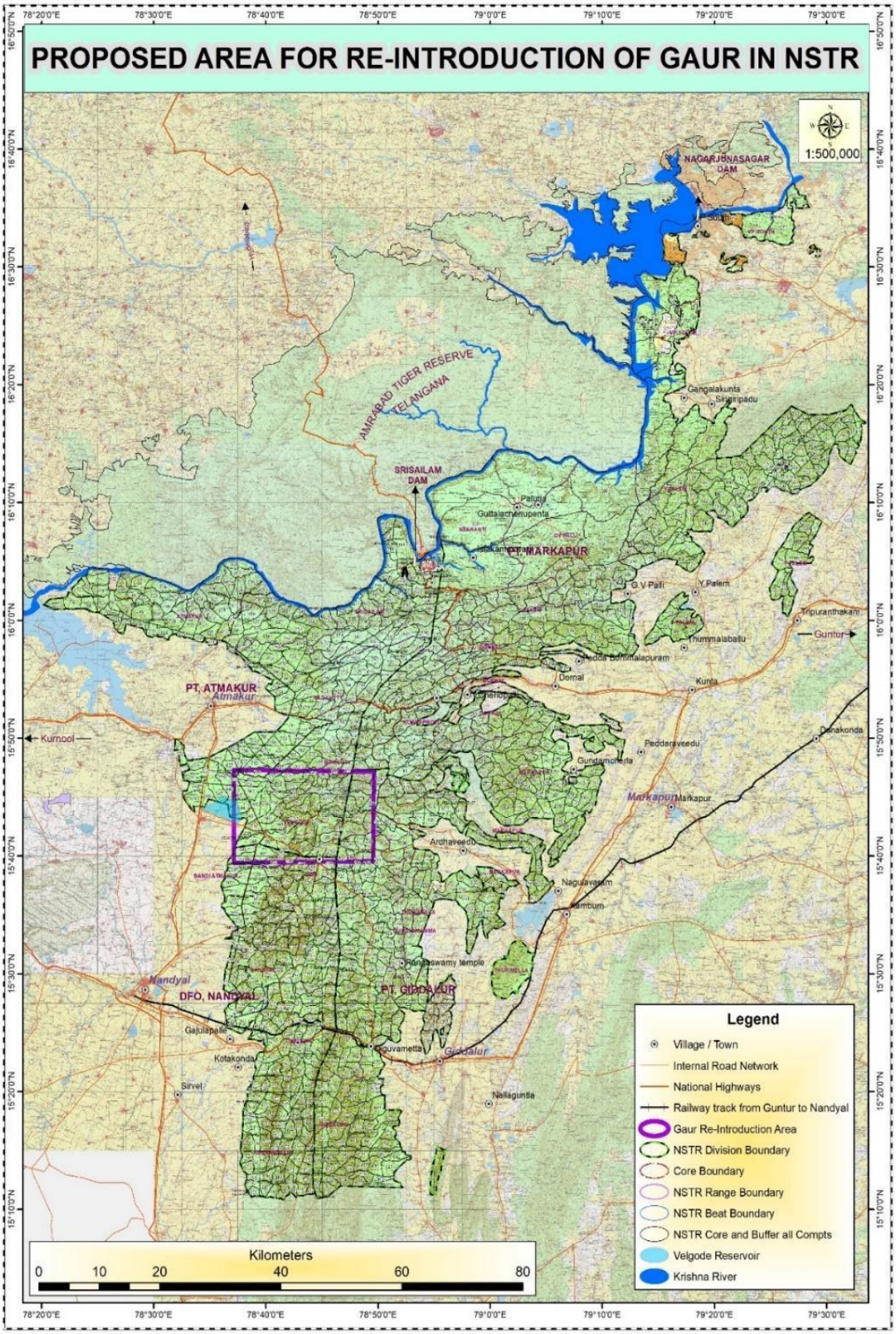
The release sites in NSTR would be identified after conducting pre-feasibility studies as per IUCN guidelines. The range, compartments, and soft release sites would be identified in consultation with wildlife experts. The preliminary assessment has been done for the habitat requirements of the Indian Gaur. Indian Gaur prefers grasslands and moderately sloped high forests and feeds on a variety of species, which are abundant in the Nagarjunasagar Srisailam Tiger Reserve. The requirement for water needs to be assessed, as large water bodies are not available in the middle of forests, particularly in Gundlabrahmeswarm Wildlife Sanctuary.

Considering the facts and requirements of the Indian Gaur, which migrates over a distance of 12–15 km, the forests of Gundlabrahmeswarm temple area, located 14–16 km away from Velgode Balancing Reservoir, have been selected. The GBM Range of Project Tiger Division, Nandyal, is chosen as the enclosure site for the soft release of Gaur, and the Gaur reintroduction project DPR has been submitted. This locality is marked on the map of the Tiger Reserve and may be one of the options for selecting release sites in the landscape.

Although water is available in the Krishna River, transporting Gaur may be very difficult. Moreover, the fodder requirements of the Indian Gaur are suitable in and around the Gundlabrahmeswarm temple area. The area abutting the Velgode Reservoir from Gundla Brahmeswaram falls within 90 compartments, covering approximately 320 sq. km. The area is marked on the map shown below. The compartments are 604–609, 627–628, 639–646, 657–695, 712–713, 716–731, 735–744, 802, and 827–835.

The overall individual male home ranges vary from 135 to 142 sq. km, and the overall individual female home ranges vary from 32 to 169 sq. km. Considering the home range of Indian Gaur in summer, monsoon, and winter is 290, 137.1, and 155 sq. km respectively, the present or other areas may be proposed after the feasibility study of reintroduction of Indian Gaur by WII and the AP Forest Department.

Map-48: Map showing the proposed area for the reintroduction of Gaur



7.2.2.5.8. Legal Requirements:

As Gaur is included in Schedule I of the Wildlife Protection Act, 1972, permission from the Government of India is required for undertaking capture operations (Sec. 12). As there is likely to be some mortality during the operations, GOI permission must be obtained for capturing and transportation in advance, along with approval from the NTCA under Section 38O(1)(f) of the Wildlife Protection Act, 1972.

7.2.2.5.9 Present Status of the Re-introduction:

On the recommendation and preliminary study by the Field Director, Nagarjunasagar Srisailam Tiger Reserve the Prl.CCF / Chief Wildlife Warden of the State of Andhra Pradesh addressed a letter to National Tiger Conservation Authority for the feasibility study of re-introduction as per the guidelines of IUCN. A Pilot study on the feasibility of Gaur Re-introduction in NSTR, Andhra Pradesh is being undertaken by WII during 2024.

The details shared to the Wildlife Institute of India regarding the re-introduction of Indian Gaur is place below.

IUCN Guidelines for Re-introduction: The IUCN/SSC guidelines define "Reintroduction" as an attempt to establish a species in an area which was once part of its historical range, but from which it has been extirpated or become extinct The IUCN guidelines stipulated that reintroduction requires a Multidisciplinary approach involving a team of persons drawn from a variety of backgrounds Government personnel, Non-Government organizations, funding bodies, Universities, Veterinary institutions, Zoos with a full range of suitable expertise. The team leaders should be responsible for co-ordination between the various bodies and provision should be made for publicity and public education about the reintroduction programme. As per the IUCN / SCC guidelines the pre-project and post-release activities would be taken up.

Process/Steps: The reintroduction planning process shall involve the following steps:

1. Around 20-50 individuals of Gaur to be proposed for capture through chemical immobilization from the Papikonda National Park and other parts of Eastern Ghats of Andhra Pradesh. In addition, wild population of Eastern Ghats of Telangana state, Central India and Western Ghats shall also be explored for Reintroduction.

2. Holding these captured animals in loading and recovery pen for one or two days.
3. Transportation to NSTR in appropriate vehicles designed for the purpose.
4. Holding in small pen of 2-3 Ha. made within the larger enclosure for observation and treatment.
5. Soft release into a large enclosure of 20-100 Ha. for approximately two to three months for acclimatization and social bonding.
6. Final release in the NSTR.
7. Monitoring.
8. Chemical capture, holding, transport, soft release and monitoring to be done involving wildlife experts, experienced Veterinary team and involving institutions like Wildlife Institute of India.

Source Population: Around 20-50 individuals of Gaur to be proposed for capture through chemical immobilization from the Papikonda National Park and other parts of Eastern Ghats of Andhra Pradesh. In addition, wild population of Eastern Ghats of Telangana state, Central India and Western Ghats shall also be explored for Reintroduction. NTCA technical committee has given a very categorical suggestions for reintroduction of Gaur.

Herd Size for Re-introduction: Gaur is gregarious in habit and group structure is fluid. A typical group consists of cows and a few calves, one or two adult bulls and sub-adults. Older males are generally solitary joining the group only during rut. Bulls occasionally form bachelor groups. The group size ranges from 1 to 16 animals and may occasionally goes upto 40. The adult sex ratio of free ranging Gaur in India shows preponderance towards females i.e 80:100 in Kanha, 45:100 in Parambikulam, 47:100 in Tadoba. Hence, it is proposed that initially a herd of 10-15 cows and 5-8 bulls aged between 3-5 years to be reintroduced in a phased manner. GBM Range of Project Tiger Division, Nandyal is selected for enclosure site for soft release of Gaur and Gaur re introduction project DPR is submitted.

Capture Methodology: For Chemical immobilization, the mixture of Ketamine and Xylazine is usually the drug of choice for most carnivores and herbivores in India. In African countries, Etorphine is used for chemical immobilization. Maintenance of sternal recumbency is the most critical aspect of gaur immobilization. Suitable advice from the Veterinary experts would be made for this project, along with details of dosage and antidotes. A detailed veterinary protocol would be prepared for the entire

exercise of capture, transportation, and recovery of gaurs. As there is less expertise in the transportation of large mammals in India, a suitable agency has to be identified for assisting in the capture and transportation of Gaur to GBM wildlife sanctuary. The Madhya Pradesh Forest Department has involved WII.

Recovery and Transportation: A recovery and loading pen would be made available to get the gaur after immobilization and after full recovery the animals would be transported in rescue vehicles/ trucks to their destination escorted by departmental staff and Veterinary doctors. Care to be taken to transport the animals with minimum stress and taking all precautions to avoid any injuries to the animals.

Monitoring: Monitoring would be done to understand the movements of Gaur in the reintroduced area, their home range, population structure and food habits. Few Radio collars may be procured through WII to monitor them for a minimum period of three years.

Project cost: The broad project cost estimates would be worked out for developing infrastructure like holding pen, enclosure for soft release, cost of equipments, drugs, radio collars, hiring man power, expertise and other costs involving capture, transportation and monitoring. Technical and Financial collaboration: As described earlier the technical expertise in capture, handling and transport of large mammals like Gaur in India is less. A suitable agency has to be identified for suggestions and technical guidance. Also, the cost of the project may be expensive and would be difficult for the Government to bear. Hence, donations from reputed organizations to be explored for sharing the expenditure after getting approval from the Government.

Project Duration: The duration of the project may be around 3-5 years including monitoring period.

Terms of Reference (ToR): In order to take up the re-introduction of Gaur in NSTR, a five-member committee represented by experts from different fields of Wildlife management has to be set up with following TOR:

- To contribute in the decision-making process for Gaur reintroduction in NSTR duly assessing the feasibility of the reintroduction programme.
- To assist in identification of possible founder / source population for reintroduction from wild population preferably of Eastern Ghats population.
- To suggest on the assistance and role of various agencies like NGOs, Govt. departments and various institutions for reintroduction of Gaur in NSTR.

- To suggest methodologies and action plans for reintroduction of Gaur in NSTR including risk, uncertainties and mitigation plans along with costs and time frame.
- Suggest agencies who can be involved in planning, capturing/immobilization, handling, translocation, monitoring of large mammals like Gaur for the reintroduction of Gaur in NSTR.
- To suggest on the criteria for technical and financial collaboration for implementing the project of reintroduction of Gaur in NSTR.
- The committee has to submit report within three months from the date of its constitution.

Re-introduction of other wild species:

There are historical evidences for the presence of Striped Hyena and King Cobra, Wolf was also cited recently in Camera Trap image in Atmakur Range of Project Tiger, Atmakur in Nallamala terrain especially in NSTR. However, these species are not sighted in recent times. There is a need for elaborate study on the habitat and presence of these species and revival / reintroduction programme shall be planned accordingly.

7.2.2.6. Theme Plan – VI: In-situ Rewilding enclosure and capacity building:

It is a known fact that Nagarjunasagar Srisailam Tiger Reserve (NSTR) is the largest reserve in India with an area of more than 5400 sq km. Currently, it is home for minimum 80 Tigers in the wild as per Phase-IV monitoring results, 2023. As Tiger is the apex predator in Nallamala biome, the conservation of Tiger habitat has been given highest priority. Due to constant efforts by NSTR Team, there is a remarkable recovery of the Tiger population from a meagre to eighty (at present) in the wild.

In recent times, it is ascertained that some tigers are venturing into revenue villages/enclosures inside forests, for the want of prey (Cattle) and water. And in this regard, necessary action is being initiated for habitat improvement.

However, there are instances where tigers/tiger cubs are rescued due to several reasons, such as abandonment, injury, or being orphaned, for which an in-situ enclosure is inevitable

i) Site conditions & Specifications:

The animal enclosure is proposed to be constructed at Peddapenta in Compt.Nos. 9,10 & 12 of Chinna Manthanala Beat, Korraprolu Range.

ii) Conditions of the Site:

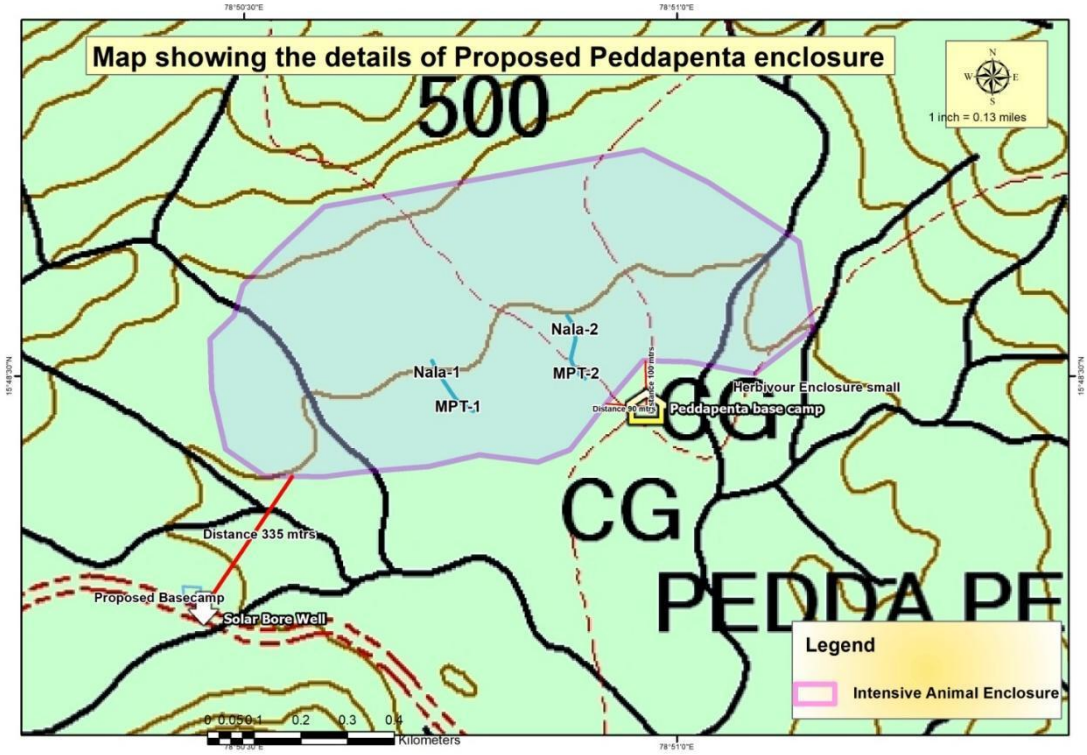
a) The site is characterized by an almost even and less undulating plain surface with in more than 80 hectares of quality grasslands flanked by the hills on 3 sides.

b) The proposed site is rich in moisture content and needs soil & moisture conservation activities to achieve water retention on saturation mode.

c) The site is dominated by clayey and loamy soils rich in minerals which is evident with the tall trees and good girth.

d) The soil profile in the specified site is good with the depth of more than 3 feet.

Map 49: Topography Map of proposed enclosure



iii) <u>Specifications of the site:</u>

a) The identified site has quality grasslands with scattered trees providing scrap land topography.

b) The elevation of the site is around 500 m from mean sea level.

c) More than 7 species of grass have been identified in the said location and dominated by *Heteropogon contortus* (Edu mulla gaddi).

d) The major tree species in the proposed site are <u>*Terminalia tomentosa and Hardwickia*</u> binata in scattered form. However, all along the streams, tree cover is dense.

e) Many small streams are crisscrossing the said site with considerable moisture content. However, it may dry up during peak summer season for which, solar pumps need to be installed at vantage points as a back-up.

iv) <u>Road connectivity and accessibility:</u>

The proposed site is around 16km from Kurnool-Guntur Road, and around 64 km from Diguvametta in Giddalur – Nandyal Road.

<u>Routes:</u>

i) Kurnool – Guntur Highway

Route-1: Nallaguntla - Chinna Manthanala base camp – Peddapenta (12 Km)
Route-2: Ettipaya rasta (Rollapenta) - Chinna Manthanala Basecamp – Peddapenta (12 km)

ii) Giddalur – Nandyal Highway

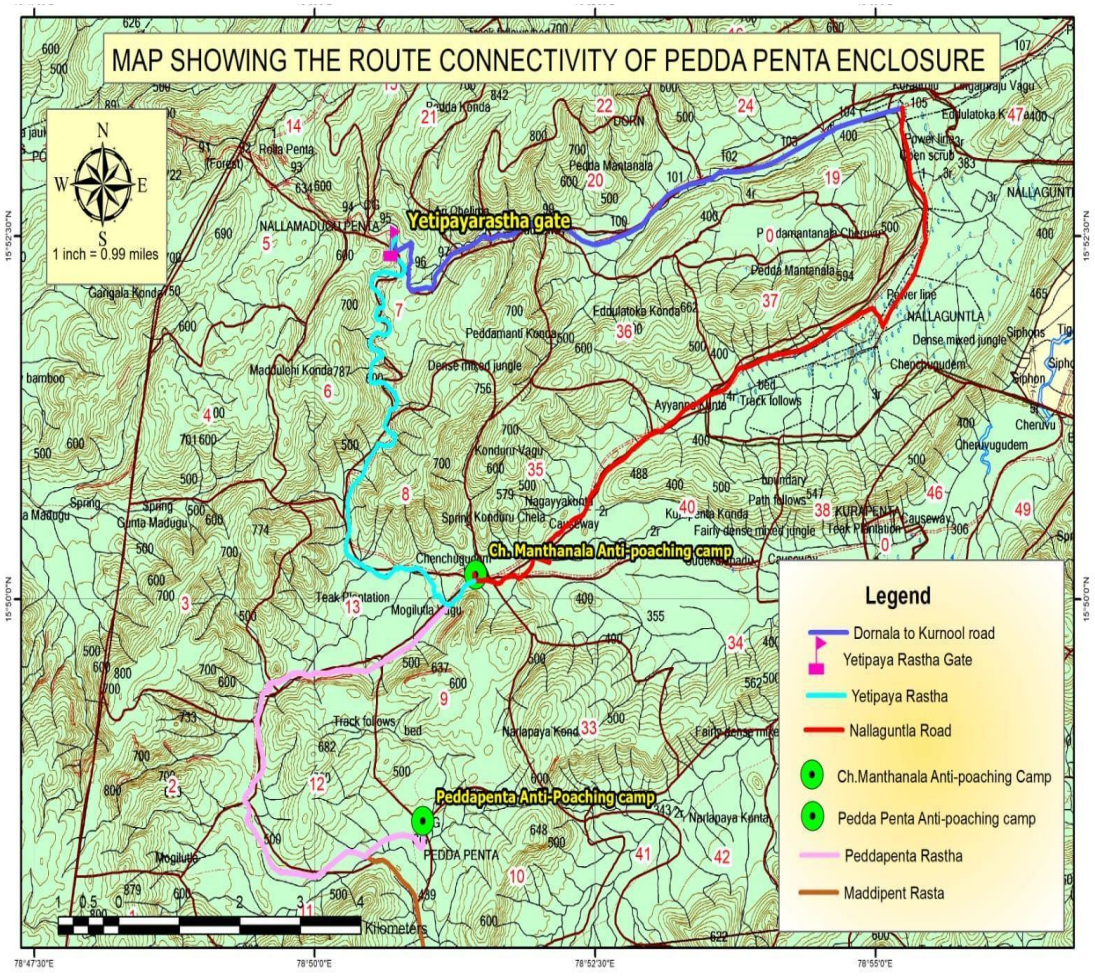
Route – 3: Diguvametta (PT, Giddalur) – GBM – Maddipenta – Peddapenta (64 km)

iii) Atmakur – Velgode Road

Route – 4: Velgode Reservoir – GBM Border – Maddipenta – Peddapenta (60 km)

All the aforesaid routes are motorable with 4 wheeled vehicles. However, the proposed site is easily accessible from Kurnool – Guntur highway.

Map 50: Showing the Route Connectivity of Pedda Penta Enclosure



v) Remoteness:

The proposed location is strategically located wherein the three sides are flanked by hills and only one route i.e. via Chinna Manthanala Base Camp is available and the location is more than 16 km away from the nearest settlement / habitation (i.e.) Nallaguntla and Ayyannakunta.

vi) Protection:

The hills flanking the location acts as a natural barrier, i.e. protection wall against disturbance. Moreover, two base camps namely Chinna Manthanala and Peddapenta base camps with 5 Protection Watchers each are patrolling on daily basis in and around the proposed site.

vii) Water resources in the proposed enclosure:

Seasonal water bodies:

- Yalagamanu kunta
- Chintamanu kunta

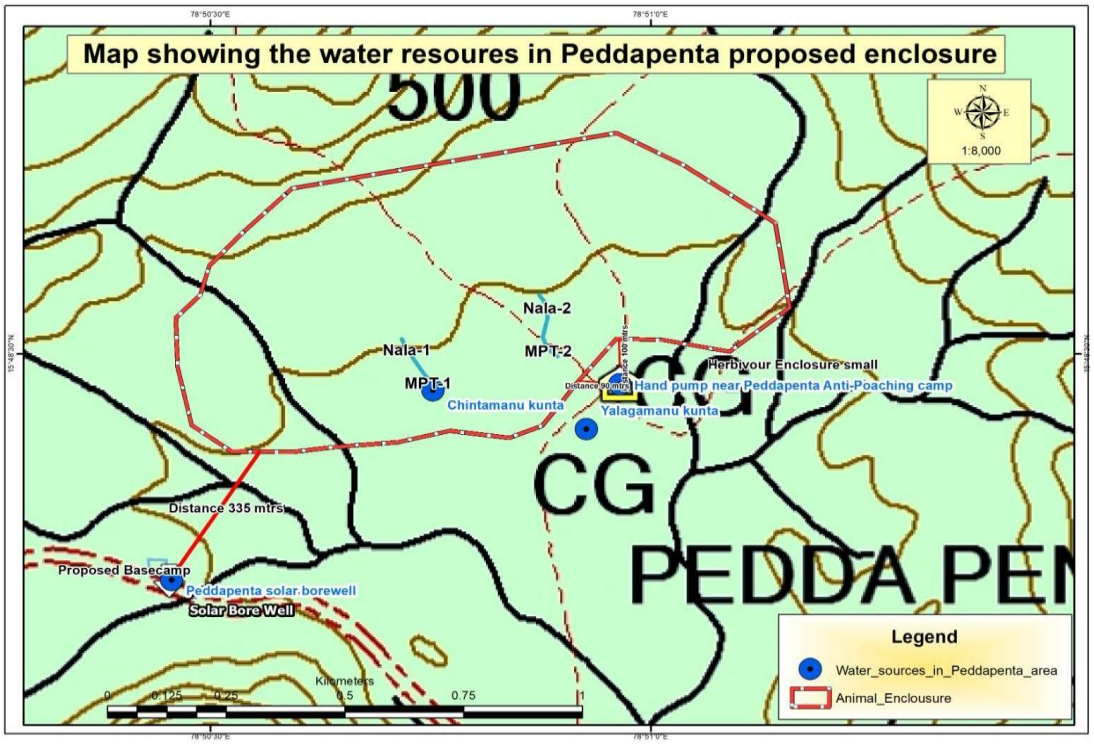
The aforesaid water bodies are good source of water during monsoon season and may dry up during winter and summer seasons.

Artificial water bodies:

- Peddapenta solar borewell
- Hand pump near Peddapenta Anti-Poaching camp

The water yield from the borewells is considerably good and they can sustain all throughout the year with good yield of water even during peak summer season.

Map 51: Showing the Water Resources in Peddapenta Proposed Enclosure

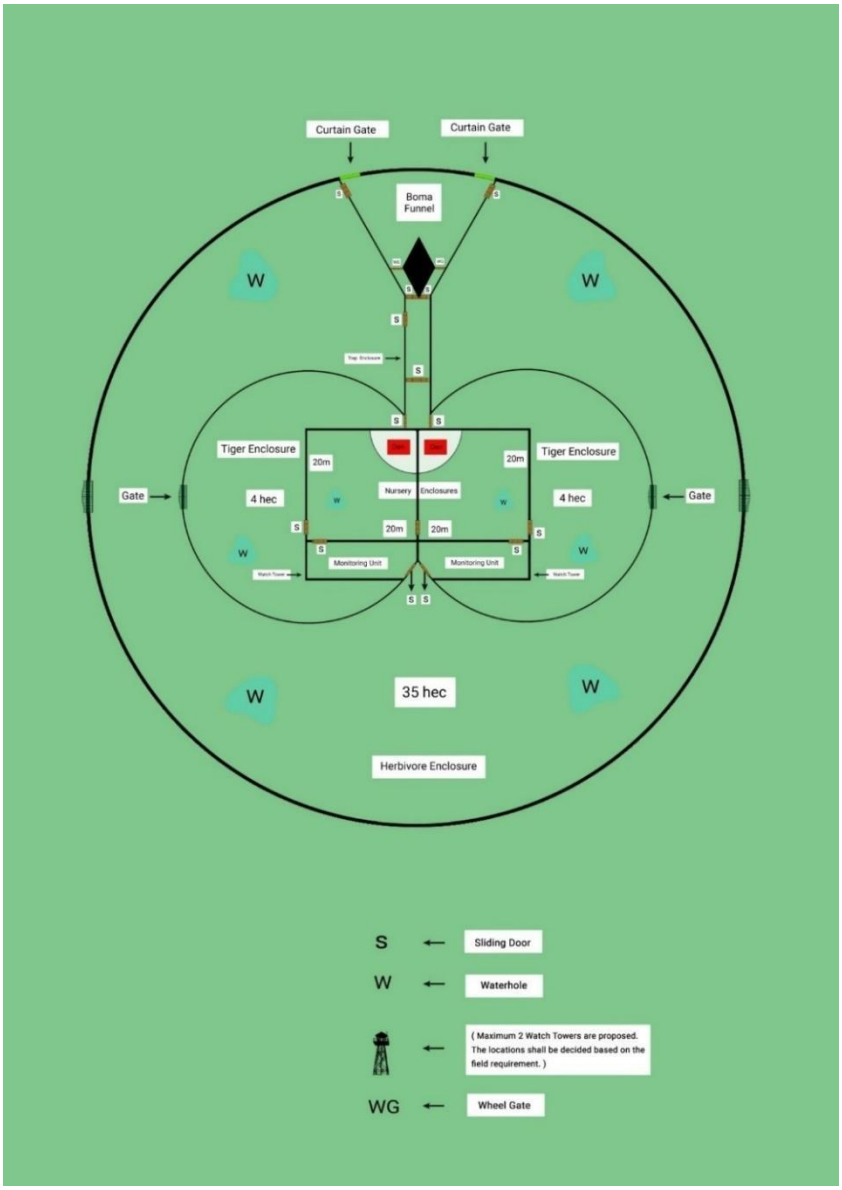


viii) <u>Factors considered for selection of the aforesaid site:</u>

(In tune with Standard Operating Procedure for Tiger re-wilding

- Abundance of moisture and water
- Availability of quality grasslands
- Disturbance tolerance - Distance from the nearest settlement and human foot print frequency.
- Accessibility - Road network and all-weather Road
- Protection - Existing man power and surveillance
- Infrastructure – Existing infrastructure

Proposed Design:



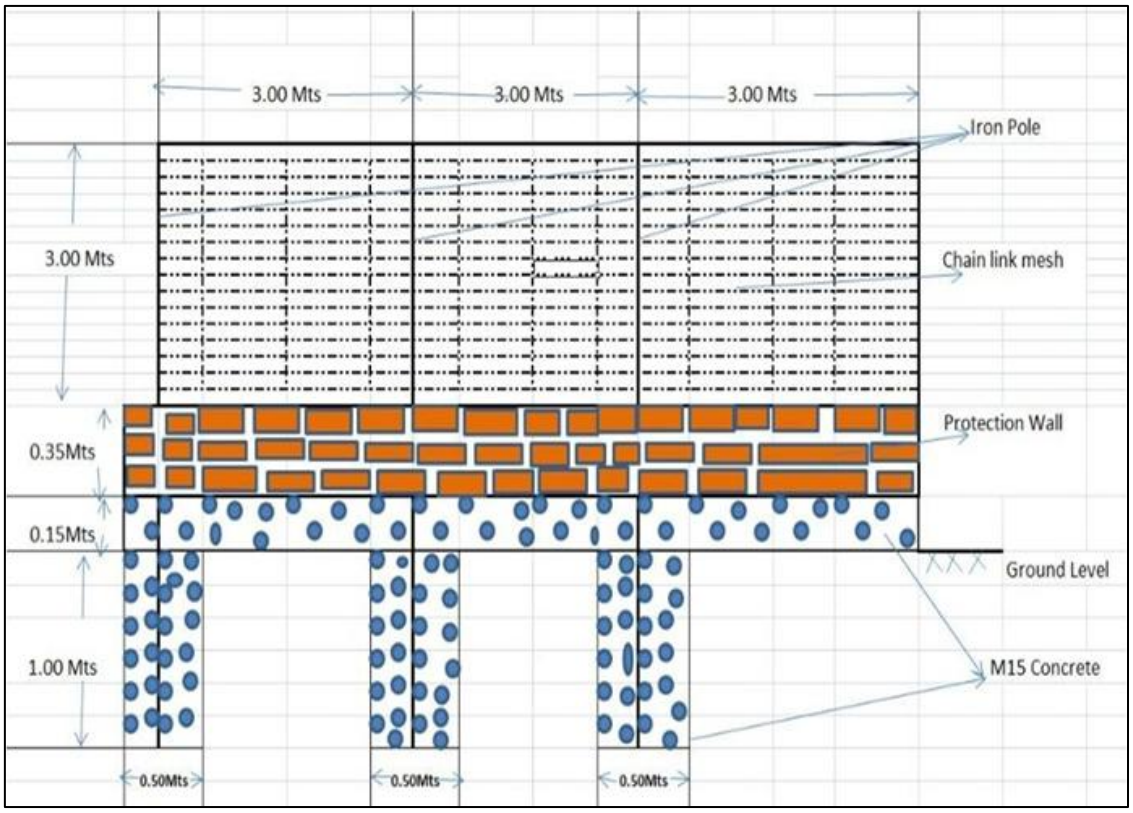
ix)Schematic plan of proposed re-wilding enclosure:

Proposed works and specifications: -

- **Nursery Enclosure: -**
  - Dimensions – 20 mt x 20 mt (2 Nos)
  - Cost – Rs. 10.00 lakhs per unit
- **Monitoring Unit**
  - Dimensions – 5 mt x 40 mt (1 No)
  - Cost – Rs. 5.00 lakhs per unit

- **Specifications**
  - Pole to Pole distance – 3 mt
  - Height of the pole - 3 mt
  - Footing Depth (from the ground level) – 1 mt
  - Ground level protection wall (local stone RR masonry) - 0.35 mt (H)
  - Bed concrete – 0.15 mt (D) Chain link around the fence – 3 mt (H)
  - Chain link carnivore proof roof – 20 mt x 20 mt - 2 Nos.
  - Green mesh around the fence and roof top – 3 mt (H)

Cross section of Nursery Enclosure above and below the ground level



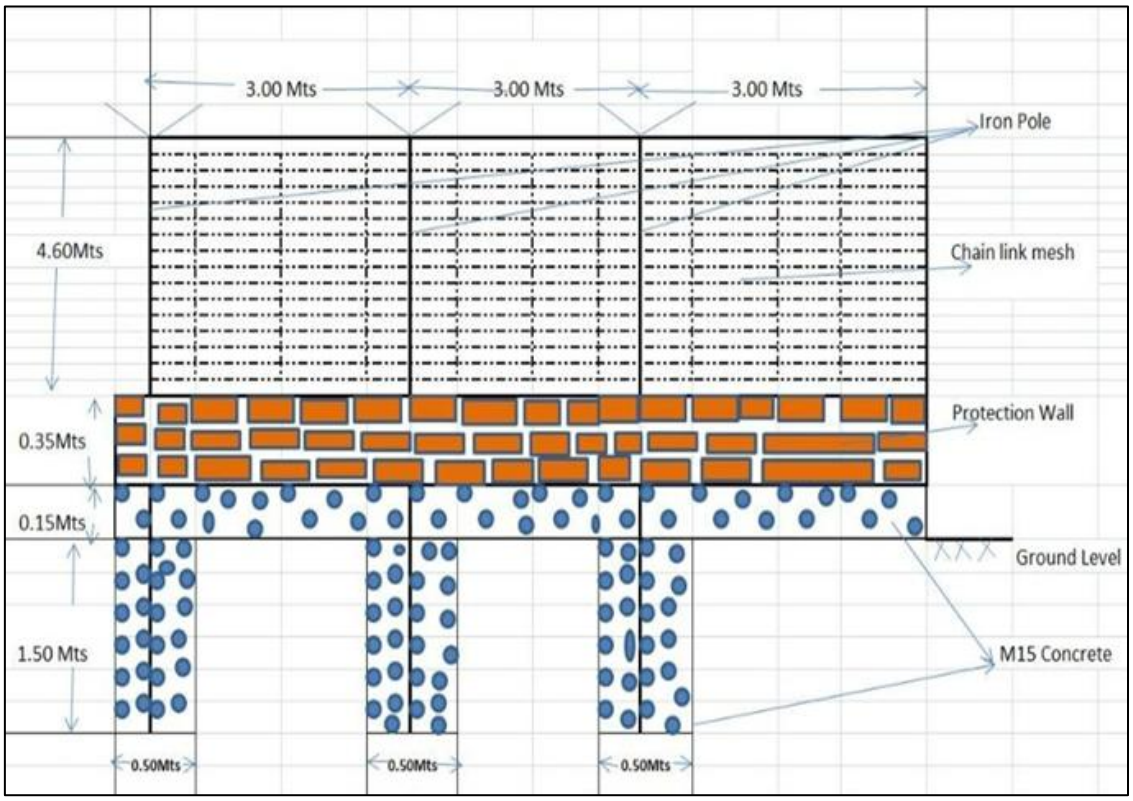
- **Tiger Enclosure:**
  - Area – 4 ha (2 Nos)
  - Dimension - Circumference 710 mt per unit
  - Cost – Rs. 50.00 lakhs per unit

Specifications

- Pole to Pole distance – 3 mt
- Height of the pole - 4.60 mt
- Footing Depth (from the ground level) – 1.5 mt

- Ground level protection wall (local stone RR masonry) - 0.35 mt (H), Bed concrete – 0.15 mt (D)
- Chain link around the fence – 4.6 mt (H), 710 Rmt.
- Green mesh around the fence – 2 mt (H).
- V-shaped pole top galvanized steel barbed wire - 710 Rmt.

Cross section of Tiger Enclosure above and below the ground level



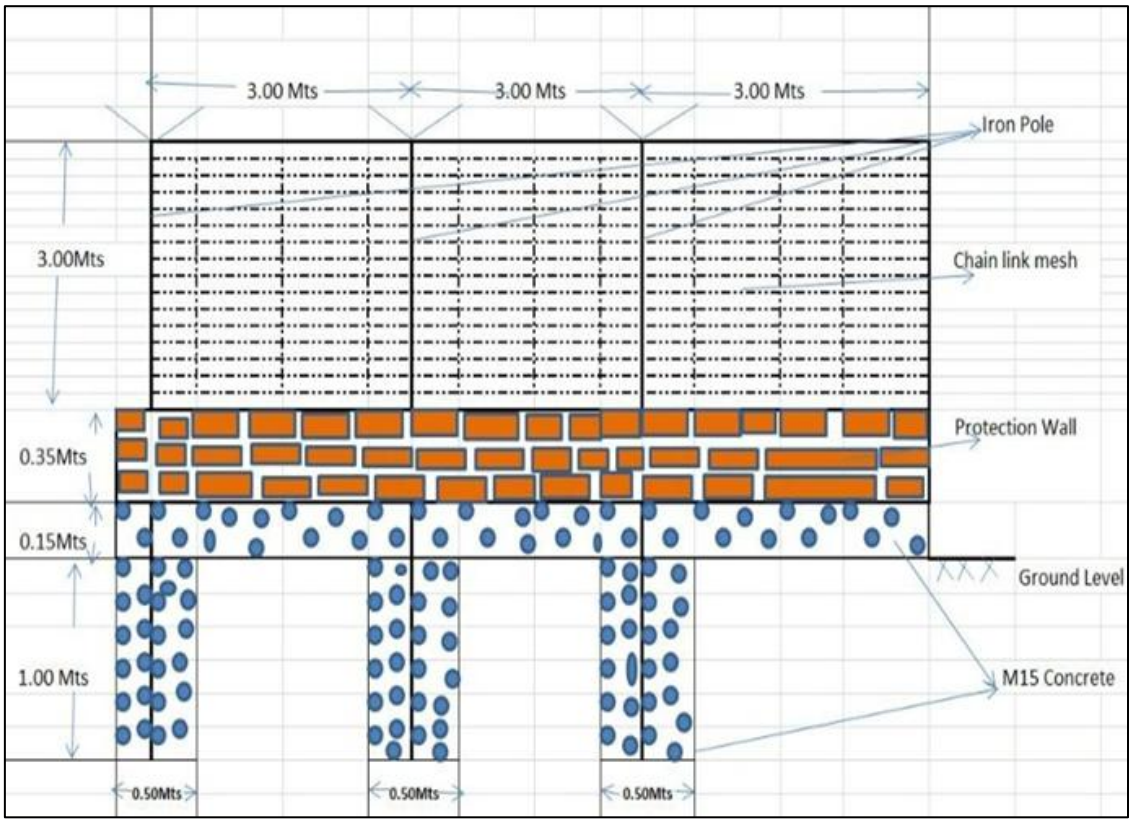
➢ **Herbivore Enclosure:**

- Area – 35 ha (1 No)
- Dimension - circumference 2300 Rmt per unit
- Cost – Rs. 90.00 lakhs per unit

Specifications:

- Pole to Pole distance – 3 mt
- Height of the pole - 3 mt
- Footing Depth (from the ground level) – 1 mt
- Ground level protection wall (local stone RR masonry) -0.35 mt (H), Bed concrete – 0.15 mt (D)
- Chain link around the fence – 3 mt (H)
- Green mesh around the fence – 2 mt (H)
- V-shaped pole top galvanized steel barbed wire - 2300 Rmt

Cross section of Herbivore Enclosure above and below the ground level



- **Boma Enclosure: -**
  - Area – 1 ha
  - Cost – Rs. 5.00 lakhs per unit (1 No)
- **Inspection & Monitoring room: -**
  - As required
  - Cost – Rs. 7.00 lakhs per unit (2 Nos.)
- **Renovation of Existing Base camp: -**
  - As required
  - Cost – Rs. 5.00 lakhs per unit (1 No.)

7.2.2.6.1. Housing location considerations: -

The guidelines in the STANDARD OPERATING PROCEDURE TO DEAL WITH ORPHANED/ ABANDONED TIGER CUBS AND OLD/ INJURED TIGERS IN THE WILD will be taken into consideration while designing the enclosures.

Some considerations to be noted are:

1. Nature immersing structure.
2. Due regard to animal behavior.
3. Safety and security for staff and animal.

4. Provision for escape from dominant animal in case of infighting.
5. Species specific enrichment.

In accordance to these, the enclosure will be made in a natural environment with fewer disturbances to the natural structures – viz. rocks, grasslands, tree cores, water streams and so forth. Wherever additional augmentation is required, the location shall be augmented to enhance/ support the existing functionality. Especially the existing water stream will be diverted in flow such that it undulates into all the different individual enclosures within the tiger re-wildling project.

To ensure water availability year-round for the tiger enclosures, nursery enclosures and the prey animal enclosure, additional solar bore wells shall be added in a manner in which it fills the upper side of the stream during dry season and flows all the way into each enclosure and finally exits the animal re-wildling area downstream. Enrichment considerations inside the tiger enclosure will be fulfilled by allowing the water stream through for cooling off during the day and also an artificial den will made to give a place to hide in and feel secure.

The NTCA guidelines recommend two concentric circles with the outer to carry prey population, whereas the inner for the predator. In the present scenario, since more than one tiger cub needs to be considered, the inner circular enclosure pattern is considered as a bi-circular structure (diploid shape) with the conjoining area being developed into the nursery enclosure.

(i) The Herbivore Enclosure:

The herbivore enclosure will be the outer circular enclosure. This will be a 15-30 hectare structure to house wild prey species. This structure is made by chain link fence upto 3 meters height overlaid with green mesh upto 2-meter height held in place by supporting poles 3 meters apart. The pole height measures 3 meter above the ground. The poles will be supported below the ground to a depth of 1meter with a 0.5-meter-wide MM concrete filling.

The poles will also be having V- shaped top with barbed wires above the height of the chain-link to prevent predator entry from the outside.

This will be strengthened further with a protection wall made of stone RR masonry upto a height of 0.35 meter above the ground and 0.15 meter below the ground to give added protection from snakes and the likes.

Other key feature to be handled within the herbivore enclosure includes: -

(i) Grassland augmentation by partitioning and clipping off existing grass once every year. This will do by dividing the area into 6 parts and completing the clipping work on one portion at a time with a 2 week break in between.

This gives time for new, fresh and highly palatable grass growth which are most preferred by the wild ungulates. However, since it is done in parts, the stress to the ungulates is comparatively lesser and they also have enough grass to meet their dietary need from the remaining 1/5th portion of the enclosure.

(ii) Excess prey population must be released outside if they tend to be over populated in the enclosure. This needs to be done to ensure that the entire enclosure doesn't go into an overgrazed state since wild ungulates maintained in predator enclosures tend to reproduce very fast.

(iii) The herbivore enclosure will be designed with a small pond by extending the existing land dips. This will have a slopy bank with low height so that the animals can easily come out if they enter in it. The water exiting from here will flow into the stream that enters the other enclosures.

(iv) A solar power operated motorized pump will be installed in such a way that water from the pump flows gradually along the enclosures and enters the pond. This will be used to ensure water availability to the prey animals during dry seasons.

(v) The herbivore enclosure will also comprise of a funnel shaped boma extending from one end of the outer fence all the way to the tiger enclosure on the tail end of the structure. This will help in trapping local prey animals in situations where the preybase shortage might occur.

(ii) Tiger Enclosure:

The tiger enclosure sits in the middle of the entire structure. It consists of two adjoining circular enclosures made of 7 hectares each tagged to nursery enclosure. The tiger enclosure will be the place where the tigers will spend most of their life during the re-wilding phase and so meticulous care shall be taken in the design and management. Once the tiger has made their first few kills, they will be released in each of these enclosures where prey ungulates will also be released. The tigers are given their own pace of time to make their kills. They are maintained in the enclosure until

each tiger makes 50 successful kills before they can be released back into the wild (as per S.O.P)

The tiger enclosure comprises of a mixed jungle simulating landscape with grasslands to one side and dense tree cover on the other side. It will serve to house prey animals after they are sent in through various sliding gates in this enclosure providing good forage and water for their survival until they are killed by the tiger. It also contains a flowing stream with perennial water supply, becoming the source of drinking water as well as a spot for cooling off during hotter days. It will also comprise a natural den for each enclosure when the tiger can rest whenever required.

The 2 enclosures will be surrounded by a few camouflaged watch towers and CCTV system through which, all data on health, behavior and feeding shall be documented routinely. The mid adjoining region of these two circular enclosures will hold the nursery enclosures. The enclosure is designed using chain link mesh held in place by poles 4.6meter tall, placed 3 meters apart.it is again covered by green mesh upto 2 feet height. The top of the poles is fitted with V- shaped galvanized rods with barbed wire stretching across the entire length. The depth of each pole is 1.5meter below the ground, held by concrete masonry.

The ground level protection wall of 0.35-meter height above the ground with RR stone masonry and 0.15 meter below the ground as bed concrete will be laid to protect from burrowing animals and snakes. Two sliding gates and huge gates (elephant gate) will open into each of the tiger enclosures from the outer herbivore enclosure. The sliding gates will be continuous with a small passage way with another gate through which prey animals will be sent into the tiger enclosure.

The sliding gates will be nearer to the two ends of the nursery enclosures at the joining area between the two tiger enclosures. The elephant gate will be on the far end. A total of not more than 4 watch towers shall be built at strategic locations for monitoring purposes.

(iii) Nursery enclosure:

The nursery enclosure will be a paired structure built in the middle of the tiger enclosure covering an area 20 meters wide and 20 meters long to house the tiger cubs when they are young. This enclosure will have a carnivore-proof roof as well to prevent other wild animals of the region from attacking the tiger cubs at young stage.

A monitoring unit will also be adjoining the width of the two nursery enclosures to enable access for personnel to approach nearer for close monitoring at early stages in case of any emergencies. The monitoring area measures 5m X 40m.

The nursery enclosures also enclose a den each of the specified design built using locally available materials to make if more nature simulating. The water stream will be diverted to flow through the two nursery enclosures in order to provide drinking water and for cooling off during hot climate.

The tigers will be kept in this area until they learn to kill, for this reason, required chicken and 10 goats shall be housed and reared based on feasibility and necessity. A small fenced enclosure measuring 10mX10m shall be built next to the staff room to house the goats using locally available materials.

Care should be taken to avoid imprinting as prescribed in the NTCA SOP TO DEAL WITH ORPHANED/ ABANDONED TIGER CUBS AND OLD/ INJURED TIGERS IN THE WILD.

7.2.2.6.2. Feeding:

Feeding management involves the following steps:

a) Feeding of tiger cubs

b) Feeding of tiger cubs until learning to hunt

c) Feeding of prey animals

a) Feeding of tiger cubs in re-wilding enclosure: -

As per the NTCA guidelines, the tiger cubs have to be reared in the re-wilding enclosures until they have successfully made 50 kills, and then, they will be released into the wild.

The main hunting process will happen in the tiger enclosure. Therefore, provisions shall be made for the tiger to display all natural behaviors in this area. This will include rocks and variable ground surfaces and tall grasses, which act as good stalking spots, just as in the wild. In this area, spotted deer and other prey animals will be sent inside from the outer herbivore enclosure in small groups of 2-4 in a phased manner for the tigers to make their kill whenever they require feed. For this preybase to survive until being killed by the tigers, the grasses inside the tiger enclosures shall be maintained with good quality, palatable species of grass.

Additional foraging tree species may also be transplanted inside the enclosure if needed before the tigers are brought to the enclosure. Also weed eradication to favour grassland development should be followed for this reason. Prior to the tigers learning to make a kill, they will be reared in the nursing enclosure.

b) Feeding of tiger cubs in nursery enclosure: -

The diet in the nursing enclosure will be a transitioning process from the diet in which the cubs are already maintained (raw meat) to the diet they will have to live on, after being released into the wild.

Once the tiger cubs are brought to the nursery enclosure, they will be fed initially with raw meat. However, NTCA forbids purchasing meat from outside due to the question of doubt over hygiene of the said products. So, about 20 goats shall be purchased in advance, dewormed, health screened and maintained in a small enclosure to be slaughtered and the meat to be fed to the tiger cubs during the initial 5-10 days.

Diet plan prescribed in the NTCA SOP shall be strictly adhered to. During this phase, a live goat (or) a live chicken should be left inside the nursery enclosure, to allow the tiger cubs to learn to make a kill. Goats/ goat kids are preferred because they are slower than natural wild prey but closely similar to it. However, in cases where a tiger never learns to make a goat kill, desi poultry can be used. Various factors that would trigger the natural hunting instinct to begin should be introduced such as prolonged delay in next feed or smell of blood or other such factors to instigate the tiger cubs to begin their hunt at this stage.

Once a tiger cub has made its first kill, it can easily graduate from poultry kill to goat kill to deer fawn kills during the days spent inside the nursery enclosure before shifting into the bigger re-wilding enclosure.

(c) Feeding of Herbivores/ Prey animals in the prey enclosure: -

Grassland management of the herbivore enclosure plays a major crucial role in this process. Planting of palatable grass species, removal of weeds and cutting down of unpalatable grasslands becomes a major part of the task in this area. Whenever required, supplementations such as salt licks may also need to be considered for maintaining the mineral requirements of the prey species housed inside this enclosure.

(d) Feeding of additional livestock maintained to feed to the tiger cubs: -

In order to feed the livestock maintained for the purposes of the initial few days of tiger feeding, roughage can be supplied in the form of green and dry grasses available locally. An additional support to the diet in the form of concentrates will ensure that the tiger cubs get prime/ good meat right from day one.

7.2.2.6.3. Health Care: -

The health care and management involve the following two phases:

a) Health care of tiger cubs

b) Prey population health status

a) Health care of tiger cubs:

A health chart shall be maintained, and the daily apparent health status of the animal shall be documented by the managing staff members with veterinary observation and document verification being carried out at least once every three days and preferably whenever possible, once every day.

The health chart shall contain objective-type points to document basic observable signs of health such as general appearance, behavior, body condition score, time spent per day on active play, time spent per day on sleep, gait while
walking, kill attempts, posture/stance, etc. The day-to-day monitoring team will be trained in understanding these details and documenting them on a 24-hour rotation basis.

Any sign of dullness, injury, in-fighting or any other signs that might warrant an emergency veterinary intervention shall immediately be conveyed to the veterinary officers of the forest department over wireless communication and they shall immediately attend to it.

The fecal and urine excretion shall also be documented on a daily basis by the monitoring team and whenever possible, photographs shall be taken and forwarded to the veterinary officers. Any changes in color, consistency and frequency noticed in this aspect shall be alerted to the veterinary officer for immediate detailed observation.

Periodic fecal examination shall also be done for the tigers for monitoring of parasitic load at the wildlife dispensary lab. The monitoring team shall also be trained to monitor all natural orifices to look for any signs of sickness. These will also be

reported to the veterinarians along with photographic data, for further detailed observation.

The vaccination and deforming schedule presently followed for the tiger cubs shall be continued inside the nursery enclosure. Once they are moved from nursery to bigger enclosure, this may be withdrawn gradually and biosecurity shall attain utmost priority because eventually they must adapt to the wild health wise also. However, at this stage, if any tiger continuously falls sick quite often, consideration has to be made to the rare possibilities of an animal with weak immunity. Such animals must be decided to send to the zoo for lifetime captivity since their chances of survival in the wild in the future is weak.

The veterinarian shall maintain the health/ treatment record. Whenever any changes is noticed should brought to their attention. They shall start monitoring and documenting the progress of the disease on a daily basis. Treatment shall be initiated immediately through placing oral medications inside meat at the initial stage and update the project head on the plan of action. Whenever, the oral medication doesn't show progress (or) when there is critical health observations required to be made, the project head must be immediately informed and immediately the tiger must be tranquilized (whenever needed) and detailed health checkup must be carried out.

The animals that are found to be compromised (beyond mild infection stage) must immediately be removed from the re-wilding and shifted to the veterinary facility for treatment whenever required and the area within the enclosure should also be disinfected as per protocols based on whatever type of disease is the identified cause, so that the environment doesn't become a regular harboring source for the infectious microbes. The spraying/ spreading of sanitizers will be followed as per its detailed description in this detailed project report under its respective section.

(b) Health care of prey animals:

Healthy food gives a healthy life so the health care of the preybase is very crucial for the health of the tiger cubs. So, health screening of preybase begins right at their places of origin. Preybase from existing enclosures within the tiger reserve may be screened for health, months before the animals are brought to the re-wilding project site.

Prophylactic deworming and antibacterial therapy may be carried out to ensure they are apparently free of any diseases. In these cases, withdrawal time for the medicines

to exit the body post-treatment has to be provided as well to ensure that no residual antibiotics/ anti-parasitic are brought into the environment of the re-wilding enclosure. However, this meticulous planning may not be required for those animals trapped directly onsite using the boma technique, because they are already a part of that environment and this wild population naturally contains better immunity than the others.

The health chart maintained for tigers may also be used in this enclosure as well. However, in the situation of the tigers, individual animal health is prioritized whereas in the case of deer and other prey species, herd health will be prioritized rather than individual animals. For this reason, all sick/ weak looking animals identified during the daily monitoring activity may be removed out of the enclosure immediately to prevent spread of disease to other animals within the enclosure. Those removed in this manner may be shifted to one of the deer enclosures within the tiger reserve where they will be treated and later released into the wild after recovery. Critically sick prey animals may also be shifted out to other deer enclosures in the similar manner where they will be maintained until they recover or die. In case of such death, detailed necropsy will also be carried out in order to plan out the next line of action for the health care of the herbivore inside the prey enclosure.

(c) Health care of other livestock:

The livestock preferably chicken/ goats used as meat and as the first few prey for hunting shall be procured from reliable government animal husbandry/ veterinary university managing farms having proven data of no infections or contamination where demonstration farms where animals are maintained and healthy excess stock animals are sold for such purposes. Care should be taken to not buy these animals from those government institutions where culled animals are sold because that can become a source of disease infection.

Care should also be taken not to purchase from local farmers since most of these animals may not have been maintained under highest bio security standards, and therefore will be silent carriers with regular shedding of infectious bacteria or viruses \through various routes. These shall also undergo screening for parasite and bacterial and respective anti-parasitic and anti-bacterial therapy with sufficient withdrawal period before being used as feed/ prey for the tigers.

(d) Protection / Watch and Ward:

Round the clock surveillance is need of an hour against human disturbance, fire during summer and trespassing of free ranging wild animals into the proposed enclosure. Therefore, a monitoring station with all required logistics shall be developed near to the enclosure. However, the caution should be taken that the monitoring unit shall not become a disturbance for the animals in the enclosure, making the activity counterproductive.

In this regard, the existing Peddapenta Base Camp which is more than 350 meters away from the outer boundary of the proposed enclosure shall be converted as monitoring station, provided ensuring alternate arrangements for the existing base camp in another suitable location. The services of NSTR Veterinary team shall be utilised for regular monitoring and on demand. Moreover, for daily monitoring and feeding of wild animals, 4 Outsourcing employees shall be engaged and trained in animal keeping.

Apart from the manpower, reliable modern technologies with solar power enabled shall be adapted for protection, surveillance and monitoring purpose to trim disturbances for animals. For instance, Solar powered CCTV surveillance is a good option with a monitoring set for seamless surveillance and monitoring. Monitoring involves observation of the health of the tiger and its behaviour and at times, there will be a need for the monitoring team to venture into the tiger enclosure to observe and monitor the tigers, Therefore, less noisy vehicles/Electric Vehicles should be placed on standby at their disposal for proper monitoring.

(e) Sanitation and General House Keeping:

Sanitation begins right from the entrance and road network to the spot.

A wheel dip wide enough to completely immerse the entire circumference of the largest vehicle to possibly come to the tiger re-wilding area must be made on the road about 30-5-meters prior to reaching the staff room. The depth shall be upto 3/4th feet with slopy entry and exit sides. The water in the wheel dip should be removed and fresh water with bleach or potassium permanganate must be filled in.

A foot bath should be placed on every pathway entering into the larger herbivore enclosure and the monitoring unit. This should be filled with diluted bleach solution and should be changed and reconstituted each morning prior to beginning any other activity for the day. The entire enclosure area should be sprayed with diluted sodium

hypochlorite solution three consequent times with a gap of three days between each spray. The same procedure should be repeated three times and then the entire enclosure area must be washed with water prior to the arrival of any animals.

All gates and latches should be sprayed with disinfectant solution twice a week.

The tiger fresh scat or urine should be collected and applied in a particular undisturbed portion of the enclosure (which has ease of visible observation from the outside) prior to releasing of tigers into the enclosure. Care should be taken that this area should be approachable easily from the outside using vehicle or elephant without having to move a great distance inside the enclosure for any fecal or urine monitoring. It should also be a spot with maximum sunlight so that all defecation dries out quickly and does not become a source of bacterial/ fungal growth. This location should also be away from any water sources to avoid contamination.

All utensil, equipment, fomites, etc. should be washed and cleaned daily. So, all such materials used should be purchased doubly so that one set may be cleaned and dried when the second set will be in used. Frequent disinfection of these materials is also necessary on a regular basis to ensure they do not become a source of growth for microbes. Dedicated clothing shall be used for activities inside the tiger enclosure. These shall be purchased in multiple sets and shall not be used outside the tiger enclosures, but rather exclusively for that purpose only. The cloth materials should be autoclavable and separate provision s for washing and autoclaving them must be arranged at the staff area. All such equipment's should also be exclusively used only for those purposes and not misused for any other causes.

7.2.2.6.4. TRAINING AND CAPACITY BUIDLING: -

Considering the fact that the idea of in-situ enclosure for re-wilding is a first of its kind in Andhra Pradesh, there is a need for focus on the knowledge transfer, assimilation, expertise and proficiency in handling wild animals and monitoring. And so, training and capacity building for field officers, veterinary team and animal handlers are contemplated.

In-house and hands-on training for animal keepers are essential, as the proposed enclosure needs to house both herbivore and carnivore population. NSTR team shall with support of the zoos of Andhra Pradesh shall train the keepers.

Moreover, the skills of Field Officers need to be fine-tuned with respect to the following:

i) Capture

ii) Tranquilization

iii) Shifting

iv) Transportation

v) Release

vi) Observation & monitoring.

In this regard, NSTR team shall collaborate with NGOs with expertise in animal handling, rescue and release for knowledge sharing.

Moreover, the Field Officer shall be offered with exposure visits to various other protected areas across India to gain knowledge on the best practices pertaining to the re-wildling enclosure.

7.2.2.6.5. Action Plan and Budget Requirements:

Action Plan: -

Step 1 – **Immediate activities proposed (within 75 days)**

- Creation of nursery enclosure on war foot basis and shifting of cubs to the nursery enclosure.
- Creation of Tiger enclosure
- Creation of a small 10 ha. herbivore enclosure.
- Trap, transportation and release of wild / captive herbivore population in the herbivore enclosure to promote augmentation.

Step 2: - **Activities proposed for the next 12 months consequent to step-1**

- Enlarging herbivore enclosure from 10 ha. to 25 ha.
- Release of tiger cubs from nursery enclosure to tiger enclosure following due standard operating procedure.
- Seamless monitoring for re-wilding.

Step 3: - **Activities proposed for the next 24 months consequent to step-2**

- Regular monitoring.
- Preparation for the release of the cubs in the wild as per standard operating procedure.
- Ensuring radio collaring and regular tracking / monitoring

7.2.2.7. THEME PLAN VII: Climate Change Mitigation

NSTR, being India's largest Tiger Reserve, has a variety of habitats that are defined by climatic factors such as rainfall, altitude, and soil types. The rainfall varies from 650–1100 mm; however, the pattern of rainfall has changed in the past decade or so. The number of rainy days has come down drastically, and the rainfall is also irregular and sporadic. There are times of heavy rainfall causing flash floods, erosion, and run-off. Tiger reserves are not only crucial for the conservation of biodiversity but also play a significant role in mitigating climate change. As climate change poses increasing threats to ecosystems worldwide, it is imperative to develop comprehensive mitigation strategies within tiger reserves. This theme plan outlines key strategies and actions to address climate change impacts in tiger reserves while promoting biodiversity conservation and sustainable development.

Step 1: Mapping and assessment of Climate Vulnerability:

- A study needs to be conducted for comprehensive assessment of climate vulnerability within tiger reserves, including projected impacts on habitats, wildlife populations, and local communities.
- Identify priority areas and species most vulnerable to climate change to guide conservation efforts.
- Identify areas which has seen changes in vegetation in recent past using remote sensing data.

Step 2: Habitat Restoration and Connectivity

- Taking up habitat restoration initiatives should be planned, which are landscape specific to enhance resilience to climate change impacts, such as reforestation, afforestation, and restoration of degraded habitats.
- Establish and maintain ecological corridors to facilitate the movement of wildlife and enable species to adapt to changing environmental conditions.

Step 3: Climate-Resilient Land Use Planning:

- Implement zoning regulations to protect critical habitats and buffer zones, considering future climate scenarios and important areas along the streams which remain resilient to harsh summers should be managed and protected.
- Develop land use plans that incorporate climate change considerations, such as avoiding vulnerable areas for infrastructure development and promoting climate-smart agriculture practices.
- Involve local communities in climate adaptation efforts through participatory approaches, including community-based natural resource management and livelihood diversification. Provide training and support for sustainable agriculture practices, alternative energy sources, and income-generating activities that reduce dependence on natural resources.

Step 4: Carbon Sequestration and Emission Reduction:

- Promote carbon sequestration initiatives, such as reforestation, agroforestry, and wetland restoration, to enhance carbon storage within tiger reserves.
- Implement measures to reduce greenhouse gas emissions from activities within tiger reserves, such as promoting renewable energy, improving waste management, and reducing carbon footprint in tourism and infrastructure development.

Step 5: Research and Monitoring:

- Conduct research to better understand the impacts of climate change on tiger reserves and monitor key indicators of ecosystem health and resilience.
- Establish long-term monitoring programs to track changes in habitat, wildlife populations, and community well-being in response to climate change.

Step 6: Capacity Building and Awareness:

- Provide capacity-building programs for park staff, local communities, and stakeholders on climate change adaptation and mitigation strategies.
- Raise awareness among visitors, policymakers, and the general public about the importance of tiger reserves in mitigating climate change and the need for collective action.

7.2.2.8. THEME PLAN VIII: Forest Fire Management:

Fire plays a key role in degrading dry ecosystems like NSTR. The long dry season makes forest of the tiger reserve vulnerable for fire with most of the instances of fires are caused due to negligence, NTFP collection, cattle grazers or arson by local villagers.

Step 1: Proper zonation of NSTR for Vulnerability of Fire.

- Historical fire data can be used as input for understanding the regularly burned areas in NSTR.
- The causes of fires have to be identified at the beat levels in the past and possibility in the future.
- Vegetation map along with other factors to be used to develop range level fire risk Zonation.

Step 2: Prevention and Preparedness:

- Implement measures to prevent human-caused fires through public awareness campaigns, education, and enforcement of fire safety regulations.
- Development and maintenance of a standard fireline both inter range and inter division boundaries, firelines along the existing road network, coupe roads, firebreaks on need basis, establishment of temporary fire camps, deployment of fire watchers, machineries such as fireblowers, grass cutters, customized water tankers and infrastructure to create defensible space and reduce the spread of wildfires.
- Conduct regular training and drills for fire personnel and local communities to enhance readiness and response capabilities.

- Equip staff with firefighting equipment that includes blowers, tankers, safety gear etc.
- A database / register shall be maintained in each range and division for creation and maintenance of fire lines.

Step 3: Early Detection and Monitoring:

- Establish a robust system for early detection of wildfires, including the use of fire towers, live updates from NRSA, and community-based monitoring networks.
- Integrate satellite data, weather forecasts, and fire behavior models to assess fire risk and anticipate potential fire events.
- Utilize drones and other aerial platforms for rapid assessment and monitoring of fire incidents in remote or inaccessible areas.

Step 4: Suppression and Control:

- Develop coordinated response protocols and mobilize resources, including firefighting crews, equipment, and aircraft, for timely suppression of wildfires.
- Prioritize suppression efforts based on risk assessment, ecological values, and threat to human safety and infrastructure.
- Employ both ground and aerial firefighting tactics, including controlled burns, water drops, and fire line construction, to contain and extinguish wildfires effectively.

Step 5: Ecological Restoration and Recovery:

- Assess post-fire impacts on ecosystems and prioritize restoration efforts to mitigate habitat loss and promote recovery of biodiversity.
- Implement revegetation and erosion control measures to stabilize burnt areas and prevent soil erosion and degradation.
- Monitor post-fire vegetation dynamics, wildlife populations, and hydrological processes to inform adaptive management strategies and promote ecosystem resilience.

Step 6: Community Engagement and Collaboration:

- Use open-source data to map fire-prone areas.
- Foster partnerships and collaboration among government agencies, non-profit organizations, local communities, and indigenous groups to address fire management challenges collectively.

- Involve stakeholders in decision-making processes, fire planning, and implementation of fire management strategies to ensure inclusivity and ownership.
- Provide education and outreach programs to raise awareness about the ecological role of fire, fire safety practices, and the importance of community involvement in fire management efforts.

7.2.2.9. ZONAL PLAN IX: Religious Green Pilgrimage in NSTR:

Numerous places of worship/pilgrim sites, such as Bramaramba Sri Mallikarjuna Temple, Srisailam, Istakameswari Temple, Rudracode Temple, Gundla Bramheswara Temple, and many more temples, exist in the Nagarjunasagar Srisailam Tiger Reserve (NSTR), holding significance for local communities. There is a huge influx of pilgrims in the core area of the Tiger Reserve during Shivaratri and Ugadi festivals. It is estimated that more than four (4) lakh pilgrims during Shivaratri and six (6) lakh pilgrims during Ugadi festivals use the footpath of about 40 km, which passes through the core area of the Tiger Reserve during February, March, and April every year. Consequently, this is causing irreparable and lasting impacts on the wildlife habitat and biodiversity in Nagarjunasagar Srisailam Tiger Reserve. Pilgrims throw large quantities of plastic waste, garbage, solid waste, chappals/slippers, etc., attend to nature calls, and bathe in natural water bodies in the core area, resulting in pollution of the water bodies. It becomes extremely difficult for the Tiger Reserve authorities to control the huge influx of pilgrims during the festival season. Balancing the needs of religious sites and tiger conservation is challenging but essential. The National Tiger Conservation Authority (NTCA) also acknowledges the need to manage religious tourism within carrying capacity.




Map 52: Showing the Pilgrims' Path from Venkatapuram to Srisailam In NSTR



7.2.2.9.1. Guidelines to reduce the impact in Tiger Reserve:

Bridging the gap between religious practices and conservation efforts is essential for sustainable religious tourism. The management of Religious Green Pilgrimage in Tiger Reserve necessitates an overarching framework that emphasizes collaboration, sustainability, and environmental stewardship. At its core, this framework relies on close cooperation between Tiger Reserve authorities, religious institutions, conservation organizations, and local communities. By working together, stakeholders can effectively address the complex challenges posed by religious pilgrimages while safeguarding the natural environment. Sustainable practices are paramount in this

endeavor, as they help minimize the environmental impact of pilgrim activities on fragile ecosystems within tiger reserves. Through proactive measures and responsible management, the framework aims to strike a balance between religious traditions and conservation priorities, ensuring the long-term viability of Wildlife & its habitat, biodiversity and cultural heritage.

7.2.2.9.2. The impact of Religious Pilgrimage Tourism in Tiger Reserve:

1. **Waste and Sanitation:** High levels of open defecation, plastic, and other litter (often consumed by wildlife), Non-biodegradable and Solid waste dump creation.
2. **Water Pollution:** Pollution of natural Water bodies, streams, springs and other water harvesting structures. Dangerous and increasing levels of *Ecoli* in streams/river water with downstream Indigenous communities reporting dysentery, skin rashes, and food poisoning for months after the festival.
3. **Disturbance to Wildlife & its habitat:** Noise, lights, traffic, large crowds camping and walking through Core area of Tiger Reserve and biodiversity rich areas. Immense disturbance to Wildlife, its habitat and biodiversity.
4. **Forest Fires:** During festival season of Shivaratri and Ugadi from February to April every year, the Tiger Reserve experiences large number of man-made Forest fires mostly in Pilgrimage foot path/route. The fires eventually spread to other parts of Tiger Reserve. Many a times it becomes extremely uncontrollable.
5. **Damage to surrounding Flora and Fauna from camping:** Due to camping of pilgrims inside the Tiger Reserve, there is a great degree of damage noticed to surrounding Flora and Fauna in the Tiger Reserve.

7.2.2.9.3. The Green Pilgrimage Model:

- During the festival season of Shivarathri and Ugadi, there is an average footfall of approximately 50–60 thousand pilgrims per day over a period of 10 days for each of the festivals, who use the forest route to reach the temple. Given that both festivals coincide with the peak summer/fire season, when forest resources are already very scarce, this causes a significant impact on the forest and wildlife. Hence, there is a need to regulate and control the number of people who enter the forest. As a step to ensure this, it is proposed to put a cap on the number of people who enter the tiger reserve in a day. Therefore, it is proposed to restrict the number to 8–10 thousand people per day. As an initiative to reduce the impact of the pilgrimage, we propose to introduce Green Cess (GC)/Environmental

Maintenance Charges (EMC), with the approval of the Government. The EMC charges collected would go towards restoring the natural habitat in order to maintain its ecological value. Further, a token amount of park fees should be charged to tourists visiting the temple. Initiatives like waste/plastic cleanup through employing local tribals as swachh sevaks, fire watchers, protection watchers, and other such steps can help restore the habitat.

- It was observed that, open defecation by pilgrims at the natural water bodies in the tiger reserve has caused contamination of water and the impact of which are noticed throughout the year. There is an urgent need to protect these scarce resources, particularly during summer. As a step to reduce the impact of this, we suggest exploring alternatives to using natural water bodies for all human needs.
- As stated in the above point, impact of human pressure has lasting effects throughout the year, hence there is a great need to restrict human/pilgrims' movement inside the tiger reserve only during the festivals of Shivaratri and Ugadi. The pilgrims shall be permitted to use the existing pilgrim path from Venkatapuram to Kailasha Dwaram via Pecharuvu for a period of 7 days before Shivaratri and Ugadi. Barring these two festivals, general public, pilgrims, vehciles or any other activities shall not be permitted.
- Research the dynamics of religious tourism in tiger reserve and impacts and threats to biodiversity.
- Make recommendations for improved management of the Tiger Reserve before, during, and after pilgrimages.
- Support the establishment of multi-stakeholder committees to develop and launch co-management plans for a more conservation friendly pilgrimage.
- Launch awareness campaigns before and during pilgrimages that includes faith-based conservation messages.

7.2.2.9.4 Role of different stakeholders:

The Government of Andhra Pradesh vide G.O.Ms.No.11 Establishment – Forest department - & T (SEC.II) Dept., dated 06.02.2024 **(Annexure.XIV)** has constituted a committee to study the issues and initiate measures to avoid man animal conflict over improper disposal of garbage and indiscriminate use of plastic bottles and polythene bags.

a) Role of Forest Department:

- Ensure protection of forest and wildlife
- Control/prevent Forest fires along the pilgrim walking path
- Enforcing the ban imposed on plastic and other anthropogenic impacts.
- Collection of the proposed EMC/Green Cess, with approval of Government.
- Coordination with the Srisailam Temple Authorities, Police Department and Fire Service.
- The Deputy Director, PT, Atmakur shall exercise due diligence and assess the need while according temporary permissions for setting up Annadanam or other pilgrim facilities by NGO's, Individuals or any other body of Individuals, keeping in view of the significance of this area for wildlife. All the conditions imposed by the Deputy Director shall be adhered to strictly and deviation in this regard will be dealt with as per the conditions stated in the agreement and relevant laws and rules in force.
- A Refundable Security Deposit of a minimum of Rs.50,000/- (which may be subject to increase as per the conditions) shall be collected from each of the participating bodies. In addition to the refundable security deposit a one-time Environmental Maintenance Charge of a minimum Rs. 20,000/- shall be collected from NGO's, Individuals or any other body of Individuals who intend to set up pilgrim facilities.

b) Role of Srisailam Temple Authorities:

- To provide manpower (Swacch Sevaks, Fire watchers and Protection Watchers) to the Forest Department (NSTR) during festival season of Shivarathri and Ugadi to ensure the forest is free of plastic or any other solid waste created by the pilgrims visiting Srisailam Temple. Given the scale of impact by pilgrims, manpower of 100-120 people shall be required to mitigate the impact.
- Special attention to be given to the footwear discarded by pilgrims at Bimuni Kolanu, where four to five (4-5) truckloads of footwear and other plastic waste are recklessly thrown on either side of Bimuni Kolanu. It is a great logistical challenge to clean this waste. Temple authority to actively coordinate with NSTR in this regard.
- It shall be the role of Srisailam Temple Authority to ensure that sufficient

waste disposal bins are provided at every 500 meters along the pilgrim walking path.

- Coordinate with forest department for making food and other amenities for the walking pilgrims.
- Water tankers are to be arranged by the temple authorities to meet the requirements of the pilgrims.
- RO water facility to also be provided by the temple authorities.
- Any other steps necessary to ensure sanctity of the Tiger Reserve is maintained to be taken up.

c) Role of other Departments/stakeholder:

- District Administration to actively engage with the NSTR authorities and provide all the necessary logistic and administrative support.
- Police Department to support the Forest Department in managing people, regulate traffic and maintain law and order.
- Fire Service to be on stand by and help in the instance of uncontrolled fire outbreak in the tiger reserve.

d) Garbage cleaning along such pilgrims' routes around temples shall be done by temple authorities under guidance and co-ordination of NSTR authorities (Field Director). If temple authorities are not able to do, they shall pay for cleaning decided by NSTR & Temple authorities. Further, any kind of permanent civil structures should not be allowed in forest area for pilgrim's purpose. Only any change can be allowed inside area notified area of particular temple in Gazette notification. NSTR & Temple authorities (after permission form Field Director) may provide necessary and basic facilities like drinking water to pilgrims. No plastic shall be allowed inside NSTR and Temple authorities shall work towards plastic free NSTR.

7.2.2.9.5 Conclusion:

The "Green Pilgrimage" Model has great potential for application to NSTR. There is a critical need for integrating Responsible and Green religious pilgrimage with Wildlife conservation efforts in Tiger Reserve and there is a necessity of ecological studies to assess potential impacts on Wildlife and habitats. It essentially required for

establishment of multi-stakeholder committees, development of action plans based on research studies and stakeholder input etc., Further, it is important to understand the challenges associated with managing Religious Green Pilgrimage in Tiger Reserves, such as balancing religious and conservation priorities and managing visitor numbers and its impact on the Wildlife and Biodiversity. As NSTR has been declared as Plastic Free Zone from 01.01.2024 and carrying Plastic, non- degradable items are completely regulated. Therefore, it is essential to stop the use of plastic and regulate pilgrimage inside the Tiger Reserve. It is also important to strictly practice low impact, green pilgrimage inside the Tiger Reserve.

Chapter – 8
Research, Monitoring and Training



8.1. RESEARCH OPPORTUNITIES IN CORE AREA OF NSTR:

Research constitutes a very important aspect of effective management of wildlife protected areas and it is crucial for the success of any tiger reserve, which should be compatible with the objectives of a protected area. The Reserve should have clear wildlife research policy with realistic objectives. Priorities need to be recognized on a scale of importance which directly contributes for wildlife management and conservation.

8.2. PAST RESEARCH ACTIVITIES:

Biodiversity Division was established in 1997 as an independent division for the purposes of Biodiversity activities in NSTR. Biodiversity Research Centre was inaugurated in 2001. Over a span of two decades, research regarding wildlife conservation, Biodiversity, and species inventory has been done. The Division is headed by Asst. Conservator of Forests along with Research associates. A biologist or a group of biologists with the required qualification may be assigned to study each or a few of the above subjects in the core area of the NSTR. The biologist(s) may be assisted by the field workers who may be from the local villages and may be given the collector wage rate or the wages of a protection watchers being employed in the base

camps. The Biologist will report to the Assistant Conservator of Forests, Biodiversity Centre, Sundipenta and the research work is monitored by the Field Director, NSTR.

As part of research, some of the specimens of vertebrates and invertebrates found in and around Nagarjunasagar Srisailam Tiger Reserve were collected and preserved in the Biodiversity Laboratory. These specimens were exhibited for education, creating knowledge and awareness on the biodiversity significance and its conservation.

8.2.1. Faunal Biodiversity:

Over 51 species of Mammals, 305 species of Birds, 59 species of Reptiles, 18 Amphibians, 55 Fishes, 101 species of Butterflies, 137 species of Moths, 46 species of Coleopteran, 30 species of Odonata and numerous other forms of insects are inventorized in the area and prepared checklist. Biodiversity Lab is conducting various awareness programmes to Students from High School level to Post Graduates. Approximately 50 people and Students were visiting the Biodiversity Research Centre per day an average.

The other activities carried out by the Biodiversity Division are as follows.

- Conducting All Taxa Biodiversity inventory (ATBI) surveys in NSTR, GBM & Rollapadu Wildlife Sanctuary.
- Species level exhaustive check list of fauna & flora is prepared.
- Discovery of new species names of species and new reports of the species from Nallamalas.

  Coleopterian Fauna: 1. *Dorysthenes rostratus* (Long Horned Beetle)
  2. *Cerapterus latipes* (Flat Horned Beetle)

  Herpetofauna **:** 1. *Coluber bholanthi*, (Nagarjunasagar racer)
  2. *Calliophis melanurus (*Slender coral snake)
- **Scat Analysis:** Prey- predator relationship through Scat analysis. It is commonly applied to study the feeding habits of carnivores.
- **M-STrIPES** : M-STrIPES data received from the divisions of Project Tiger, Atmakur, Markapur, Giddalur and Nandyal are entered into M-STrIPES software in Bio-lab, Srisailam and reports are generated analyzed and submitted to NTCA, New Delhi as a report every month.
- **Phase IV Monitoring**: Phase- IV monitoring in NSTR and Corridor areas are conducted annually and the minimum number of Tigers are identified based on their stripe pattern.

- **Training programmes:** Conducting training classes to the forest staff and awareness programs on Biodiversity conservation to the public. Training programmes conducted to the Frontline staff including FROs, FSOs, FBOs, Computer Operators and Trainees from Forest Training Academies on various aspects of Forestry like wildlife and Forest protection, Web-GIS, M-Stripes, Phase – IV Monitoring, Handling Tranquilizing Equipment, Data analysis using density, Distance and Wild-ID software.

8.2.2. Research Publications:

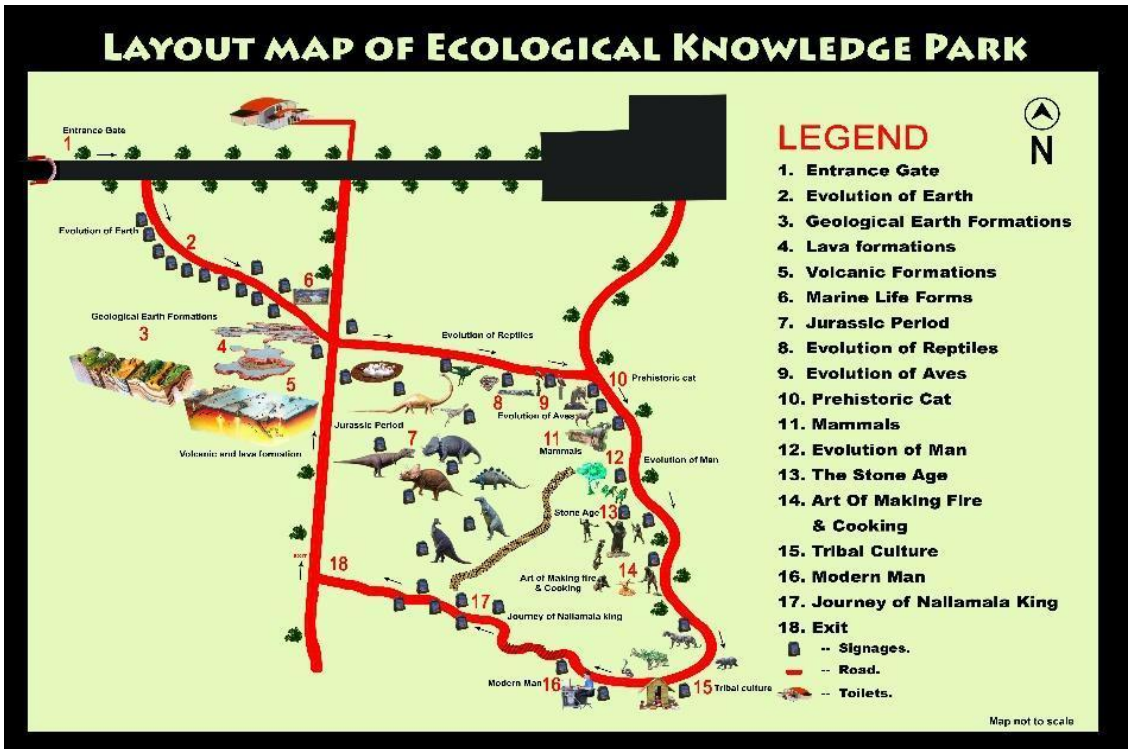
In Biodiversity Research Centre, 16 number of Publications on various faunal species in NSTR have already been published in Zoo's print from Biodiversity Research Centre. Recently two papers were published in Current Biotica International Journal on Coleopterians during 2015-16. Continuous research and monitoring on the following aspects in the critical Tiger habitat of NSTR are to be done by the Biolab Wildlife Capacity Building Centre, Sundipenta.

In addition, various other researchers from many universities such as Osmania University, Hyderabad, Sri Krishnadevaraya University, Ananthapur and Rayalaseema University, Kurnool haveconducted research on various aspects of the Tiger Reserve which have been published in various journals.These are available in Annexure no.VII.

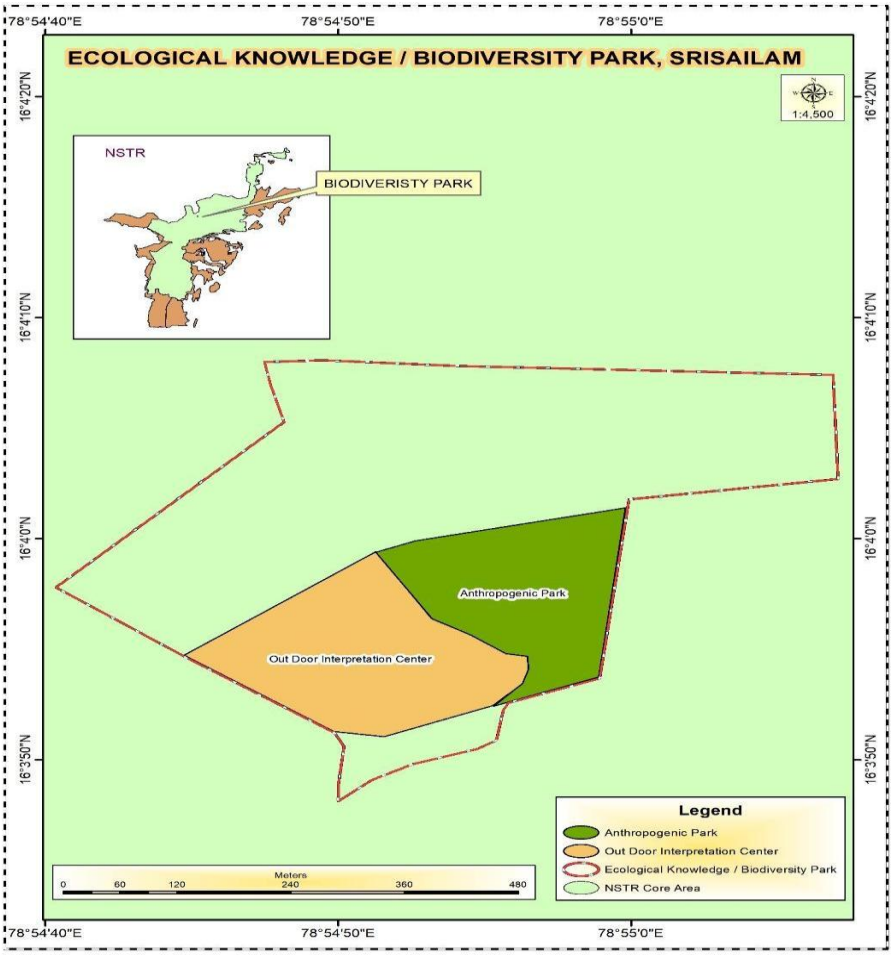
8.2.3. Ecological Knowledge Park

A unique Ecological knowledge park has been developed at Srisailam Project Colony under the control of Assistant Conservator of Forests, Bio-diversity, Srisailam and was inaugurated on 27.09.2012. It is spread over an area of 8.6 ha in highly degraded land adjoining the Srisailam Project Colony. This area has been degraded by the work force settled at the time of construction of Srisailam dam. It is contemplated to develop the whole landscape to demonstrate how a seriously degraded area due to heavy anthropogenic pressure (Man-Animal conflict) could be brought back by enhancing the ecological processes with minimal interventions.

Total Area of the Park	: 8.6 Ha
Outdoor Interpretation Area	: 4.75 Ha
Arboretum	: 0.25 Ha



Map 53: Showing the Ecological Knowledge/ Biodiversity Park Srisailam



Outdoor interpretation is being developed with the theme of Evolution of Life from origin of earth to the modern man in an area of 4.96 Ha. In this area total 46 self-explanatory sign boards were installed with different conceptual model. Nallamala Arboretum is being developed in 0.25 ha. with different floral species like Marri, Tella maddi, Usiri, Kunkudu, Vippa, Regu, Konda regu, Pachari, Velaga, Veduru, Teak, Gummadi teku, Tani, Neredu, Tapasi, Kondagogu, Billudu, Yegisa, gotti, Juvvi, Medi, Ravi, Karaka, konda tangedu, Nemalinara, Tandra, Maredu, Rela, Erra poliki, somi, and chilla.

8.3 RESEARCH PRIORITIES:

The following topics have been listed on priority for which research is essential to maintain the biodiversity of the Tiger Reserve.

- Survey of the flora and fauna of NSTR.
- To determine the carrying capacity of different species of wild animals of Nagarjunasagar Srisailam Tiger Reserve.
- Role of fire as a management tool, determination of burning regimes, cool burning, patch burning or the prescriptions in grassland management.
- Studies on grassland management & development particularly of causes of shrinking or grassland meadows, occupation of invasive species both in grasslands and woodlands and eradication methods, eradication of *Lantana camara*, *Cassia tora*, *Hyptis suaveolens*, *Parthenium hysterophorus*, *Eupatorium*sp., etc.
- Assessing the carrying capacity of Tigers in the Tiger Reserve and the prey density.
- Water resource survey along with requirements of animals in the pinch period.
- Complete study on feasibility of reintroduction of Indian Gaur.
- Impact study of anthropogenic activity and temple tourism.
- Study on Wild dogs, their pack dynamics, social interactions and their distribution.
- Status, distribution and assessment of threats to the Smooth coated Otters in the river Krishna and streams.
- Identification and conservation of vulture habitats and species.
- Analyzing the population dynamics of Chinkara.
- Study of movement and functional corridors in the landscape.

8.4. RESEARCH PROJECTS

Table 43: Ongoing or proposed Research Projects are as follows:

Sl. No	Name of the Research Activity	Justification
1	Research study on Biomass, Preybase density in NSTR	It is ascertained that, the number of tigers is steadily increasing and a study on the preybase is essential.
2	Study on Vultures in Nallamala	After 10 years, Vultures have been sighted in Nallamalas and immediate study has to be taken up to conserve their habitat.
3	Research study on Impact of Fishing cat in NSTR	Fishing along River Krishna in Protected areas of Nagarjunasagar Srisailam Tiger Reserve (NSTR) has adverse impact on the habitat of wildlife. A study on it will widen the horizon of possible solutions.
4	Study on Smooth coated otters in River Krishna	Fishing along River Krishna in Protected areas of Nagarjunasagar Srisailam Tiger Reserve (NSTR) has adverse impact on the habitat of wildlife. A study on it will widen the horizon of possible solutions.
5	Study on impact of Forest Fires in NSTR	Forest fires, year on year kept increasing and the regeneration is being adversely affected.
6	Study and documentation of Avian Fauna and Bio – Diversity of NSTR	Documentation on Avian Biodiversity in Nagarjunasagar Srisailam Tiger Reserve (NSTR) will help in further research.
7	Pangolin & Chinkara	To assess the population, usage of habitat and threats.

Expertise in various scientific aspects of research and monitoring activities would be brought in, thus seeking their help from various Government agencies like Zoological Survey of India, Botanical Survey of India, Wildlife Institute of India, BNHS, NEERI, Fisheries department. Universities of Andhra Pradesh namely Yogi Vemana, Nagarjuna, Sri Venkateswara, Andhra University and Indian Institute of Science Education and Research (IISER), Tirupati may be involved in the research activities of NSTR. Reports from research scholars should be obtained about their research findings to use them in management of Tiger Reserve.

8.5. MONITORING FRAMEWORK:

- Daily recording and monitoring by patrolling parties through M-STrIPES.
- Collecting information from Pugmark Impression Pads (PIPs) on weekly basis.
- Annual Phase IV exercise as prescribed by NTCA, carnivore sign survey and preybase estimation, and annual camera trapping by PA management.
- Implementing the All India Tiger Estimation exercise once in 4 years.

Based on data collected through the above exercises, a database on the distribution of tigers, co-predators and preybase, potential habitats and threats to the population and habitats will be created by ACF, Biodiversity. Reports on the monitoring programme will be submitted to FD and CWW for onward submission to NTCA. Results will be used by the management especially Deputy Directors of 4 Divisions for reframing protection strategies, if needed.

8.6. TRAININGS

Trainings will be conducted periodically for the skill up gradation of Field staff at Beat, Range, Division, Circle and State level. In this regard, the support of various organizations has been taken and it will be continued in future also. The frontline staff and protection watchers have been trained in use and fixing of camera traps, M-STrIPES Mobile, GPS, Range Finders, Hand compass and in protection aspects also.

Table 44: List of trainings proposed for the Officers and staff of NSTR

Sl. No.	Training Subject	Duration	Frequency	Target group
1	Use of M-Stripes mobile in patrolling & wildlife monitoring	3 Days	Every 3 months	Beat Officers
2	Use of Range finders and compass for assessment of the wildlife population	2 Days	Every 3 months	Beat & Section Officers
3	M-STrIPES	2 Days	Every 6 months	Range Officers & Section Officers
4	Wildlife Law & Enforcement	2 Days	Every 6 months	Range Officers & Section Officers
5	Phase IV Monitoring	3 Days	Every 6 months	ACF & Range Officers
6	Collection of Scats of Carnivores	2 Days	Every 3 months	FBO & ABO
7	Hands-on training - ArcGIS for the preparation of maps related to wildlife monitoring	3 Days	Every 6 months	ACF, FRO, Data Entry Operators
8	Personality Development	3 Days	Every 6 months	All officers
9	Exposure to other Tiger Reserves	One week	Every 3 months by different group of officers	FDPT Srisailam, DFO's, ACF's and FROs.
10	Exposure to foreign countries with Tiger conservation	15 Days	Every year by different group of officers	FDPT Srisailam, DFO's,

8.7. HUMAN RESOURCE DEVELOPMENT PLAN

Human Resource Development Plan will be prepared and works will be carried out with the help of Professional bodies like Wildlife Institute of India, Wildlife Crime Control Bureau, State Reserve Police force (Arms training), Laboratory for the Conservation of Endangered Species – CCMB - LaCONES and other State and Central training institutes. The staff will be trained in protection and management of the Reserve. Wherever required, EDC members will also be involved. The following themes are suggested for training during the plan period.

a) Protection

- Intelligence gathering.
- Unarmed combat, survival skills, first aid, swimming and driving.
- Legal provisions of relevant Acts and Rules, Forest Code, Forest Manual and related Government Orders. Booking of WL cases and following up for logical conclusions. Relevant court procedures.
- Directives and other executive instructions and procedures for search, seizure, booking and investigation of offences.
- Modus operandi of poachers/smugglers, knowledge of animal traps, snares and poisons used by poachers.
- Proper use of Arms, ammunition, and servicing of their critical components.
- Communication equipment and their use, operative language as per wireless use code, recording of messages and maintenance of registers.
- Knowledge of battery and solar panel maintenance.
- Installation and maintenance of solar fences.
- Methods of survey, mapping, transect laying and use of survey equipment.
- Use of equipment such as GPS, Compass, Range finder, Altimeter, Wedge prism, setting up of instruments for collecting weather data, instruments for testing soil and moisture etc.
- Maintenance of protection and monitoring related registers.

b) Fire Management

- Preparation of fire protection plan.
- Procedures for taking fire lines, various techniques of modern fire-fighting operations including safety measures.

- Impact of fire, assessment of damage and procedure for reporting.

c) Human-wildlife interaction

- Assessment of extent and types of crop /property damage, animals involved, signs and evidences of crop damage, seasonality and assessing loss and reporting.
- Various traditional as well as modern mitigation measures
- Specific signs of predation (Tiger, Leopard and Wild dog) and carcass examination.
- Follow up procedures in cases of human injuries and deaths by wild animals.
- Rules regarding payment of ex-gratia and insurance provisions.
- Tracking and monitoring of problematic animals and safety precautions.
- Rescue and rehabilitation of animals.
- Techniques for immobilization and restraint.

d) Field techniques for wildlife management

- Identification of wild animals, their evidence and age/sex determination.
- Morphometry of wild animals.
- Identification of wild animals from skeletal parts, skin, hair, dentition, hooves, claws, horns and antlers.
- Identifying indirect evidences of animals such as scat, pellets, hoof/pug marks, scratches, calls, dens and nests etc.
- Characteristic features of birds, reptiles, amphibians, fishes and butterflies.
- Safety precautions against rock bees, snakes, scorpions etc.
- Identification of common species of plants.
- Measuring tree diameter/girth, height and canopy density.
- Vegetation and animal sampling techniques.
- Measuring and monitoring diversity.
- Integrated tiger monitoring protocol.
- Survey of boundaries and mapping of roads, trek paths and habitats.
- Wildlife health monitoring procedures.
- Concept of habitat and its significance.
- Management of invasive alien species.
- Soil and water conservation measures.
- Setting up of camps in the field
- Navigation in the forest
- Survival techniques

Training needs related to eco-development, pilgrim management, education, interpretation and ecotourism management are dealt in the Buffer Plan.

e) Public Awareness and Education:

Theme and activities:

Reaching out to the general public in terms of awareness creation through all forms of media.

Activities:

i) Reaching out to the school children with thought provoking competitions and field visits

ii) Involving children in nursery raising, plantations and patrolling etc.,

iii) Tie-up with schools for the same

iv) Vibrant presence on social media.

v) Creating short videos and documentaries.

vi) Writing story / articles on print media and wide presence in digital media.

vii) Reading out to Companies/Corporations/Philanthropists.

The team shall work under the supervision of Assistant Conservator of Forests, Biodiversity, Srisailam.

Chapter – 9

Tiger Population and Habitat Assessment



Reliable estimates on status and trends of elusive carnivore populations and their preybase as well as evaluation of habitat quality are crucial for effective conservation and management. One of the activities of the Tiger Reserve is monitoring of the status of tigers, co-predators, preybase and evaluating habitat quality at regular interval. As the Nagarjunasagar Srisailam Tiger Reserve acts as the source population of tigers in the landscape, continuous monitoring is important for long term conservation of tigers at landscape level. It is also necessary to document and monitor preybase and related habitat attributes on a regular basis.

This chapter proposes strategies for regular monitoring of tigers, co-predators, prey species and their habitat in line with the methods prescribed by NTCA in order to strengthen the supervision at field level as well as to generate information for evaluating tiger occupancy on a regular basis.

Strategies include:

- Daily recording and monitoring by patrolling parties through M-STrIPES.
- Collecting information from Pugmark Impression Pads (PIPs) on weekly basis.
- Monthly carnivore sign survey and preybase estimation, and annual camera trapping by PA management.

- Implementing All Iindia Tiger Estimation exercise once in 4 years.

Based on data collected through the above exercises, a database on distribution of tigers, co-predators and preybase, potential habitats and threats to the population and habitats will be created by ACF, Biodiversity. Reports on the monitoring programme will be submitted to FD and CWW for onward submission to NTCA. Results will be used by the management especially Deputy Directors of 4 Divisions for reframing protection strategies, if needed.

9.1. Daily monitoring and forecasting

The patrolling party, during their daily patrolling schedule prescribed in Protection Plan will collect the following information on M-STrIPES .

- Direct sightings of all wild animals, including tigers and co-predators in the prescribed proforma (Flow chart 9.1).
- Indirect evidence of carnivores such as pugmarks, scats, scrapes/rake marks, kills, sound etc. in the same proforma.
- Photographs of pugmarks using a digital camera.
- Scats of tiger and leopard for seasonal diet analysis.
- Using M-STrIPES for data collection.

Section staff will submit the filled up proforma along with scat to Range Officer on a weekly basis for onward submission to Deputy Directors and further analysis. Deputy Directors will carry out analysis of information with assistance of ACF, Biodiversity and maintenance of database and submit reports to the Field Director before 10th of every month. Field staff will be trained in recording observations, in M-STRiPES. Field gears/ equipment (binoculars, GPS, digital camera etc) will be provided to field staff. Field staff will generate tiger occupancy maps using daily monitoring data and submit report to DD's and FD for onward submission to NTCA every month.

- Tiger conservation managers require accurate and timely information on the occurrence, size and viability of populations.
- Tiger occurrence is mapped within a geographical information system (GIS as per phase-IV protocol.)

9.1.1 Duties of the Base Camp Watchers:

The primary duties of each base camp personnel are:

- Camping in the Tiger Reserve 24x7, which deters the poaching and smuggling attempts by offenders.

- Foot patrolling in all the trail paths, vulnerable routes, tiger dense areas, area with abundant herbivore population, along the streams.
- Checking all the water bodies and salt licks for presence of snares, traps, any suspicious change in colour and smell of water in the water bodies, other wildlife crime evidence etc.
- Checking of tiger kills, cattle kills, pugmarks, scrape, pellets, urine mark of Tiger and other carnivores and herbivores during foot patrolling.
- The places of evidence and GPS readings are entered in the base camp movement register.
- Night patrolling during full moon days and few days before and after full moon days and checking of vulnerable water bodies.
- Checking of agriculture lands and water bodies located adjoining the forest for presence of snares and traps.
- Controlling fire during the summer season.
- Recording GPS readings in track mode during foot patrolling and wildlife evidence collection.
- Checking the pedestrian pilgrims who are going to Srisailam temple during Mahashivarathri and Ugadi Festivals for weapons, inflammable materials, and other harmful articles.
- Preparation of Pug Impression Pads (PIPs) along the tiger tracks.
- Collection of the scats and signs of the carnivores.
- Collection of preybase information through pellets with GPS readings.
- Assist the Research Assistants for conducting research on tiger monitoring.
- Protection of the tiger habitat from fires, grazing, indiscriminate collection of NWFP, removal of non-degradable litter in peripheral zone.
- Cleaning saucer pits, tying saltlicks.
- Assist the staff in prevention of poaching and illicit fellings.
- Intelligent Patrolling using M-STrIPES and GPS.

The Range staff shall collect the information ad send soft / hard copies to the Conservator of Forests & Field Director and the Biodiversity Research Centre while submitting the copy of same data to the respective Deputy Directors, Project Tiger. The Beat and Range wise Tiger occurrence maps are being prepared using the data collected as above. The data shall also be analysed at Range Officers level monthly.

9.2.TIGER POPULATION ESTIMATION AND MONITORING FRAME WORK (PHASE I, II, III AND IV)

At present, monitoring is carried out as part of All India Tiger Estimation (AITE) as per NTCA guidlines once in four years and also by NSTR management annually (Phase IV monitoring).

MONITORING PROGRAMME BY NTCA

As part of the National Programme on 'Monitoring Tigers, Co-Predators, Prey and their Habitat', Goal of the programme is to collect systematic data on all aspects related to tiger conservation and collate the same for future analysis and monitoring at landscape level. A four-phase approach (Flow chart) is followed for the purpose.

- **Phase-I** - Spatial mapping and monitoring of tigers, co-predators, prey and habitat.
- **Phase-II** - Spatial and attribute data.
- **Phase-III** - Estimating the population of tigers, co-predators and its preybased on Phase- I and Phase II data.
- **Phase IV** - Intensive monitoring of source population.

Field Director provides training to the staff and compiles data collected by field staff. This monitoring will be continued as part of the National programme. In addition, Reserve management will carry out regular monitoring as detailed below:

9.2.1. Monitoring Programme by NSTR Management

Following NTCA guidelines, Field Director in consultation with Management has refined the monitoring protocol to suit the field conditions of NSTR. The entire exercise will be carried out using front-line staff and Tiger Monitoring Team with the supervision of Range Officer and DDs. Monitoring will be carried out as detailed below.

9.2.2.1 Carnivore Sign Survey

Carnivore sign survey will be carried out in each Section once a month in three different trails (trek paths or roads frequented by tigers). Minimum distance to be covered in a Section is 15 km. This information will help in understanding distribution and movement of tigers in different habitats/seasons and in deploying camera traps. Carnivore sign survey will be carried out based on protocol already established.

9.2.2.2 Estimation of Prey Population Using Line Transect Method

Prey population in each habitat will be monitored through line transect method. Direct sightings of animals in transects will be used for estimating population of prey species.

Transects will be laid in all the Sections and monitored twice a year following the protocol.

9.2.2.3 Estimation of Tiger Population Using Camera Trap Technique

Reserve will be divided into different blocks based on availability of camera traps and existing strength of Tiger Monitoring Team (TMT). Camera traps will be systematically deployed in the field based on carnivore sign survey.

TMT will be strengthened with additional manpower and infrastructure such as additional camera traps with accessories, solar panel with power source, field gears and transportation facilities. Timely procurement of stationary required for the exercise will be ensured for each sampling. Camp ration will be provided for TMT during their field work. Pillars will be used for fixing the cameras wherever necessary.

Sufficient copies of proforma in local language will be provided to the field staff.

9.3. Habitat Assessment and Monitoring Framework

Protocol provided in the field guide of NTCA for collecting information on habitat quality and impact of human indices will be used. Since no visible change can be observed in the habitat quality within a short duration, the data will be collected once in four years.

9.3.1. Protocol for Carnivore Sign Survey

- Sign Survey needs to be carried out in three different identified trails (trek paths, animal tracks, roads, etc.) once in a month.
- All the trails need to be surveyed during second week of month.
- A minimum of 15 Km length (in all trails put together) in each section needs to be covered during each sampling.
- Preferably 3 persons need to walk along the trail (One can observed in the front and other two can observe either side of the trail.)
- Search thoroughly on both sides of the trail for getting all indirect evidences.
- Walk silently during the survey.
- Observe the indirect evidences such as pugmark, scat, scrapes, scratches, kill and sound of animals such as tiger, leopard, wild dog and sloth bear.
- Every indirect sign should be noted properly with species name, type of sign, etc (as given in the data sheet) along with GPS location.
- Remove the indirect signs after recording to avoid repeated count during later survey.

- Signs that could not be identified correctly should not be recorded.
- Sighting of any pugmark of tiger and leopard along the trail should be marked using GPS location.
- The pre-fixed trails for sign survey only should be walked during the sampling period and should not alter the trail at any cost.
- The filled-up data sheets should be submitted by the section staff to the Range officer concerned immediately on returning to Headquarters.
- The Range Officer concerned should submit the data sheets after verification to the Deputy Directors for further analysis with the support of Field Director.

9.3.2. Protocol For Camera Trapping

- Select areas for deployment of camera traps based on sign survey being carried out every month using M-STrIPES and 8-day protocol along with camping sites
- Interval of two camera trap sites should be between 2 and 3 km. Standard grid of 2 km^2 shall be used.
- Overlay the trap sites on a map with grid well before and describe the area of the trapping team.
- Remember that camera traps should always be placed in pair.
- Camera should be placed at a height of 0.6-1 meter, not facing each other to get the photographs of both the flanks of individual captured.
- The cameras should necessarily be kept in iron case to prevent damage due to Wild animals trampling and tied in trees with belt and chain lock.
- The distance between the cameras deployed in pair should be with a distance of about 8-10 meters.
- The cameras should be kept for 40-45 days continuously in the same site for getting recapture of the tiger and leopard.
- A few cameras need to be kept in reserve for replacing cameras malfunctioning or damaged
- As soon as the team deploy the camera, they should take the GPS location of the site and communicate to the head quarter through wireless.
- Verify the location of the site from the GPS point on the map
- If any changes are needed in the location of the camera placed in the field, immediately inform the team to shift to the appropriate location
- The cameras should necessarily be inspected at least twice a week.

- After trapping occasions (After 45 days deployment) cameras to be brought back to the headquarters by the team.
- Process the images after downloading.
- Identify the photographs using the image library kept for reference.
- Prepare the capture history after completing the camera trap exercise throughout the Reserve.
- Analysis capture history using CAPTURE software for, population estimation.
- The following Base Camps / Patrolling Camps have been designated as the Head Quarter for the field level monitoring of M-STrIPES.

9.4. SPATIAL DATABASE DEVELOPMENT

Primary data collected from the field on tigers will be used for analyzing their spatial distribution. This will be correlated with details on co-predators, preybase, habitat quality and human indices. This will be further correlated with the information generated on vegetation cover, terrain model, drainage, transportation network, weather data, live- stock abundance, human density, socio-economic parameters etc for modelling habitat condition, tiger occupancy and potential areas of tiger for conservation.

Data generated at the Tiger Reserve level will be analyzed by Field staff once in four years. Infrastructure needed for generating such information, including the formation of a GIS unit and the procurement of digital data, will be developed in the Field Director's office under Project Tiger or other sources. The database on the territory of individual tigers and their identity will be kept strictly confidential.

9.5. ANALYSIS AND REPORTING FRAMEWORK

9.5.1. Analysis

Information generated from carnivore sign survey, camera trap method, PIPs, transects and daily monitoring during perambulation will be used for analysis of occupancy of tigers, co-predators and prey in different vegetation and terrain for preparing tiger occupancy maps.

Field staff will carry out statistical analysis of data using software's such as 'CAPTURE' and 'DISTANCE'. Spatial distribution, relative abundance and density of

tigers along with the habitat quality will be generated. This information can also be used to develop relationships for understanding tiger population dynamics.

9.5.2. Reporting

Reporting system for daily monitoring and implementation of tiger monitoring protocol are already explained in concerned sections. Reporting will be done as per the guidelines of NTCA. In addition, an annual status report based on the information generated will be prepared by Field staff and submitted to DDs, FD and CWW in July every year.

Technological innovations presently available could be used for storing the data at Section level and dissemination to headquarters using wireless local loop towers or internet. Necessary software and hardware will be provided. System can be updated with modern technologies.

9.5.3. Generation of Reports and Their Periodicity

M-STrIPES data from the mobile handsets will be compiled at division offices and transferred to Command Control Room, Field Director, who analyze the same and generate reports for management interventions. Reporting system for monitoring programme is given in Table 9.1

Reporting system of Tiger monitoring

S.No	Report	Forwarded to FD, PT	Compiled by FD, PT Submission to NTCA
1	Monthly monitoring report	Every month	Every month

9.5.4. Publication of Results

Output of the entire monitoring programme will be used to make necessary modifications in the management prescriptions within the Plan period. Information will also be published in peer reviewed journals and presented in seminars/symposia.

CHAPTER – 10

Protection and Intelligence Gathering



It is necessary to continuously guide and monitor the functioning of field officers and staff working in the Core Area of NSTR in respect to protection and intelligency gathering. This will be done by the State level and regional level Committees like the Tiger Cell – State level committee, Tiger Cell – Local monitoring committee and District Committee, monitoring cell and executive committee as described below.

10.1 THE TIGER CELL:

At State level, a Tiger Cell must be setup immediately to strengthen the enforcement as advised by the Tiger task force. The Tiger cell will have a two - tier arrangement; one is State level committee and the other is the regional committee.

Constitution of the State Level Committee:

- Chief Wildlife Warden, Andhra Pradesh, Mangalagiri : Chairman
- Field Director/ Conservator of Forests (Head Quarter) : Member Secretary
- All Deputy Directors / District Forest Offiers : Members
- Assistant Conservator of Forests, Biodiveraity : Member Convener

Tiger Cell shall be located in the O/o Principal Chief Conservator of Forests (Wildlife) & Chief Wildlife Warden, Aranya Bhavan, Andhra Pradesh, Mangalagiri, Guntur District.

(A) The Mandate of State Level Committee:

a. Develop a data base of wildlife crime to enable co-ordination, to be able to pursue important cases and follow up with investigative agencies like Central Bureau of Investigation (CBI) on the investigation as well as the conviction of large organized crime networks.

b. The State Level Committee shall give certain tasks to Central Bureau of Investigation (CBI) for investigation of Wildlife crime networks and to work closely with Wildlife Crime Control Bureau, so that it can find synergies in combating crimes especially the organized poaching cases.

c. The Wildlife Crime Control Bureau (WCCB) shall be requested to take the lead in organizing training programmes for the local police and forest staff to ensure greater vigilance with the help of the specialized institutions.

(B) There are two Regional Committees - Local Monitoring Committee and the other is the Regional / District Committee.

a. ***Local Monitoring Committee***: The duties of this committee shall be to:

- Convey the progress to FD / DFOs on a daily basis through wireless
- Can deviate from routine schedule during emergencies
- Take note of offences registered in local Police Station
- Use certain instruments like Tape Recorder / Camera etc. to record the evidences of the crime.

b. ***Constitution of Regional Setup:***

Monitoring Cell: -

- Deputy Inspector General of Police / Inspector General of concerned Range : Chairman
- Field Director / Conservator of Forests : Co-Chairman

Executive Committee:

- Collector / Superintendent of Police : Member
- Territorial and Wildlife Divisional Forest Officers : Convener

Responsibilities / Working:

a) *State Level Committee shall focus on*

- Coordination
- Monitoring progress
- Advisory role
- Suggesting amendments
- Convening meetings
- Securing financial assistance
- Identifying sensitive areas

b) *Monitoring Committee shall focus on*

- Convening review meetings
- Ensuring efficient functioning of execution committees
- Ensuring enquiry of complaints
- Submission of monthly reports
- Ensuring awards/ rewards

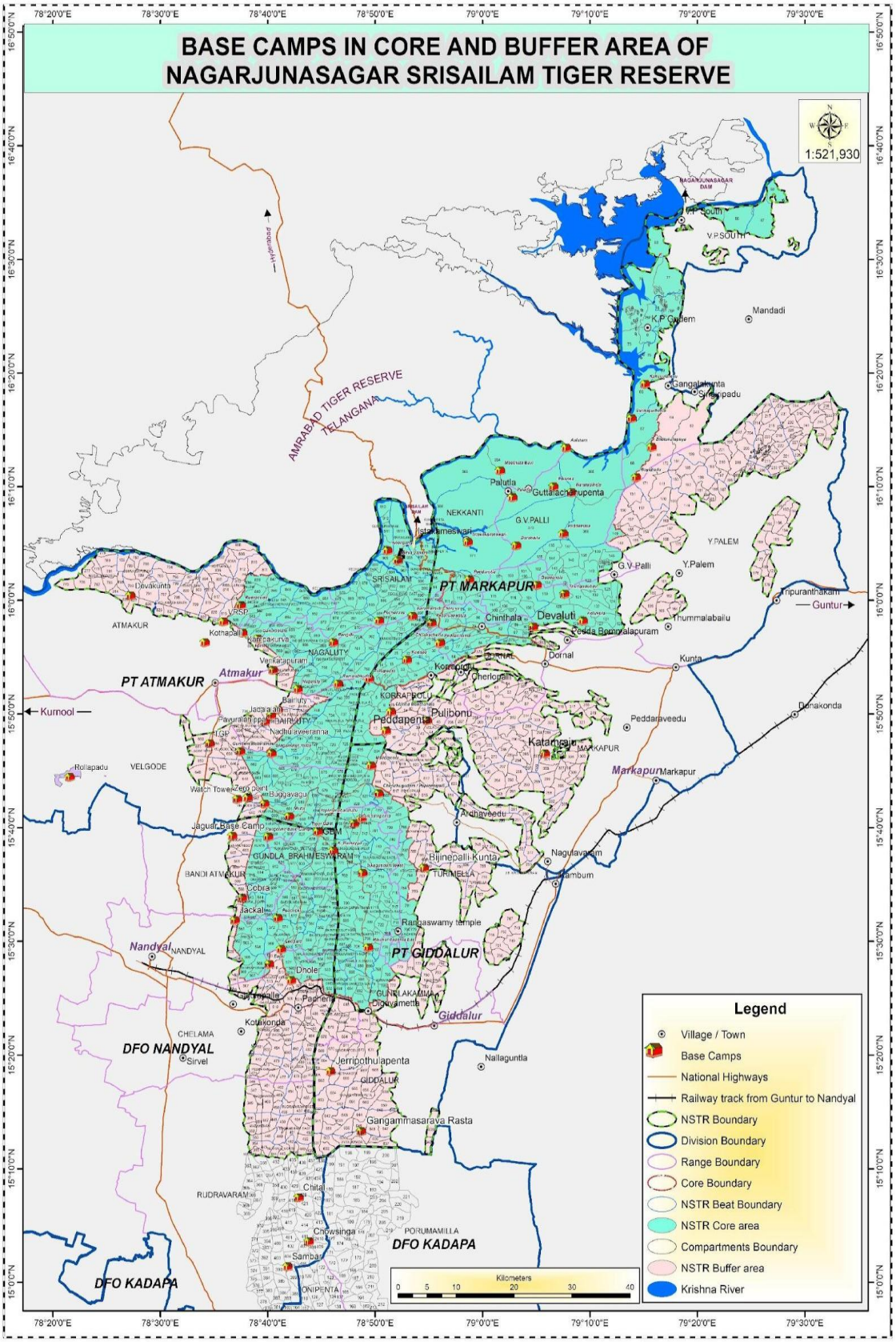
c) *Execution Committee shall focus on*

- Evaluating gravity of the situation
- Ensuring / Expediting prosecution under WLP Act,
- Networking / Information gathering

10.2 THE STRIKE FORCE:

Intelligence gathering and anti-poaching activities are the important functions of the Tiger Reserve Management. The Strike Force/Anti-Poaching Squads are utilized for intelligence gathering and anti-poaching activities. 87 nos. anti-poaching camps are organized in NSTR including the core as well as buffer area. Different activities like intelligence gathering, vehicular patrolling, river patrolling, foot patrolling, other protection measures, development of inspection huts for monitoring which are taken at present and to be continued in the core area are described below.

Map:54 Showing the Base Camps in Core and Buffer Area of NSTR



10.2.1 The Strike Force / Anti-Poaching Squads (APS):

Anti-Poaching Squad (APS) shall focus on:

- Intelligence networking
- Information gathering
- Strategy and preparation of site-specific action plan
- Coordination with territorial staff and forest development corporation
- Eliciting public support for conservation

Anti-Poaching Squad (A.P.S.) Requirement: -

- Training in information gathering / Networking to squad staff
- Need for (per Squad):
  - Protection Watchers (5 Nos.)
  - Gypsy (1)
  - Wireless (1 Vehicular and 1 Hand set)
  - Other Accessories: Torch, Search light, Binoculars, Tape recorder, Camera, Video camera.

10.2.2. Anti-poaching measures:

- Regular maintenance of wireless systems has to be done.
- Shifting of patrolling camp watchers among different camps regularly to be done.
- Continuous regular training to staff and protection watchers to be organised

10.2.3. Protection Initiatives:

There are 75 patrolling camps in Nagarjunasagar Srisailam Tiger Reserve. The location and strength of each base camp may be reviewed periodically.

(1) In addition to exsiting camps, each division shall consider establishing patrolling camps at the sensitive points in the Tiger reserve, so that each patrolling camp has, on an average, an area of 25-30 sq. km. under its jurisdiction to ensure the desired amount of legwork by beat guards and his camp followers posted in such patrolling camps.

(2) Each division shall prescribe a daily schedule of patrolling keeping in mind the vulnerability of the area from protection point of view.

(3) Maintain a monitoring/daily observation register in each patrolling camp in Telugu, in which the field personnel can record their daily observations based on patrolling.

(4) FROs shall keep a record of the local village level market days (Sandhis) in the peripheral areas, and deploy staff in civil dress to keep track of any untoward incident/transaction relating to wildlife.

(5) Organize vehicular patrolling by day and night constituting squads comprising of field staff, labourers with wireless handset and paraphernalia for apprehending offenders as follows.

(6) Maintain a list of vehicles passing through manned barriers, and surprise checks by senior officers at such points in every month.

(7) At division level establish a monitoring system for collation of information regarding livestock depredation/human injury/loss of human life/large scale crop depredation by wild animals through wireless and prompt payment of compensation.

(8) Wherever half eaten carcasses of livestock on account of carnivore depredation are reported, assist the concerned in submission of certificates required and arrange immediate compensation to the owner to avoid the possibility of poisoning.

(9) In areas where more than three incidents of livestock de-predation are reported within a fortnight, continuous monitoring based on field evidences should be done by deploying trackers.

(10) Ensure periodic monthly meetings with the neighboring district/divisional officials for exchanging wildlife crime dossiers to facilitate joint action.

(11) Divisional Forest Officers shall organize quarterly review meetings with the Superintendent of Police to exchange of crime dossiers with local police and facilitate updation.

(12) Divisional Forest Officers shall ensure periodical meetings with the District Judge / Judicial Magistrates to expedite the disposal of pending cases relating to wildlife offences.

(13) Organize surprise raids at bus-stops, buses, Dhabas and cafeteria for meat of wildlife.

(14) The area should be constantly monitored to ascertain the presence of gangs and wandering pastoral people, apart from keeping an inventory of their temporary settlements.

(15) Open a village level Crime Register and maintain at the EDC level to keep track of villagers involved in wildlife offences.

(16) At the range level, dossiers of perpetual offenders should be maintained, which may help in tracing new crimes to old offenders.

(17) Identify pro-active local persons and imparting them the basics of wildlife crime detection so as to avail their services as and when required as informers.

(18) Prepare a monthly crime map of each range on a 1:2,50,000 scales indicating the locations of each crime with date. It should also highlight the recorded cases of livestock depredation by carnivores during the period.

(19) Patrolling camp staff should be instructed to collect field evidences like pugmarks, plaster cast of foot-prints on a regular basis, so that individual identities of carnivores like Tiger can be fixed. This would serve as a continuous monitoring also.

(20) Lay out impression pads near water points to ascertain the presence of carnivores in the area.

(21) Constitute Defense Squads comprising of local, pro-active villagers at the EDC level, which can assist the PA staff in apprehending miscreants involved in wildlife poaching.

(22) Provide tape recorder/camera to each of the patrolling camps to record evidences.

(23) Ensure registration of fire arm license holders as per the directives of the Hon'ble Apex Court.

(24) Organize periodical trainings for crime investigation and prevention of crime.

10.3. STRATEGY FOR PROTECTION AND COMMUNICATION:

The idea of establishing forest camps is for using strategic force instead of a large force. This demands two things: (1) An effective deployment of personnel and (2) More efficient use of existing machinery and infrastructure.

- There is a need to invest in basic facilities for the frontline staff like housing camps with free rations.
- Create staff welfare fund out of the income from tourism which can be used to supplement medical and other benefits for the staff.

Special Protection measures to be undertaken:

- Foot patrolling distance for staff is to be:
    - ♦ Base Camp Protection Watchers (5 km/day) along with FBO, ABO/FSO.
    - ♦ Range staff (100 Km/Month)
    - ♦ Range Officer (80 Km/Month)
    - ♦ Route chart shall clearly be defined
    - ♦ Staff / camps listed with duty allocation
    - ♦ Fire Arms /Mobile wireless sets to be provided
    - ♦ Foot Patrolling Squads

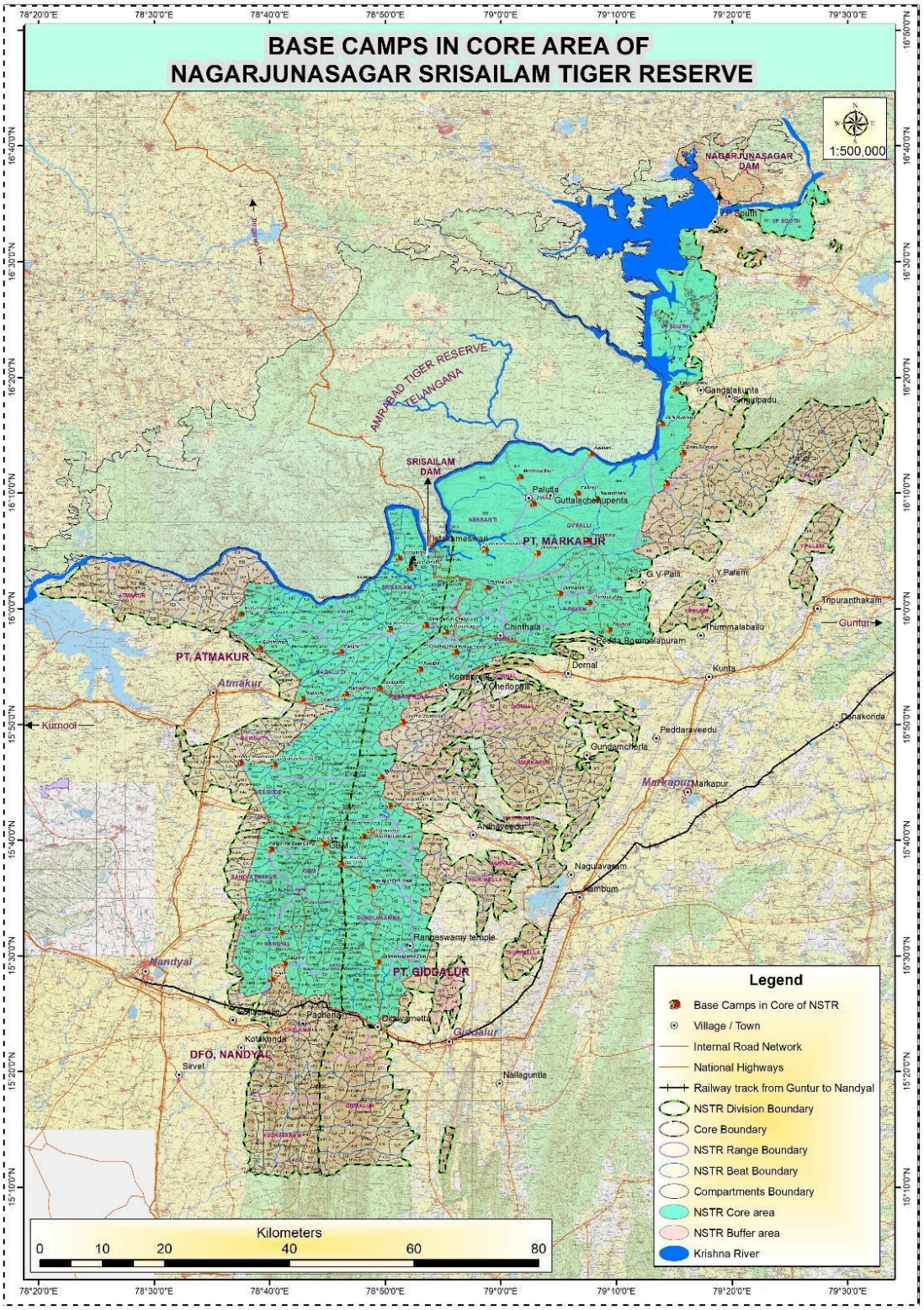
Table 45: Patrolling Anti-poaching camps (APC) / Base Camps located in NSTR

Sl No	Division	Range	Beat	Name of the Base camp	Latitude	Longitude
1	Atmakur	Bairluty	Kurutla Penta	Ramaiah Kunta	15.87725	78.77665
2	Atmakur	Nagaluty	Nagaluty	Woods Teak Plantation	15.86927	78.71303
3	Atmakur	Nagaluty	Pangidi West	Pangidi	15.93272	78.7769
4	Atmakur	Nagaluty	Indireswaram West	Gummitham	15.94331	78.65078
5	Atmakur	Srisailam	Pecheruvu East	Pecheruvu	15.97004	78.83885
6	Atmakur	Srisailam	Pecheruvu West	Naramamidi Cheruvu	15.97573	78.89259
7	Atmakur	Srisailam	Sundipenta	Bilva Vanam	16.05806	78.8678
8	Atmakur	Srisailam	Srisailam	Neeliganga	16.07258	78.85219
9	Atmakur	Velgode	Velgode North	Gundem Mallelamma	15.77786	78.62367
10	Atmakur	Velgode	Velgode North	Lingamaiah mitta	15.7752	78.6722
11	Atmakur	Velgode	A.Kunta	Motta	15.68287	78.69949
12	Atmakur	Velgode	GBM West	GBM	15.66051	78.74441
13	Giddalur	Gundlakamma	Malakondapenta (E)	Malakondapenta	15.49068	78.82194
14	Giddalur	Gundlakamma	Isukagundam (E)	Isukagundam	15.59951	78.81325
15	Giddalur	Gundlakamma	Obulesunipenta	Obulesunipenta	15.67212	78.80035
16	Giddalur	Gundlakamma	Ambavaram	Ootla	15.46302	78.85461
17	Giddalur	Turimella	Papinenipalli	Chenchugudem	15.71628	78.83832
18	Giddalur	Turimella	Papinenipalli	Yepimanu barakalu	15.68017	78.81205
19	Giddalur	Turimella	Maddipenta	Maddipenta	15.7573	78.82616
20	Markapur	Dornal	Thummalabailu	Peddachama	15.936599	78.932837
21	Markapur	Dornal	Thummalabailu	Eco-Tourism	15.977755	78.934126
22	Markapur	Dornal	Thummalabailu	Yedurupadiya	15.96611	78.92018
23	Markapur	G.V.Palli	G.V.Palli	Peddamma	16.09733	79.12468
24	Markapur	G.V.Palli	Burugundala	Naratadikela	16.15762	79.13728
25	Markapur	G.V.Palli	Palutla	Palutla	16.150465	79.04561
26	Markapur	G.V.Palli	Palutla	Palanka	16.16632	79.1095
27	Markapur	G.V.Palli	Regumanupenta	Darabailu	16.07992	79.05179
28	Markapur	Korraprolu	Peddachama	Kudupa	15.91242	78.88201
29	Markapur	Korraprolu	Ch.Manthanala	Ch.Manthanala	15.8361	78.857245
30	Markapur	Korraprolu	P.manthanala	Rollapenta	15.8848	78.82358
31	Markapur	Nekkanti	Nekkanti	Istakameswari	16.084802	78.976918
32	Markapur	Nekkanti	Guttalachenu	Meethotabavi	16.18992	79.02664
33	Markapur	Nekkanti	Chinnarutla	Peddarutla	16.02997	78.978992
34	Markapur	Nekkanti	Guttalachenu	Aalatam	16.221742	79.106933

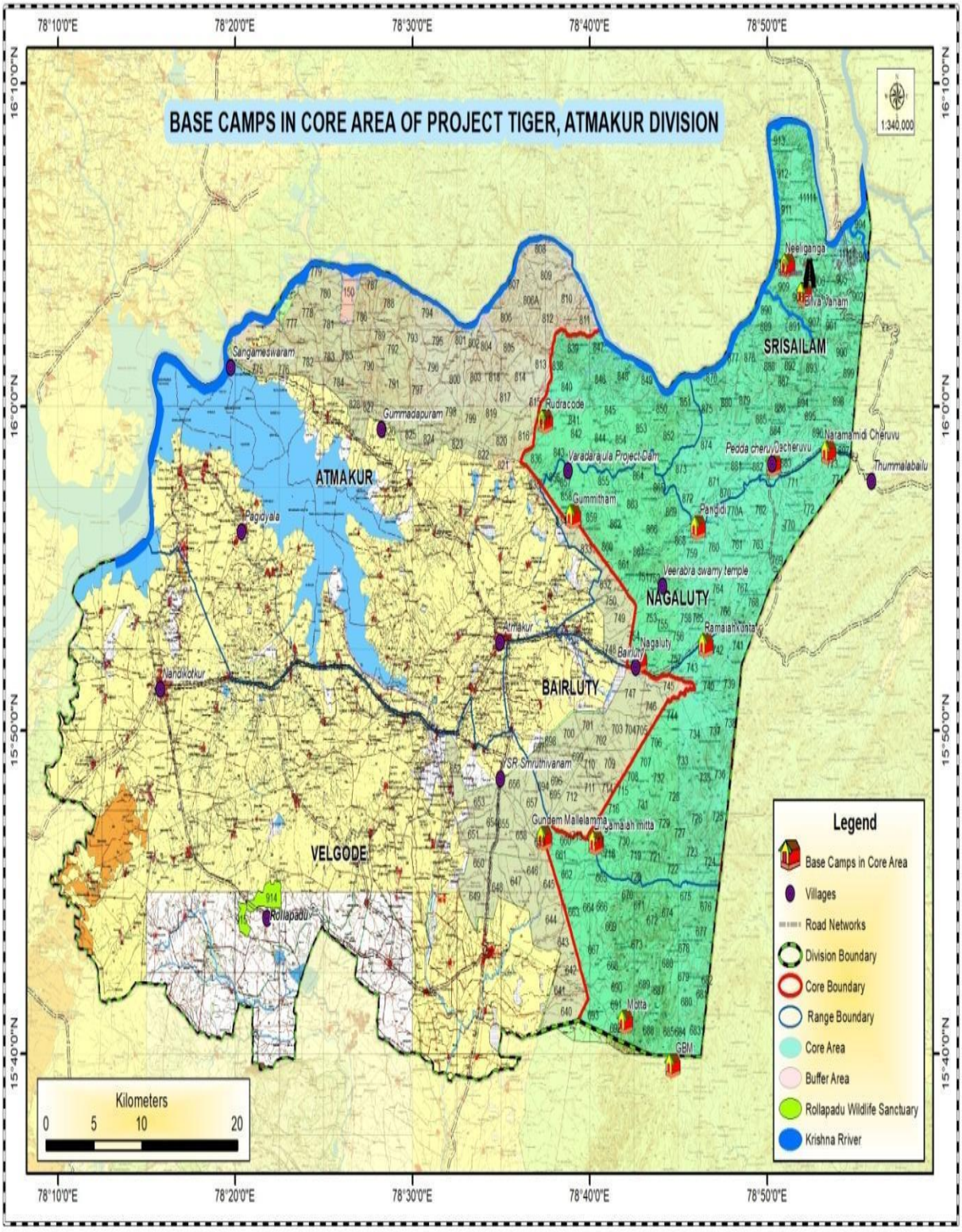
35	Markapur	Nekkanti	Nekkanti	Gangaram Penta	16.120238	78.99119
36	Markapur	V.P.South	Gangalakunta	Bhatukulapaya	16.224061	79.261224
37	Markapur	V.P.South	Gangalakunta	Bhatukulapaya	16.268742	79.227901
38	Markapur	V.P.South	Gottipalla	Kaduvula Revu	16.31454	79.2466
39	Markapur	V.P.South	Sirigiripadu	Boyapadu	16.179827	79.237777
40	Markapur	Y.Palem	kolukula	Thungudubavi	15.969371	79.155099
41	Markapur	Y.Palem	T.R.Cheruvu	Daddanala	16.021611	79.083999
42	Markapur	Y.Palem	Kolukula	Kolukula	16.008705	79.126506
43	Nandyal	Bandi Atmakur	Narapureddy_Kunta_N	Pangolin	15.65265	78.66691
44	Nandyal	Chelama	Basavapuram	Eagle	15.46608	78.66842
45	Nandyal	GBM	Ramannapenta West	Tiger	15.66037	78.74392
46	Nandyal	GBM	Ramannapenta East	Honey badger	15.60941	78.73634
47	Nandyal	Nandyal	Palardam	Leopard	15.48803	78.68677
48	Nandyal	Nandyal	Gadigundam	Peacock	15.53348	78.68176
BUFFER AREA BASE CAMPS IN NSTR						
49	Atmakur	Atmakur	Kothapalli	Kothapalli	15.96995	78.54703
50	Atmakur	Atmakur	Palem	VRSP	15.95182	78.61345
51	Atmakur	Atmakur	Atmakur	Sadaram Penta	15.99692	78.61212
52	Atmakur	Atmakur	Gummadapuram	Dova Kunta	16.00659	78.45331
53	Atmakur	Bairluty	Bairluty	Bairluty	15.83928	78.68151
54	Atmakur	Bairluty	Rudracode	Rudracode	15.79226	78.62435
55	Atmakur	Bairluty	Nallakalva	Jadalaiah rastha	15.82539	78.62582
56	Atmakur	Bairluty	Pasurutla	Nandula Veeranna	15.82158	78.66218
57	Atmakur	Bairluty	P.A.Puram North	Pavuralla thippa	15.83102	78.67146
58	Atmakur	Nagaluty	Venkatapuram	Kasaiah Bavi	15.89726	78.67439
59	Atmakur	Nagaluty	Indireswaram East	Kampa Kuruva	15.95175	78.62711
60	Atmakur	Nagaluty	Indireswaram West	Aamalapuram dongu	15.90275	78.6674
61	Atmakur	Velgode	Velgode South	Watch Tower	15.70819	78.61912
62	Atmakur	Velgode	Pangidi	Zero point	15.71023	78.63503
63	Atmakur	Velgode	A.Kunta	Buggavagu	15.70125	78.66131
64	Atmakur	Velgode	Velgode West	TGP	15.78975	78.57621
65	Giddalur	Giddalur	Uyyalawada	Gangamma sarava	15.2211	78.81106
66	Giddalur	Giddalur	Kothakota	Jerripotula penta	15.3088	78.76325
67	Giddalur	Giddalur	Bodi	Bodi bodi	15.23857	78.81787
68	Giddalur	Turimella	J.P.Cheruvu	Bijinepalli kunta	15.6072	78.90838
69	Markapur	Dornal	Chilakacherla	Chilakacherlagudem	15.87136	79.00224
70	Markapur	Dornal	Bommalapuram	Devaluti	15.9607	79.07788
71	Markapur	Dornal	Chilakacherla	Chilakacherla	15.909378	78.994077

72	Markapur	Korraprolu	Y.Cherlopalli	Pulibonu	15.82328	78.9132
73	Markapur	Korraprolu	Ch.Manthanala	Peddapenta	15.80774	78.84942
74	Markapur	Korraprolu	Nallaguntla	Kodi kurava	15.867101	78.93604
75	Markapur	Markapur	Gundamcherla	Puliraju Thippa	15.774869	79.096097
76	Markapur	Markapur	Kalanuthala	Gandi bodu	15.84598	79.09933
77	Markapur	V.P.South	Sirigiripadu	Kanutulasela	16.221903	79.312827
78	Markapur	Y.Palem	Akkapalem	Akkapalem	16.251135	79.481463
79	Nandyal	Bandi Atmakur	Narapureddy_Kunta_S	Jaguar	15.65383	78.6113
80	Nandyal	Bandi Atmakur	onkaram South	Cobra	15.56301	78.62618
81	Nandyal	Chelama	Chelama	Dhole	15.44225	78.70265
82	Nandyal	Nandyal	Prema	Jackal	15.53042	78.61529
BASE CAMPS OUTSIDE NSTR AREA						
83	Atmakur	Velgode	Rollapadu	Rollapadu	15.73866	78.36515
84	Giddalur	Bestavaripeta	Allinagaram	Allinagaram	15.17833	79.05365
85	Nandyal	Rudravaram	Ahobilam_South	Chital	15.124	78.7131
86	Nandyal	Rudravaram	Utla	Chowsinga	15.05929	78.72995
87	Nandyal	Rudravaram	DV Penta	Sambar	15.02365	78.69662

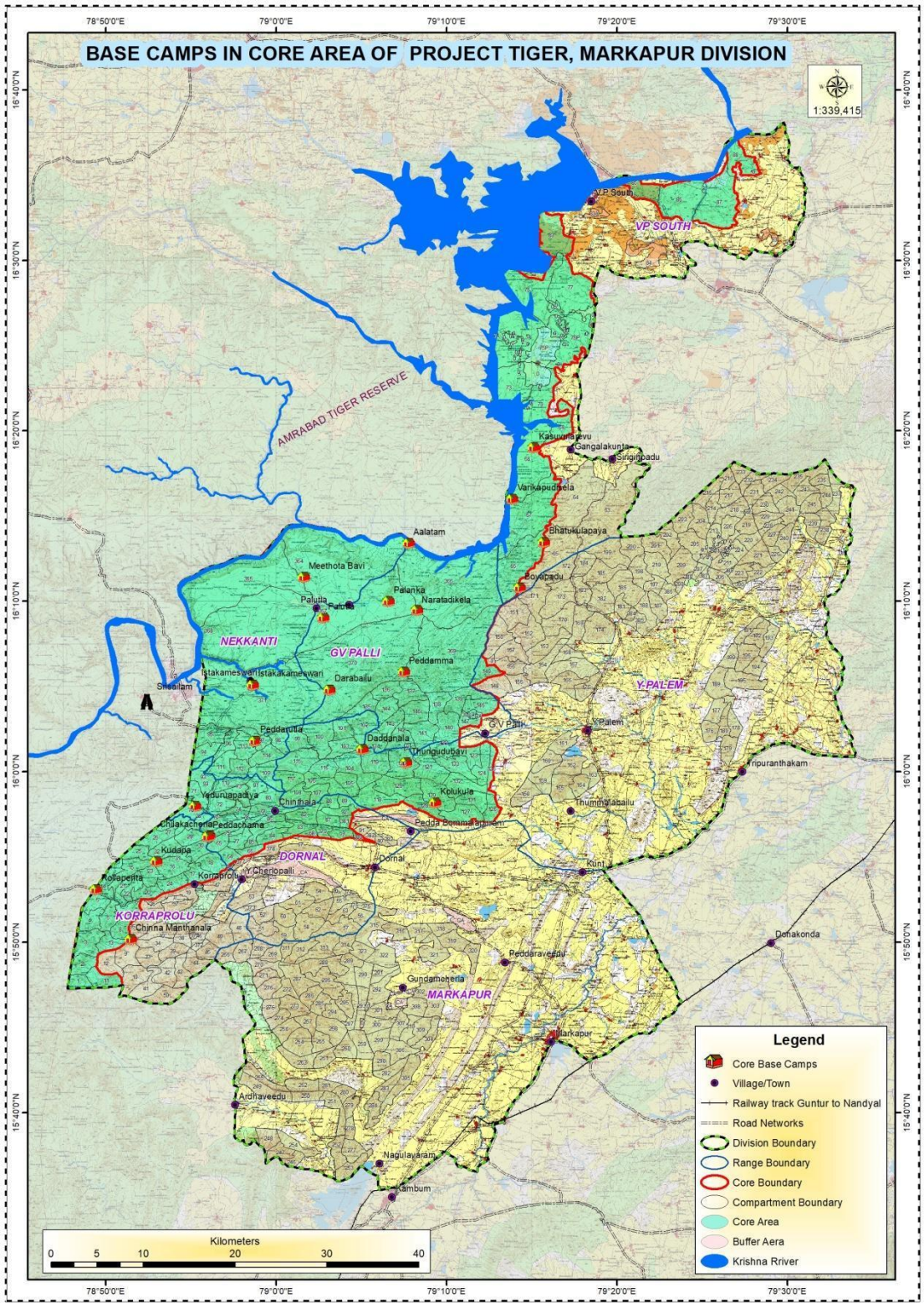
Map 55: - Map showing Base Camps in Core area of NSTR



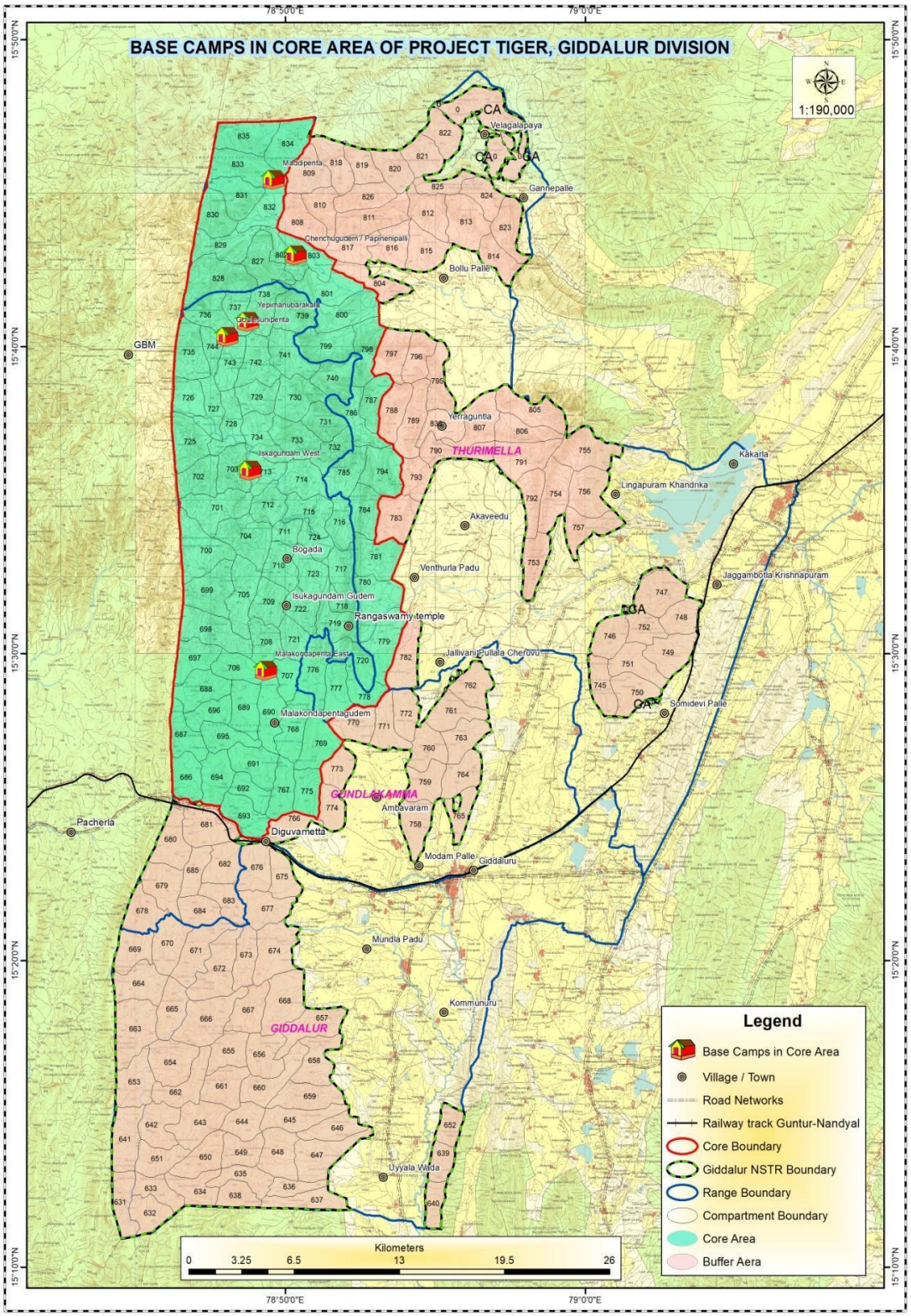
Map- 55(a): Base Camps in Atmakur Division



Map- 55(b): Base Camps in Markapur Division



Map- 55(c): Base Camps in Giddalur Division



Map- 55(d): Base Camps in Project Tiger, Nandyal

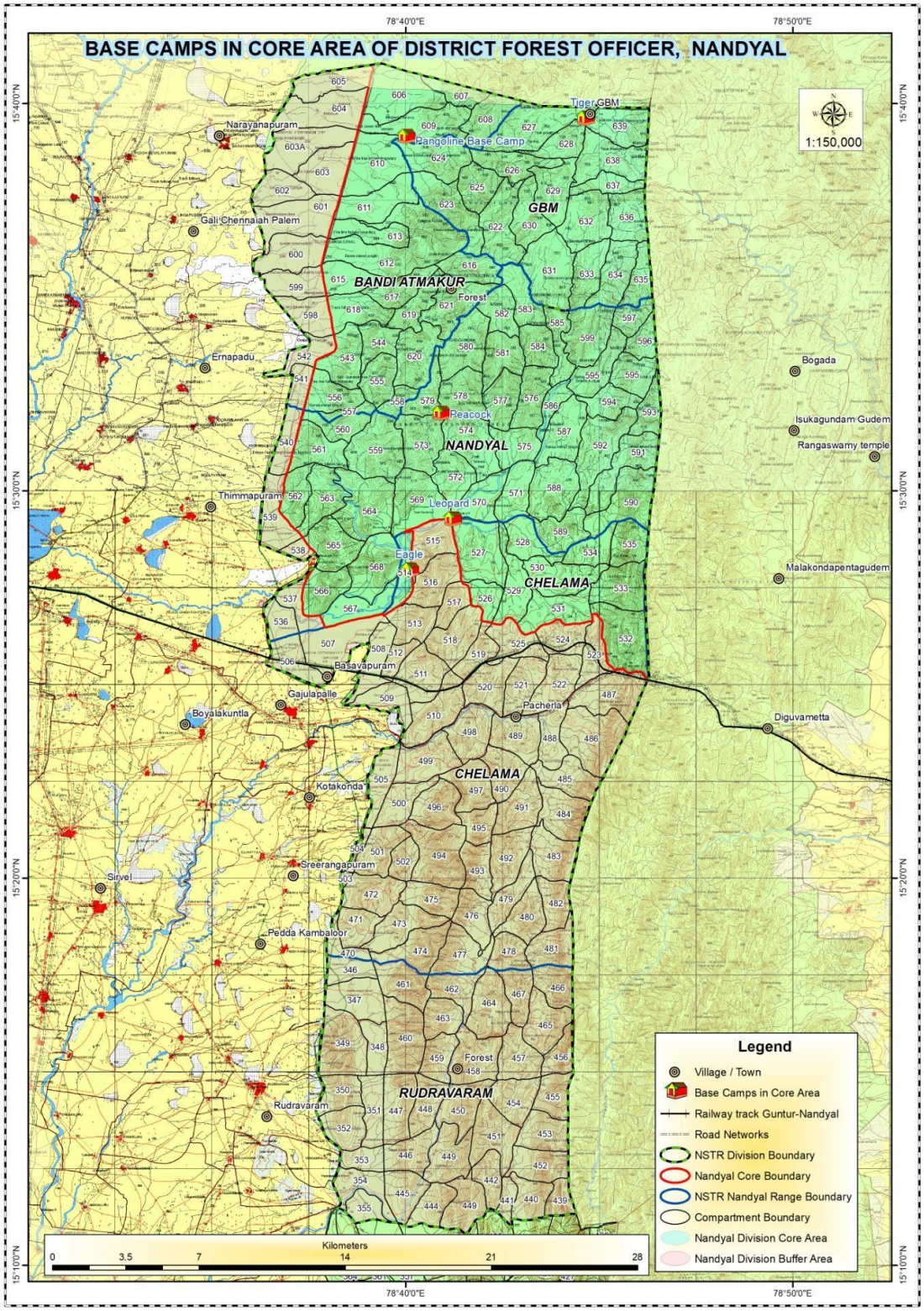


Table 46: Division-wise vehicular patrolling parties and the routes.

Sl. No.	Division	Patrolling party	Patrolling route
1	Atmakur	1) Peddacheruvu	1) Pedda Cheruvu – Thumalbailu 2) Peddacheruvu – Rollapenta 3) Peddacheruvu – Naramamidi cheruvu
		2) Bairluty	1) Bairluty – Ramaiahkunta 2) Bairluty – Muskumbavi- Pachikalva 3) Bairluty – Nagaluty temple 4) Bairluty – Rollapenta
		3) Kottalacheruvu	1) Kottalacheruvu- G.Kuruva 2) VRSP - Chinnagumitham 3) Peddagummitham - Velagala kunta
		4) Sundipenta	1) Sundipenta – Dornala 2) Sundipenta – Srisailam dam 3) Sundipenta – Srisailam
		5) Velugodu	1) Zero point – Gundla Brahmeswaram
2	Markapur	7) Dornala	1) Dornala – Sikharam 2) Dornala – Rollapenta
		8) Y. Palem	1) Y.Palem – G.V.Palli – Palutla 2) Y. Palem – Davupalli
		9) Korraprolu	1)Chinnamanthanala – Gundla Brahmeswaram
		10) Sirigiripadu	1) Sirigiripadu – Yetthipothala 2) Sirigiripadu – Jandapenta 3) Sirigiripadu – Davupalli
3	Nandyal	11) Bandi Atmakur 12) Nandyal Range 13) Chelama	1) Narayanpur- Motta 2) Gundla Brahmeswaram – Chalama 3) Mahanandi to Krishna nandi near TGP Canal 4) Dhole Base Camp to Burgumanu Rasta
4	Giddalur	14) Gundlakamma	1) Digumetta – Gundla Brahmeswaram 2) Chinnamanthanala-Maddipenta- Gundla Brahmeswaram

While situations in field units would vary necessitating site-specific strategy, the success of wildlife protection and crime risk management depends on good surveillance, timely reporting and networking, prompt situation analysis and immediate action. The detailed security plan shall be prepared separately by each division.

Creation of patrolling camps at sensitive points with deployment of staff/labour is required. It is the duty of the team leader of the camp for implementation of the following tasks.

1. Listing of Staff/Camps with duty allocation and route chart.
2. Appropriately equipping the patrolling team with fire arms and mobile wireless sets.
3. Special instructions to squads/parties covering several aspects viz.,
    - Surveillance of hotels, tourist points, vehicles, bus stand
    - Surveillance of traditional hunters etc.
    - Co-ordination with local police

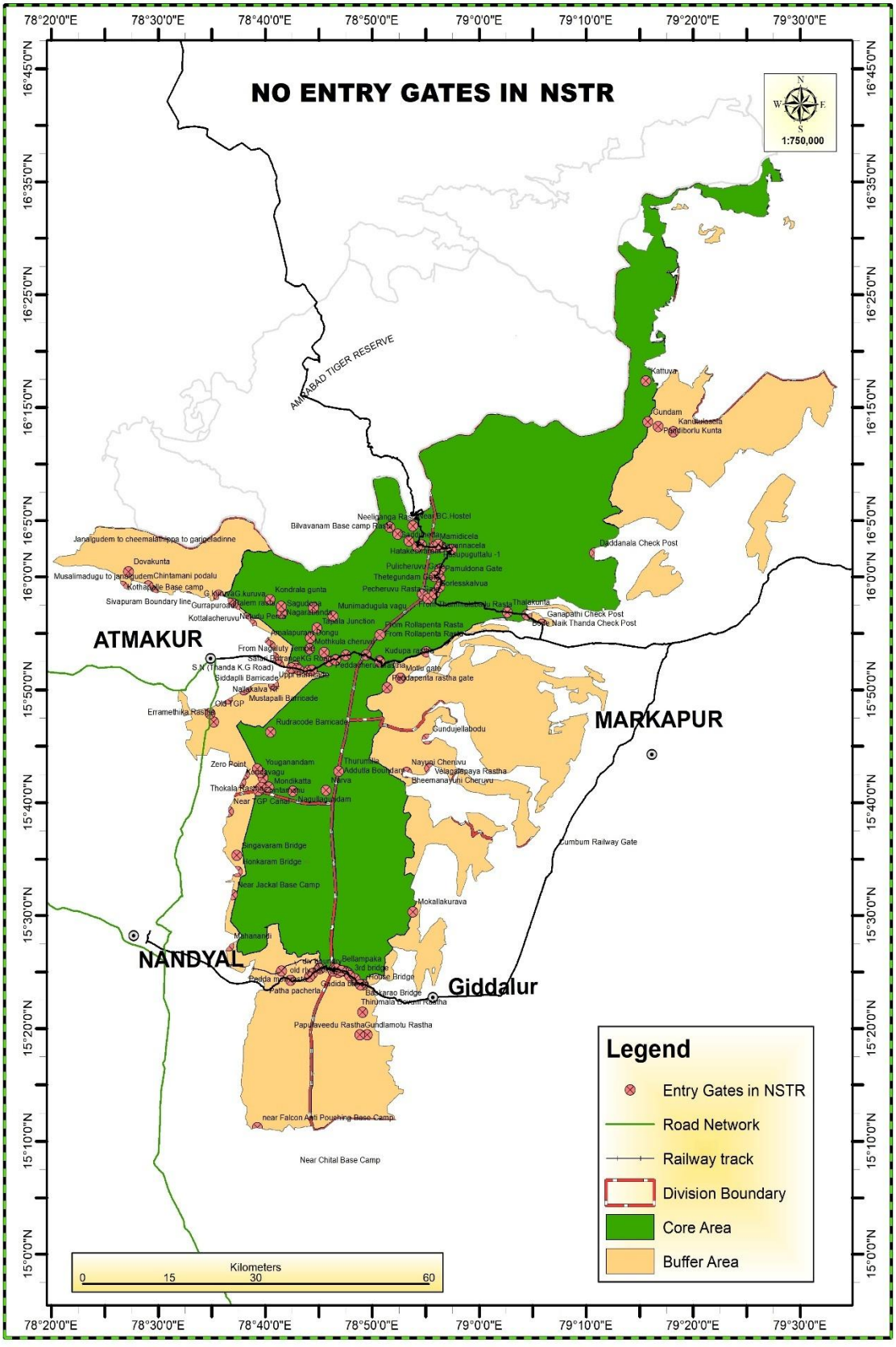
- Networking
- Issue of Special 'Preliminary Offence Report' books
- Preparation of daily schedule
- Local country side market checking
- Surprise checking of barriers.
- Preparation of monthly wildlife "crime maps" (preferably in the GIS domain using GPS or on a 1:50,000 scale map)
- Monitoring cattle kill, human kill, injury
- Monitoring water points near habitation
- Preparation of crime gang dossiers.
- Monitoring/updating at the level of Field Director/Dy. Director through wireless.
- Maintenance of 'village level' crime registers through village committees.
- Taking note of offences registered in local police station.
- Using tape recorder/camera to record evidences.
- Registration of fire arm license holders as per the directives of the Hon'ble Apex Court.

This plan recommends improve the check posts and erecting no entry gates and barricades especially the roads leading to the potential Tiger habitats as shown in the following table.

Table 47:- Establishment of No Entry gates in Core Area of NSTR

Sl. No.	Location	Range
1	Nekkanti Road	G.V.Pally
2	Peddarutla Road	Yerragondapalem
3	Thummalabailu Pecheruvu Road	Srisailam / Dornal
4	Chintala – Chama Road	Dornal
5	Rollapenta – Peddacheruvu Road	Nagaluty/Dornala
6	GV Pally – Y. Palem Road	Yerragundapalem
7	Bakkachinthala Penta	G.V.Palli
8	Eetipaya rastha	Korraprolu
	Nallamadugu vagu rastha	

Map 56: Showing the No Entry Gates in NSTR



The following vulnerable sites have been identified for the deployment of Anti-poaching squads at sensitive places subjected to Illicit grazing and Felling of trees.

- Footpaths/bridal paths linking Tiger Reserve to outside
- Natural salt licks
- Habitat close to electric transmission lines
- Habitat close to human settlement and monsoon cattle influx

Table 48: List of Areas Vulnerable for Poaching attempts in core area of NSTR

District	Vulnerable areas
Palnadu	1. Davupalli, 2. Bothukulapaya
Prakasam	1. Gurrapusala, 2. Bommalapuram, 3. Cherlopalli, 4. Chama valley, 5. Panthanala, 6. Chinnarutla, 7.Ayyannakunta
Nandyal	1. Bairluty 2. Indireswaram 3. Guvvalakuntla 4. Srisailam

The river Krishna flows along the Tiger reserve for 200 Kms.

10.3.1. Formation of patrolling parties:

Table 49: Proposed patrolling parties for River Krishna

Sl.No.	Division	Range	Patrolling Party
1	Markapr	Nekkanti	Nekknti
2	Markapur	VP South	Anupu
3	Atmakur	Srisailam	Lingalagattu

Four land patrolling parties and Four river patrolling parties shall be constituted at Macherla, Dornal and Atmakur. The headquarters for river cruising parties shall be at Srisailam. Each of these shall patrol along the river Krishna, one on upstream and the other on down-stream side. Each land party shall consist of one Range Officer, one Forester, and 5 Forest Guards with arms. Each party will have an independent vehicle (van or jeep) fitted with wireless.

10.3.2. Prevention of smuggling by river party patrolling:

All round the year, patrolling by boat in upstream with Atmakur river patrolling party and downstream by Markapur river patrolling party of River Krishna to be strengthened by increasing the number of boat patrolling parties from four to six.

Vulnerable spots are to be identified based on the past crime/offence data and suitable measures to be put in place. They will control timber smuggling and illegal fishing.

10.3.3. Night patrolling:

Based on the information available and the critical period between November to April overlapping with the fire season striking force will organize the night patrolling in the border areas of Tiger Reserve. Suitable timely modifications will be worked out at the filed level by involving the Deputy Directors/ Assistant Conservator of Forests/ Forest Range Officers.

10.3.4 Security:

In addition to this, it is necessary to ensure security for the visitors and other people living in sanctuary from the wildlife. Further the public properties such as tourist complexes, offices, check posts, wireless installations, recreation centers etc., are to be protected by the forest staff.

10.3.5. Vehicles:

All the Forest Range Officers are given new utility vehicles for effective control over the possible threats and offences. As it needs frequent patrolling in the sanctuary, there shall not be a restriction on use of fuel.

10.3.6. Arms and Ammunition:

All the patrol parties need to be equipped with arms and ammunition. Each forester in the party to be supplied one rifle or double barrel gun and the Forest Range Officers to be given a pistol each. The necessary ammunition also is to be purchased and account to be maintained consciously.

10.3.7. Check posts:

At present the following thirteen check posts are under operation (Table-51). All the check posts are on the highway and round the clock attention is ensured. The movement of vehicular traffic is prohibited, between 9PM to 6AM and the same *status-quo* shall be maintained. Heavy vehicle traffic on Srisailam – Dornal road is prohibited from 6P.M. to 6A.M. However, all medical emergency cases and the staff on official duty are permitted during these hours.

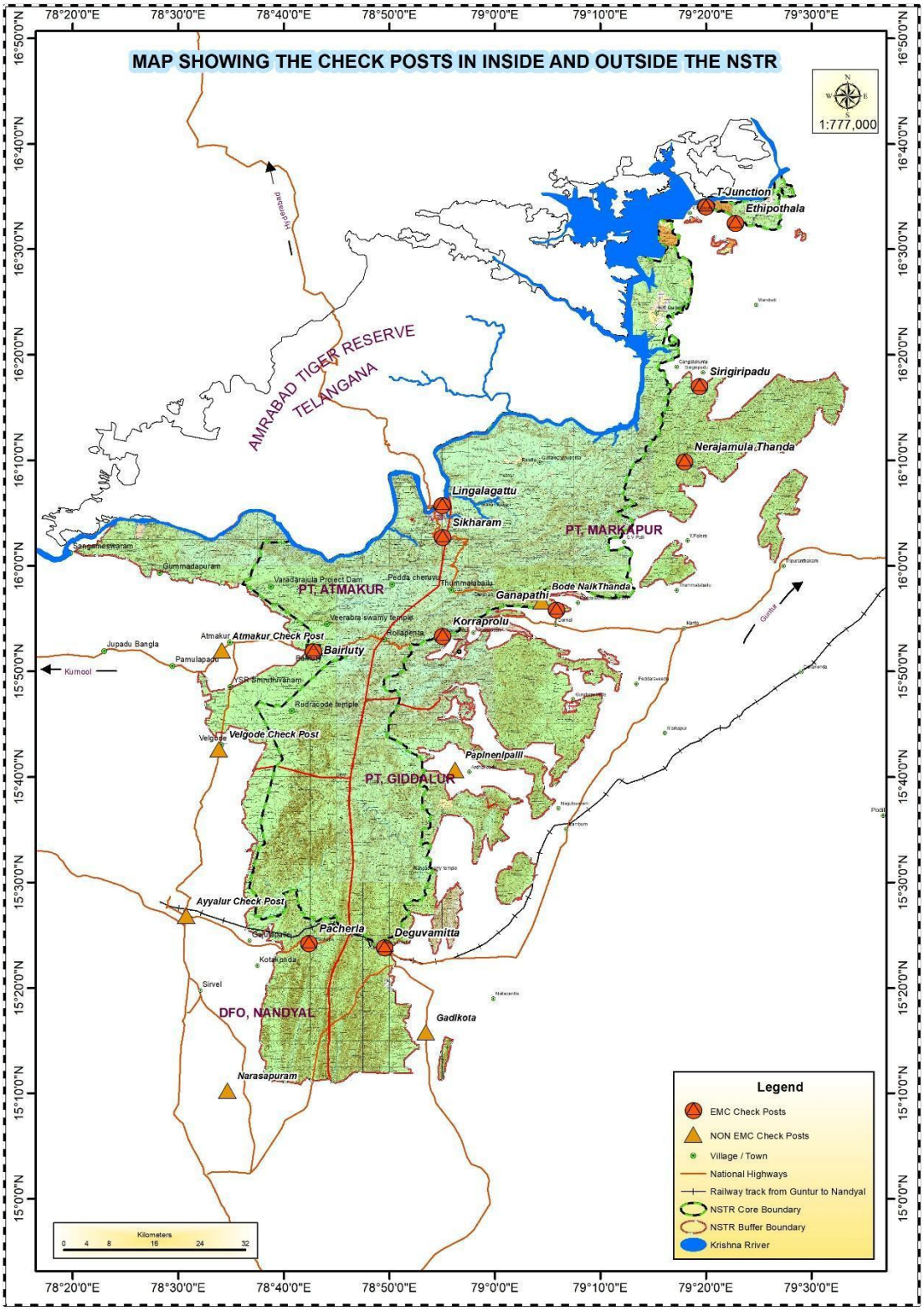
The Govt. as per G.O Ms. No.56, Environment, Forests, Science & Technology (For-II) Department, Government of Andhra Pradesh, dt.28.05.2014 **(**Annexure-XIII) have permitted the setting up of check posts for collection of Environmental Maintenance Charges (EMC) from the vehicles passing through Nagarjunasagar Srisailam Tiger Reserve. All the revenue collected from EMC check posts will be deposited in the Tiger Conservation Foundation's account of the Field Director. Currently 11 no. of EMC check posts have been established in NSTR.

Table 50: The existing check posts covering NSTR

Sl. No.	Name of the Division	Name of the Range	Location of the Check post
1	**2**	**3**	**4**
1	Markapur	Dornal	Ganapathi
2		Dornal	Korraprolu
3		V.P South	Sirigiripadu
4		V.P South	Ethipothala cross road
5		V.P South	Nagarjunasagar X road
6		Y.Palem	Nerajamulathanda
7	Atmakur	Bairluty	Bairluty EMC
8		Srisailam	Lingalagattu EMC
9		Srisailam	Sikharam EMC
10		Velgode	Velgode
11		Atmakur	Atmakur
12	Nandyal	Chalama	Pacherla
13	Giddalur	Gundlakamma	Diguvametta

These check posts are used to regulate traffic. An entry pass will be given to vehicles between 9PM to 6AM at the time of entry at check post and shall be handed over at exit point to regulate undue overstay in the forest during dark hours. Annexure XII has the Notice on Regulation of Traffic during prohibitive hours on the Hyderabad Srisailam – Dornal Highway passing through NSTR.

Map 57: Showing the Check Posts Inside and Outside of NSTR



The check post staff shall search all vehicles for weapons, fire arms, forest produce and wildlife articles etc., if any carried both at entry and exit points. They shall also take entry of the details of animals sighted by the passenger.

10.3.8. Modernization of Check Posts:

- All the transactions at check posts shall have the computerized facility for quick disposals. All necessary information boards have to be neatly put up at the conspicuous corner of the entrance. The details of the information to be displayed are discussed under para 8.4.3 of signage.
- Automatic voice repeaters, audio displays to be installed to guide the visitors about the rules and regulations to be followed in the sanctuary.
- All the check posts shall be connected with intra and inter communication facility for fast exchange of information.
- Fastag shall be implemented.

10.3.9. Strengthening Communication Network:

- The entire sanctuary was connected with network of 15 VHF (25 watts) fixed wireless stations. The field staff could contact one of the fixed stations with a walkie-talkie. At present only three stations are revived. Since the situation is improved now all the stations shall be revived as they were.
- Each of the Beat Officers (Forest Guards) shall be given walkie-talkie. The use of wireless shall be made for reporting - Sighting of wild animals. Kill cases (By carnivores), smuggling, poaching, outbreak of fire and sending census data etc.

10.4. FIRES IN NSTR:

Fires in Nallamala forests of Critical Tiger Habitat are generally ground borne, of low intensity, and of little risk to human and large animal life, because:

- Local Miscellaneous species do not hold much flammable oil in their leaves and bark; hence fires are not carried in the canopy of the forests.
- Under stories are mostly dominated by grasses which provide the major fuel for fires.

Natural fires rarely occur in the Critical Tiger Habitat, and it also does not experience fires by lightning. Mostly the fires are man-made and ground borne. It burns all the leaf litter, hardly leaves any chance for the humus to develop. Summer fires have become common feature in these dry deciduous forests from January to mid-June

every year. These fires are found to cause the following deleterious effects on the ecology of the sanctuary.

- Fires immediately result in the removal of dry, coarse, and fibrous material
- Kill or partly destroy seedlings, saplings and shrubs,
- Kill the soil micro flora and fauna –the most important agents of building humus, aeration, and nutrients of the soil.

The existence of a public highway through the middle of the sanctuary made it further vulnerable to man-made fires.

10.4.1 Fire Protection Measures:

The Management shall adopt the "Prevention/ protection strategy" well in advance, involving the local people, before the fire season actually sets in. The protection measures include the following steps.

Preventive:

- Surveillance of fire from watchtowers and by patrol parties.
- The cutting and burning of specially created fire lines (979.01 km.) along with strips adjoining forest roads, range boundary lines and compartment lines well before the fire season.
- Creation of temporary fire watch towers at strategic locations throughout the area.
- Early burning of grasslands on the basis of burning regime, and creation of firebreaks.
- Regular removal of dry leaves from fire-lines throughout the fire season.
- Monitor the occurrence of fire with the help of fire watchers round the clock through wireless network.
- Deployment of fire extinguishing squads (vehicular and non-vehicular)
- Constant patrolling by the patrolling camp staff.
- Strengthening of existing fireline network and maintenance of old firelines and creation of new firelines.

Control:

- Strip clearance by the fire extinguishing squad
- Manual putting out of fire-by-fire beaters
- Counter firing by the squads
- Communicating the fire outbreak news to fire parties

Counter fire is the best method of controlling fire. A-5-meter-wide line to be quickly cleared at least 20m from the spreading fire area on windward side. Then dust to be collected and thrown with shovels on the fire simultaneously using beaters to break the fire. Good liaison with fire service department would be of great help during fire season.

10.4.2 Cool burning areas:

The following locations are vulnerable for fire and they shall be protected by adopting cool burning regime

1) Srisailam 2) Thummalabailu 3) Peddacheruvu 4) Nagaluty 5) Nekkanti 6) Chamavally 7) Peddamanthanala 8) Rollapenta 9) Gundla Brahmeswaram and 10) Gundlakamma. 11) Chinna Manthanala.

Cool burning is advisable during December and January under the close supervision of the concerned Section and Beat officers. The methodology is described in the fire line maintenance and fire fighting's circular. The fire management plan has to be prepared separately by each division for effective fire control and prevention**.**

10.5. INTELLIGENCE GATHERING AND CO-ORDINATION

- Generally, in the State, the Office of the Chief Wildlife Warden co-ordinates the cases related to poaching of wild animals and other wildlife crimes and maintain data base, while the Conservator of Forests and the Field Director at Circle level.
- In most of the cases, the rate of successful prosecution in wildlife cases is low, due to, poor investigation, defective prosecution reports (charge sheets), mishandling of cases by Public Prosecutors and lack of supervision by the officers concerned.
- In order to strengthen the protection of the wildlife and for successful handling of the wildlife crime cases the following procedures have to be scrupulously followed.
    i. Collection
    ii. Evaluation
    iii. Collation
    iv. Analysis
    v. Dissemination
    vi. Staff training
    vii. Sources of Information

10.5.1. Information Gathering is to be done through

i. Contacts
ii. Surveillance
iii. Undercover Operation
iv. Investigating Tools
v. Crime Scene Search
vi. Collection of Evidence
vii. Criminal Investigation.

10.5.2. Creation of Criminal Profile Directory

Criminal profile directory is to be built up with the inputs from the Police, Prosecution wing of the Judiciary, Wildlife Crime Control Bureau and other Enforcement agencies. The criminals involved in serious poaching cases are to be continuously watched for.

10.5.3. Coordination

Efforts to put a system in place to co-ordinate with the Police, Prosecution, Judiciary, the Wildlife Crime Control Bureau and Reserve management in the State of Telangana should be on a continuous basis. Over a period of time, it should be possible to build up and share the database to achieve a satisfactory level of detection, prosecution and conviction of the offenders in each of the poaching cases of Tiger.

10.5.4. MAINTENANCE OF EXISTING INFRASTRUCTURE

The following existing infrastructure shall be maintained regularly. In addition, a temporary camping facility may also be created on need basis to strengthen the protection of forests and wildlife.

a. Pecheruvu (Atmakur Division)
b. Nagaluty (Atmakur Division)
c. Rudracode (Atmakur Division)
d. Darabailu (Markapur Division)
e. Rollapenta (Markapur Division)
f. Thummalabailu (Markapur Division)
g. Peddapenta (Markapur Division)
h. Palutla (Markapur Division)
i. Obulesunipenta (Giddalur Division)

j. Maddipenta (Giddalur Division)
k. Isukagundem (Giddalur Division)
l. Gundla Brahmeswaram (Nandyal Division)
m. Rudravaram / Upper Ahobilam (Nandyal Division)

10.6. CREATION OF SPECIAL TIGER PROTECTION FORCE (STPF):

The Hon'ble Finance Minister in his Budget speech on 29.02.2008 interalia action points relating to tiger protection (para 114, Sl.No.74) has proposed Central Assistance (100 %) to states under the ongoing Centrally Sponsored Scheme of Project Tiger for raising, arming and deploying the Special Tiger Protection Force (STPF) through the National Tiger Conservation Authority (NTCA).

10.6.1. Composition of the Force:

NSTR requires a Special Tiger Protection Force (STPF) with 03 (three) Platoons, headed by the Assistant Conservator of Forests (Tiger Force Assistant Conservator of Forests) and each Platoon consists of 01 (one) Tiger Force Forest Range Officer, Tigre Force Foresters (Forest Section Officer) 05 (Five) and Tiger Force Forest Guards (Forest Beat Officers) 25 (Twenty-Five). The Squad / Troop required for formation of Special Tiger Protection Force (STPF) with 03 (three) Platoons is shown in the following Table.

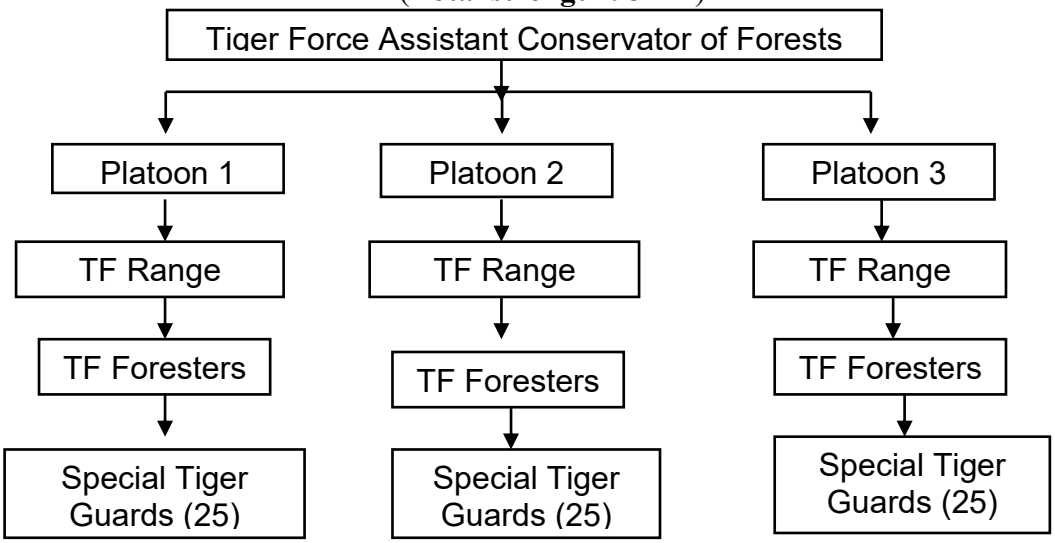
Table 51: Squad/Troop required for formation of Special Tiger Protection Force

SI.No	Name of the platoon	Designation of the officer	No. of officers required	Remarks
1	Assistant Conservator of Forests		01	
	Platoon -1	Forest Range Officer	01	
		Foresters (Forest Section Officer)	05	
		Guards (Forest Beat Officers)	25	
2	Platoon -2	Forest Range Officer	01	
		Foresters (Forest Section Officer)	05	
		Guards (Forest Beat Officers)	25	
3	Platoon -3	Forest Range Officer	01	
		Foresters (Forest Section Officer)	05	
		Guards (Forest Beat Officers)	25	
		TOTAL	**94**	

10.6.2. Structure of a company:

It is submitted that, from the above structure the Platoon-1 constituted for the Project Tiger, Atmakur which will be under the control the Deputy Director, Project Tiger, Atmakur, Platoon-2 under the control of the Deputy Director, Project Tiger, Markapur and similarly the Platoon-3 will be shared between Project Tiger, Nandyal and Giddalur and under the control of Deputy Directors, Project Tiger, Nandyal and Giddalur.

STRUCTURE OF STFP
(Total strength 93 + 1)



10.6.3. Overall command and control:

(i) The Tiger Force Assistant Conservator of Forests in-charge of the STPF and other personnel would work under the overall control and supervision of the Field Director of a Tiger Reserve. The administrative as well as operational command of the said force would remain with the Field Director of the tiger reserve, who will be the appointing / disciplinary authority also. The NTCA would be required to pay the deployment charges to the State Government or reimburse such costs relating to STPF, on the lines of India Reserve Battalion. The reimbursement / payment would be 100% central assistance from the NTCA.

(ii) In the situation of an emergency, the Ministry of Environment and Forests, GoI would have the authority to transfer the STPF companies from one place to another using the first right of call. The Government of India will also have full authority to ask the State Government to make the companies available for deployment elsewhere in other tiger reserves within the State, or in sensitive interstate borders for tiger protection. It will also have the right to decide the number of companies to be posted in each tiger reserve.

10.6.4. Recruitment:

(i) The recruiting authority for the STPF would be the local Forest Department.

(ii) Recruitment to the posts of Tiger Force Foresters and Special Tiger Guards of the STPF companies would be done locally from the State where the Tiger Reserve is situated, while the Tiger Force Assistant Conservator of Forests and the Tiger Force Range Officers would be appointed to the force on deputation from the State Forest Department.

(iii) 30% of Special Tiger Guards in the STPF would be deployed through outsourcing from the local forest dwelling people like Van Gujjars, Gonds etc. To provide scope for the same, the educational qualifications prescribed for a Forest Guard should be suitably relaxed.

10.6.5. Legal immunity to STPF for discharging the official mandate:

(i) The STPF personnel, being forest officers, will have policing powers as conferred to them by law.

ii) The State Government would be required to confer powers to the STPF personnel under sub-section (3) of Section 197 of the Code of Criminal Procedure,

1973 (2 of 1974), and all powers enabling it in that behalf, the power to use fire arms to combat tiger poaching and related offence within the tiger habitat, through a notification. In this context, sub-section (2) of Section 197 of the Code of Criminal Procedure, 1973 (2 of 1974) should be made applicable to all personnel of the STPF.

iii) Whenever, firing is resorted to by the STPF personnel, each such incident shall be enquired into by the Executive Magistrate; any proceeding, including instituting a criminal case or arrest can be initiated only if it is held, as a result of the Magisterial Enquiry, that the use of fire arms has been unnecessary, unwarranted and excessive, only after such report has been accepted by the Government after due examination.

10.6.6. Other features:

(i) The STPF, not being an "Armed Force of the Union", would be used only for tiger protection, and under no circumstances would be requisitioned in aid of Civil Authority, for any other district work. An MOU has to be formalized between the NTCA and the State of deployment.

(ii) The initial funding support for raising, arming and deploying the STPF would be provided from the one-time grant given to the National Tiger Conservation Authority (NTCA), and would be supported subsequently in an ongoing manner through grants provided to the said Authority.

(iii) The Field Director of the Tiger Reserve would be required to provide monthly reports on the deployment / initiatives done by the STPF to the NTCA.

10.6.7. Training:

(i) The STPF companies would receive special training from the State Police Department as well as the Central Paramilitary Forces, based on a special syllabus for skill development, combating poaching, and enabling intelligence-based enforcement in a forest terrain.

ii) The training of the STPF would be on the pattern of a syllabus of basic training which would be prescribed by the Ministry of Environment and Forests, on the basis of the ongoing syllabus prescribed by the Ministry of Home Affairs for the India Reserve Battalion.

iii) Arrangements will be made for regular physical training of STPF in collaboration with the available resources.

iv) Specialized trainings would be provided in enforcement procedures by noted agencies including international visits if the need arises.

Nagarjunasagar Srisailam Tiger Reserve is the largest tiger reserve in India, and home for minimum 80 tigers in wild. Moreover morethan 20 villages are habituated within the core area of Nagarjunasagar Srisailam Tiger Reserve and many villages are within / adjoining to the Buffer area of Nagarjunasagar Srisailam Tiger Reserve. Therefore, there is a high scope for poaching in the forests of Nagarjunasagar Srisailam Tiger Reserve. Enhanced protection measures through skilled man power in combat operations are inevitable for maintaining peace in the forests and to avoid un toward poaching incident.

INTER-STATE CO-ORDINATION BETWEEN ANDHRA PRADESH AND TELANGANA:-

It is proposed the following safeguards for inter state co-ordination as because of division of the state NSTR will be falling in both the states. The following safeguards are proposed:-

- The Forest Range Officer levelcoordination isessential on day-to-day basis or as per requirement in adjoining ranges of both the states.
- A combined patrol is proposed in the river Krishna to avoid the encroachments and illegal fishing as right bank which is situated in Andhra Pradesh and Left wing is situated in Telangana.
- The camera trap images of tigers as well as other wildlife will be shared between the two tiger reserves on regular basis as the tiger crosses the river often as it is proven by the existing camera trap images.
- Field Directors of both the tiger reserves and concerned divisional forest officers can have regular meeting to streamline and sort out the protection issues once in a month.
- At state level both the Chief Wildlife Wardens can have a coordination meeting once in 3 months to sort out the co-ordination issues between the 2 tiger reserves.
- Special task force with one ACF and 2 FROs from each tiger reserve may be constituted as it is a continuous landscape to provide better protection to tigers and

other wildlife in this largest tiger landscape of the country.

- Intelligence inputs will be shared by the management of both the tiger reserves on regular basis.
- The information related to research inputs may be shared by the management of both the tiger reserves for better and effective management.

CHAPTER 11

Eco-Tourism and Interpretation



Introduction:

The IUCN Eco tourism programme defines 'Eco-tourism" as "*Environmentally responsible travel and visitation to relatively undisturbed natural areas in order to enjoy and appreciate nature, that promotes conservation, has low visitor impacts and provides for beneficially active Socio-economic involvement of local population*"

Ecotourism is always sustainable and respects nature conservation and the culture of local communities credited with protecting such areas. In a way, it also resists environmental degradation, encourage nature conservation, and also sustain traditional communities. As per the government policies and opinions of conservationists, most protected areas of our country can only sustain low impact tourism. The NSTR Core Zone, is one of the finest wildlife protected areas of the country and offers excellent opportunities to the visitors for enjoying tremendous floral, faunal and natural attributes of pristine wilderness In view of the above, it is important that the sustainability of tourism vis-à-vis satisfaction of national and international visitors and message of conservation awareness is ensured by the Park Management.

The eco- tourism, if controlled and regulated, and keeps in tune with provisions of Act and policies on wildlife conservation, it could prove to be an effective tool for management for eliciting public support, and also provide ample opportunities to people for nature and wildlife viewing.

11.1 ORGANIZATION SETUP AND MANAGEMENT

Nagarjunasagar Srisailam Tiger Reserve comprises four divisions, namely Project Tiger, Atmakur, Markapur, Giddaluru, and Nandyal. All the four divisions are under the unified control of the Field Director, Project Tiger Circle, Nagarjunasagar Srisailam Tiger Reserve. Each division currently holds immense potential for tourism. To counter the ill effects of mass tourism, and the environmental degradation and pollution which accompany mass tourism, it has been decided to adopt sustainable eco-tourism initiatives. Sustainable eco-tourism, which is community-based, not only helps preserve the environment but also provides livelihood to local communities and tribal populations living in and around the Nagarjunasagar Srisailam Tiger Reserve.

11.1.1 Notified Guidelines for Tourism by NTCA:

The Supreme Court of India, while hearing the Special Leave Petition (Civil) 21339 of 2011 Ajay Dubey Vs. National Tiger Conservation Authority & others, had directed the Ministry of Environment & Forests and National Tiger Conservation Authority, Govt. of India to prepare effective guidelines for tourism in and around tiger reserves. Accordingly, the NTCA has duly submitted and notified the above comprehensive guidelines vide No./15-31/2012-NTCA dated 15th October, 2012 in the Gazette of India, Extraordinary, Part-III, Section-4. Part-B of the above document deals exclusively with tourism in and around tiger reserves. The guidelines also envisage that the State shall ensure that each Tiger Reserve prepares a tourism plan, as part of the Tiger Conservation Plan vis-à-vis the technical Guidelines of the National Tiger Conservation Authority. The plan shall inter alia, include identification of corridor connectivity and important wildlife habitats and mechanisms to secure them. This site-specific tourism plan forming part of the Tiger Conservation Plan shall be approved as per the provisions of the Wildlife (Protection) Act, 1972. Prior to this approval, no new infrastructure for tourism (except for minor alterations in existing modest home stays) shall be allowed to be developed in and around Tiger Reserves. The ecotourism and interpretation sub-plan contained in this chapter is prescribed in the backdrop of the above guidelines issued by the NTCA, New Delhi.

11.1.2 Objectives:

The specific objectives of ecotourism management in the core area are as under:

- To develop facilities for promoting safe, restful and enjoyable tourism, and enhance the quality of visitors' experience.
- To complement the economy of the local people living mainly around the Core Zone.
- To develop/ maintain park interpretation facilities for creating conservation awareness, educate people on various aspects of nature conservation.
- To ensure light tourism and minimize its impact on the resources of the core area.

11.2 DETERMINATION OF CARRYING CAPACITY:

Model calculation given below. Presently, the calculation of carrying capacity requirement may not arise. The number of vehicles is very small—only 3–5 vehicles are there at three places, i.e., Bairluty, Pacherla, and Tummalabailu, and the length of the road is also bare minimum. Once the area is expanded and the length of the safari increases, the assessment of carrying capacity will be done, and accordingly, the vehicles will be allowed.

Assumptions:

- Only vehicular movements permitted on forest roads; hence road length is more relevant than area
- "Standing area" is not relevant, but closeness between vehicles is important
- There is a required distance of at least 500 m. (½ km.) between 2 vehicles to avoid dust (2 vehicles / km.) ……. [v/a]
- At least 3½ hours are needed for a single visit
- The PA is open to tourists for 9 months in a year and 10 hours per day (Guidelines of GoI to be followed).
- Linear road length (for tourists) = 300 km…
- [A]= Available area for public use
- V/a = one visitor/M^2
- Rf = Rotation factor (No of visits/day)

i. Physical Carrying Capacity (PCC) …….. PCC = A * v/a * Rf

Opening period Rotation Factor (Rf) = (Hrs/day) / (Hrs/visit) = 10 hours / 3.5 hours = **2.8**

*Open Hours per day = 7 A.M to 5 PM

PCC = A * v/a * Rf = 300 km. x 2 vehicles / km. x 2.8 = **1680 visits / day**

ii. Real Carrying Capacity (RCC): RCC is the maximum permissible number of visits to a site once the "reductive factors" (corrective) derived from the particular characteristics of the site have been applied to the PCC. These reductive factors are based on biophysical, environmental, ecological, social and management variables.

$RCC = PCC - Cf_1 – Cf_2 \ldots\ldots\ldots\ldots Cf_n$

Where Cf is a corrective factor expressed as a percentage.

Thus, the formula for calculating RCC is:

$$RCC = PCC * \frac{100-Cf_1}{100} * \frac{100-Cf_2}{100} * \ldots\ldots\ldots \frac{100-Cf_n}{100}$$

Corrective factors are site specific and are expressed in percentage as below

$$\mathbf{Cf} = \frac{\mathbf{M_1 * 100}}{\mathbf{M_t}}$$

Cf = Corrective factor,
$\mathbf{M_1}$ = Limiting magnitude of the variable
$\mathbf{M_t}$ = Total magnitude of the variable

- Road Erosion [Cfe]

Total Road Length = 300 km. or (3000 Mt.)
Medium erosion risk = 40 km. (Weightage factor = 2)
High erosion risk = 60 km. (Weightage factor = 3)

M1 = 40 * 2 + 60 * 3 = 80 + 180 = 260 km.

Total Erosion Risk (**Cfe**) = $\frac{M1}{\text{Linear road Length}} = \frac{260}{300}$ x 100 = **86.66%**

Disturbance to wildlife: Species which are prone to disturbance owing to visitation are considered. The four horned antelope is a highly endangered, endemic species found in India has a courtship period in winter for about a month and half during which

it is extremely sensitive to disturbance. The peak courtship for spotted deer lasts for two months before the onset of regular monsoon. As far as the tigers are concerned, new borns are seen between March and May and also during the rains; hence an average value of two months in a year can be considered as the matter phase

- Disturbance to Wildlife

Sambar (1 month) = Cf_1 = 1/10 *100 = 10 %

Chital (2 months) = Cf_2 = 2/10 *100 = 20 %

Tiger (2 months) = Cf_3 = 2/10 * 100 = 20 %

Overall corrective factor for disturbance of wildlife in NSTR =

Corrective factor (Cf) = $\frac{\text{Limiting months / year x 100}}{\text{12 months / year}}$

Cfw = Cf_1 + Cf_2 + Cf_3 = 10 + 20 + 20 = **50%**

- Temporary closing of sites

Cft = $\frac{\text{2 limiting weeks / year}}{\text{40 weeks / year}}$ x 100 = **5%**

RCC = PCC x $\frac{100 - Cfe}{100}$ x $\frac{100 - Cfw}{100}$ x $\frac{100 - Cft}{100}$

= 1680 x $\frac{100 - 87}{100}$ x $\frac{100 - 50}{100}$ x $\frac{100 - 5}{100}$

= 1680 (0.13 x 0.50 x 0.95

= 103.74 or 104 visits/day

iii. Effective Permissible Carrying Capacity [EPCC]

(MC = Managerial Capacity = 40%)

EPCC = RCC x MC
= 104 * 0.40 = 41.6 or 42 vehicles / day

11.3 IMPLEMENTATION OF ECO-TOURISM GUIDELINES

The following guidelines have been prepared in accordance with the **Guidelines for Sustainable Eco-tourism in Forest and Wildlife areas** issued by the Deputy Inspector General of Forests (WL), Govt. of India, MOEF&CC Wildlife Division vide Lr.No. F.No. 1-57/2014-WL, Dated. 29th October 2021 and **National Strategy for Eco-tourism** issued by the Deputy Director General, Govt. of India, Ministry of Tourism, Govt. of India vide Lr.No. NT-1401/2/2021, Dated. 29-04-2022.

The following guidelines are to be followed for all Eco-tourism activities undertaken in Nagarjunasagar Srisailam Tiger Reserve.

- Identification of Eco-tourism sites within the identified tourism zone – Efforts have been made to include all sites with a potential for Eco-tourism in this Tiger Conservation Plan. All sites should be identified through a participatory process involving all stakeholders, particularly the local communities. In cases where a site has been identified following these norms and the Field Director is convinced that the Eco-tourism activities will not have any adverse impact on the local flora and fauna, he / she may grant permission for development of such site.
- All Eco-tourism activities are to be community based eco-tourism where the local stakeholders an integral part of the Eco-tourism activities.
- Funding for establishment and maintenance of Eco-tourism may be from various sources such as Central and State schemes, APTCF etc.
- All Eco-development Committee's will come under the umbrella of APTCF. All revenue accrued will be deposited in APTCF and provision will be made in APTCF for all expenditure required for running Eco-tourism activities.
- Efforts to use the latest relevant technologies should be given high priority. Technologies should be utilized for advertisement, account keeping, stock inventory, bookings etc., Tiger Reserve managers should focus on technologies which ensure the eco-tourism facilities reach a wider audience, are more efficiently run and chances of misappropriation are drastically reduced.
- One of the core principles of eco-tourism is benefit sharing with the local communities. It should be ensured that all eco-tourism facilities employ personnel

primarily from the local communities wherever possible. A portion of revenue generated from Eco-tourism activities may be used for the betterment of local communities through the APTCF.

- Education about the Tiger Reserve and the importance of conservation should form an integral part of any eco-tourism initiative. All managers of the Tiger Reserve should target different age groups for imparting information regarding conservation, its importance, knowledge regarding flora and fauna, local tribal groups etc., This may be done through the use of signage's, pamphlets, displays, audio-visual aids etc.
- Safety of visitors to the Tiger Reserve and eco-tourism sites must be given high priority. All eco-tourism facilities should have a first-aid kit and information regarding the location of the nearest medical facility. In case of any mishap, transport to the nearest medical facility should be provided. All divisions should maintain a stock of anti-venom in case of snakebites.
- All Eco-tourism sites should phase-out single use plastic as per instructions issued by the Central Pollution Control Board, Govt. of India, New Delhi vide Lr.No. D.O.No.B.17011/1/UPC-II/PWM/(SUP)/20225048, Dated. 12-10-2022. Water Purifiers should be installed for the visitors to eco-tourism sites and the use of plastic bottles for drinking water should be avoided.
- All Managers of the Tiger Reserve should have a comprehensive monitoring system of the eco-tourism sites under their control. Real time monitoring using appropriate technologies (E.g. CCTV) should be adopted without invasion of a person's (guests) privacy.
- Washroom facilities should be provided in all eco-tourism facilities regardless of the size or footfall. These facilities should have a continuous supply of water and cleaned at least twice a day. Tiger Reserves Managers should ensure that a robust system is put in place to ensure maintenance of hygiene and cleanliness.
- Potable drinking water should be made available for all visitors.
- Use of indigenous, locally produced and ecologically sustainable materials for establishment and running of Eco-tourism sites should be done wherever possible.
- Efforts should be undertaken to highlight the culture of the local tribals (Chenchus etc.,) in all eco-tourism activities.

- Low cost, low impact philosophy should be adopted while visualizing and developing any eco-tourism initiative.
- Skill development of local communities should be encouraged and may be undertaken in the following ways: -
  i) Skill development and upgradation of local staff involved in running eco-tourism facilities.
  ii) Skill development of members of the local community so that they can produce high quality local goods which can be marketed in eco-tourism facilities.
  iii) Entrepreneurs from the local community should be facilitated for providing goods and services for eco-tourism initiatives.
- Adventure activities may be undertaken as a part of eco-tourism only with the help of certified guides from a recognized institution.
- Regular monitoring and review of Eco-tourism facilities should undertake by Tiger Reserve Managers to ensure that the eco-tourism facility is safe, clean, hygienic and well run.

11.3.1 Development of Participatory Ecotourism & Visitor Strategy:

The following planning imperatives have to be undertaken for the development of an overall eco-tourism strategy and will be incorporated after assessing the potential of tourism.

- Participation of local communities.
- Sound environmental design.
- Visitor management.
- Conservation education.
- Training.
- Financial sustainability.
- Monitoring and evaluation.

The preparation of a participatory community-based ecotourism strategy for the project area, involving the stakeholders through meetings and workshops, should address the following:

- Development of monitoring mechanisms for ecological impact of eco-tourism.
- Visitor information and levels.

- Development of guidelines for visitors/ staff viz., visitor centre, orientation centre, brochures, handbook, signages.
- Development of mechanisms to collate visitation data for management.
- Development of guidelines/ building code for environmentally acceptable and culturally appropriate designs.
- Identification of staffing levels for tourism, future requirements & training needs.
- Identifying: institutional arrangement for eco-tourism management, mechanisms to increase long-term local participation in benefit sharing and decision-making, local training needs.
- Developing, monitoring & evaluation of plans to assess local participation & benefit sharing.
- Evolving legal framework for eco-tourism activities.
- Establishing administration and legal requirements for: zoning, entry fees, revenue sharing with indigenous people.

11.3.2. Eco-Tourism Plan of Nagarjunasagar Srisailam Tiger Reserve for the Period 2013-14

The existing eco-tourism sites / zones developed as per Tiger Conservation Plan 2013-14 to 2022-23 are as follows.

Table 52: Existing Eco-Tourism Sites / Zones in Core Area of NSTR

Sl. No.	Tourism Zone	Tourism Site	Year of starting
1	Nagarjunasagar tourism Zone	Ethipothala waterfalls, Veeranjaneyapuram	2007
2	Peddacheruvu tourism Zone	Nallamalla Jungle Camps and Safari, Bairluty	2015
3		Nallamala Jungle Safari, Thummalabailu	2017
4	Srisailam over lapping tourism	Nekkanti Jungle Ride, Nekkanti	2021

11.3.3. Proposed Eco-Tourism Plan of Nagarjunasagar Srisailam Tiger Reserve for the Period 2023-24 to 2032-33: -

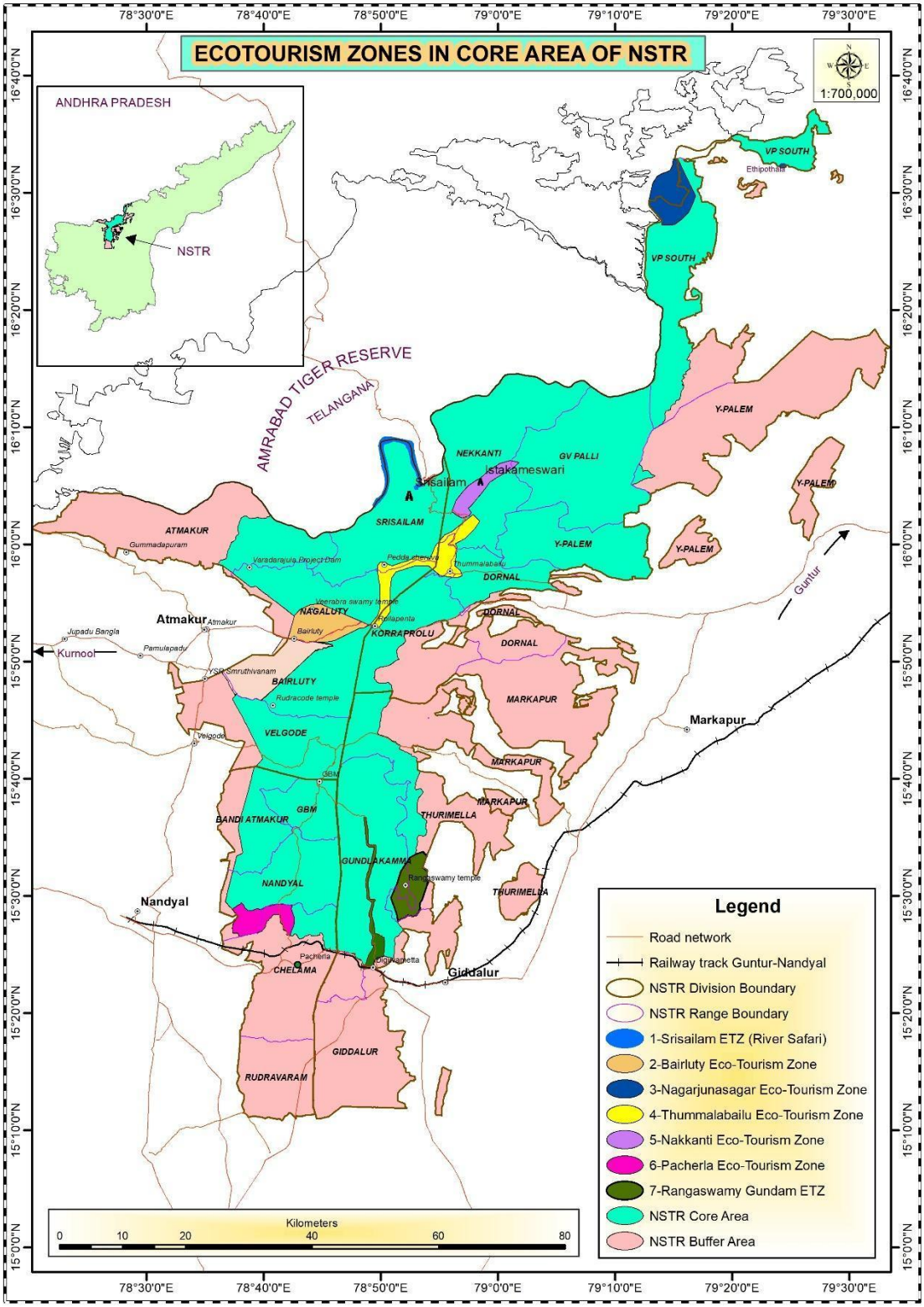
The Eco-tourism zones have been proposed after a number of meetings of the Field Director and the Deputy Directors. After many deliberations and taking into account all the instructions of NTCA the following Eco-tourism zones have been identified outside of the Core. These zone falls within the limits prescribed by NTCA.

Considering the vastness of the area and dependence of the fringe villages on the Tiger Reserve, there is an imminent need for promotion of eco-tourism in strategic locations, especially in Buffer areas to reduce stress on forests and wildlife by the fringe villages by promoting and enhancing alternative livelihood opportunities to the local communities. The tourism activities proposed are planned in such a way that they are sustainable and cause minimal disturbance to the wildlife by adhering to the carrying capacity of the tourism sites/zones.

Table 53: Eco-tourism Zone proposed in Core area of NSTR

Sl. No.	Tourism Zone	Tourism Site	Division & Range	Protected area status
1	Srisailam Eco-Tourism Zone	Srisailam (River Safari)	PT Atmakur, Srisailam	Core area of NSTR
2	Bairluty Eco-Tourism Zone	Bairluty, Rudracode,	PT Atmakur, Nagaluty, Bairluty	Core area of NSTR
3	Nagarjunasagar Eco-Tourism Zone	Nagarjunasagar, Ethipothala	PT Markapur, V.P South	Core and Buffer area of NSTR
4	Thummalabailu Eco-Tourism Zone	Thummalabailu, Peddarutla, Naramamidi Cheruvu and Rollapenta	PT Markapur, Dornala, Korraprolu, Nekkanti and Srisailam	Core and Buffer area of NSTR
5	Nekkanti Eco-Tourism Zone	Nekkanti Jungle Ride	PT Markapur, Nekkanti	Core area of NSTR
6	Pacherla Eco-Tourism Zone	Pacherla Jungle Safari	PT Nandyal, Pacherla	Buffer area of NSTR
7	Rangaswamy Gundam Eco-Tourism Zone	Diguvametta Jungle Safari and Ranga swamy gundam Jungle Safari	PT Giddalur Gundlakamma and Turimella	Core and Proposed Buffer areas of NSTR

Map 58: Map showing the Eco tourism Zones existing and proposed in NSTR



11.3.4. Proposed Eco-Tourism Plan of Project Tiger, Atmakur for the Period 2023-24 to 2032-33:

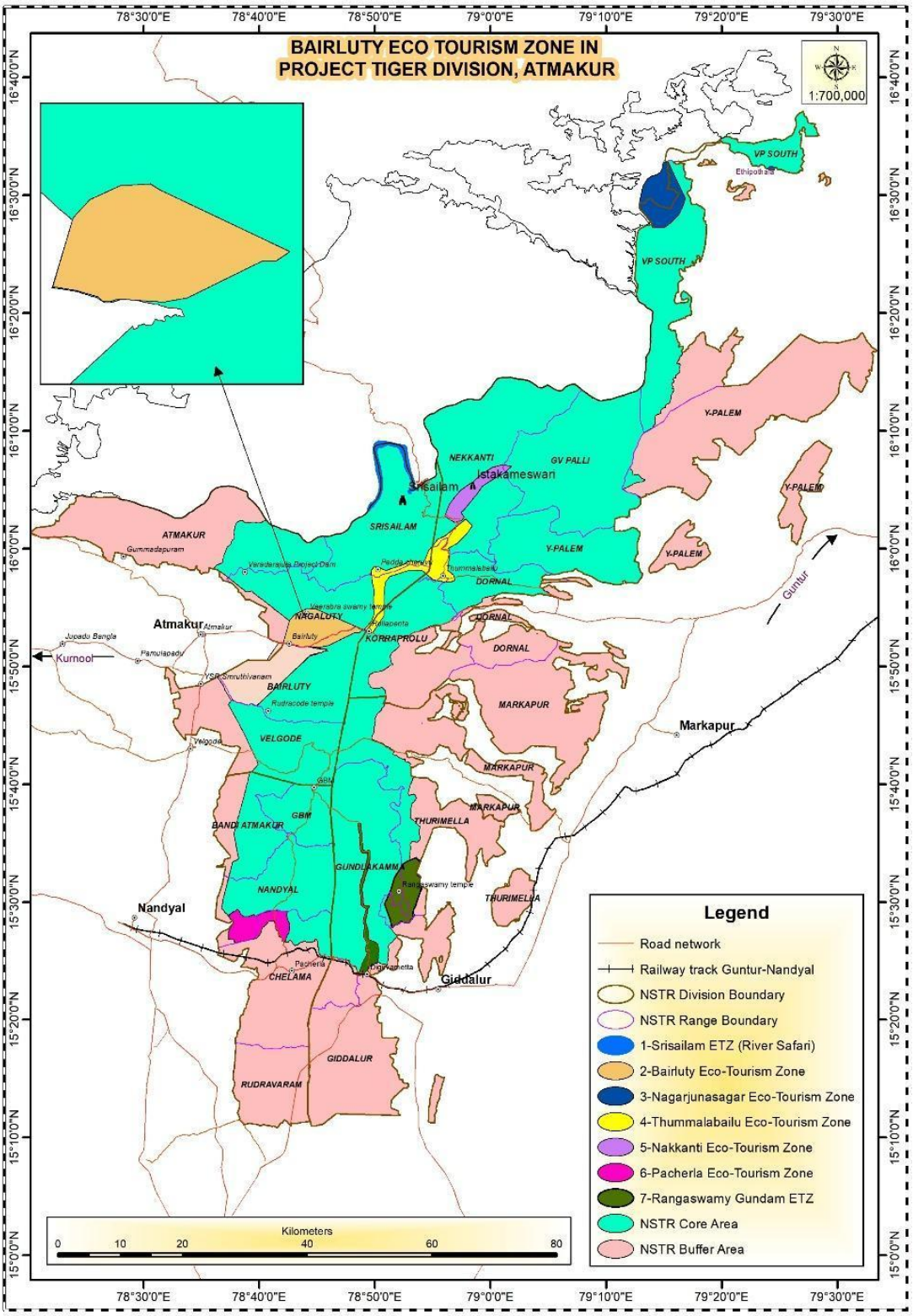
11.3.4.1 Bairluty Eco-Tourism Zone:

Bairluty Eco-tourism zone is proposed in the following compartments of Nagaluty and Bairluty Ranges of Project Tiger, Atmakur.

Table 54: Bairluty Eco-tourism Zone

Sl. N.o	Name of the Eco-tourism site	Nearest land mark	Beat / Range	Protected area status	Compt. Nos.	RF Block
1	2	3	4	5	6	7
1	Eco tourism, Bairluty	Bairluty	Nagaluty Beat / Nagaluty Range	Core area of NSTR	753, 754, 755, 756, 757, 765, 766	Nandikotkur RF

Map 59: Showing the Bairluty Eco Tourism Zone in Project Tiger Division Atmakur



Existing Nallamala Jungle Safari, Bairluty of Nagaluty Range:

Nallamala Jungle Safari, Bairluty Eco-Tourism Centre (N: 15.86801, E: 78.71322) is located on Kurnool – Guntur Road at a distance of 13 Kms from Atmakur Town, Nandyal District, A.P. and was started during May, 2017. The project was taken up with a financial outlay of Rs.2.140 Crores and is being managed by Eco-Development Committee, Nagaluty Gudem, which is 3 Kms away from the Eco-Tourism Centre, Bairluty.

This centre is established at a strategic location i.e. on Kurnool-Guntur Road, which has its own prominence being enroute to Guntur, one of the historic temples in Hindu Culture, attracts a lot of pilgrims and tourists. A very good response is observed from the public.

Existing facilities:





1. Semi-permanent Cottages – 6 Nos.
2. Semi-permanent tented accommodation – 4 Nos.
3. Semi-permanent Wooden Cottages – 2 Nos.
4. Semi-permanent Cafeteria – 1 Nos.
5. Semi-permanent Souvenir/Reception Center– 1 Nos.
6. Environmental Education Center – 1 Nos.
7. Family House – 2 Nos.
8. Children Play Zone.
9. Safari
10. Archery range
11. Interpretation center
12. Souvenir shop

11.3.4.2 Proposed Velgode Tiger Safari:

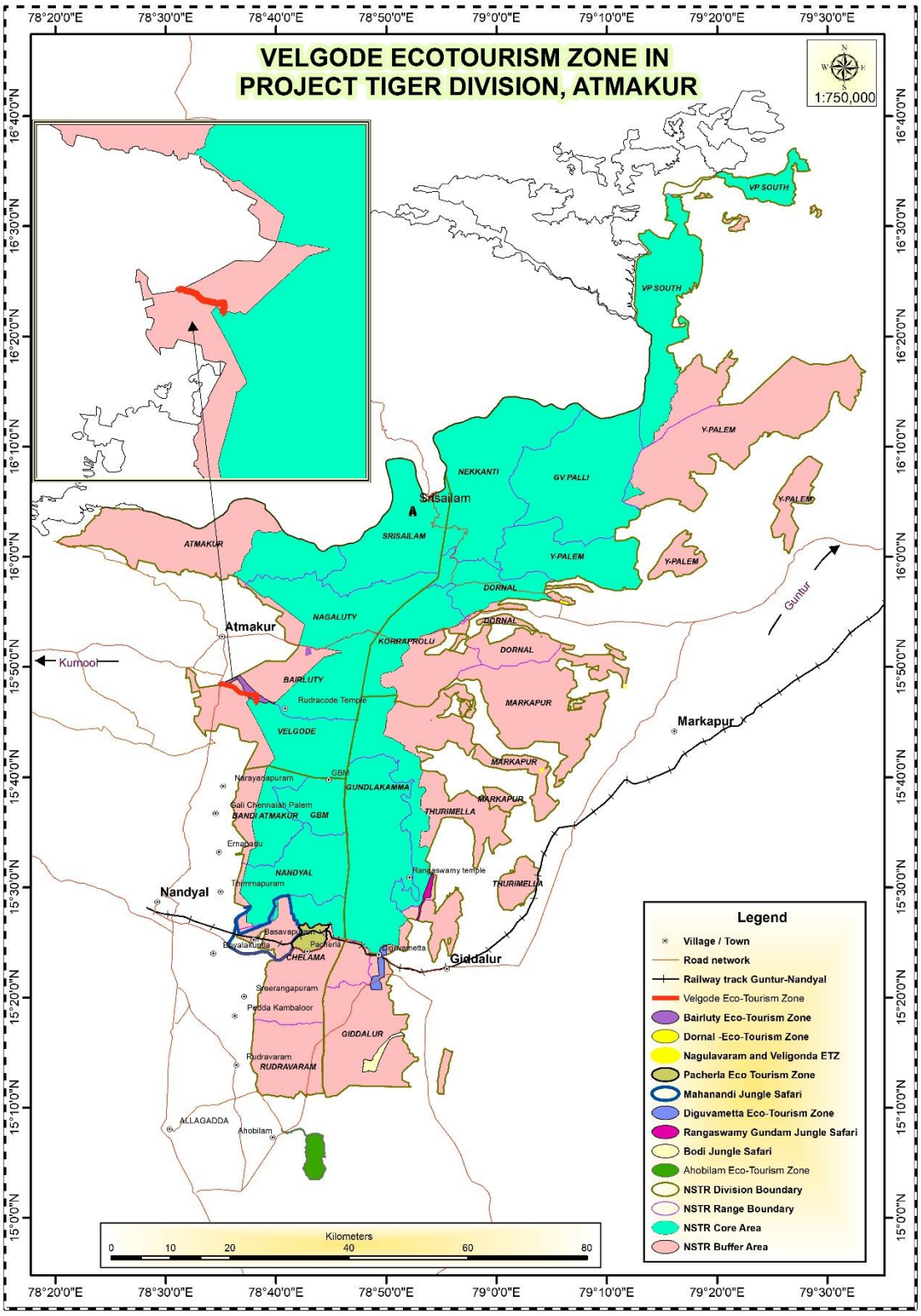
Velgode Tiger Safari is proposed in the following compartments of Velgode and Bairluty Ranges of Project Tiger, Atmakur. Only 1 compartment is part of the Core area. Remaining all fall under the Buffer Area.

Table 55: Proposed Velgode Tiger Safari

Sl. No.	Name of the Eco-tourism site	Nearest land mark	Beat / Range	Protected area status	Compt. Nos.	RF Block
1	2	3	4	5	6	7
1	Eco tourism, Velgode	Dr.YSR Smruthi Vanam, Nallakalva	Velgode (North) Beat / Velgode Range	Buffer area of NSTR	656 & 657	Velgode RF
				Core area of NSTR	660	
			Nallakalva Beat / Bairluty Range	Buffer area of NSTR	694, 695 & 712	Velgode RF & Nandyal RF

More activities will be included in future in addition to tiger safari based on the demand and feasibility.

Map 60: Showing the Proposed Velgode Tiger Safari in Project Tiger Division Atmakur



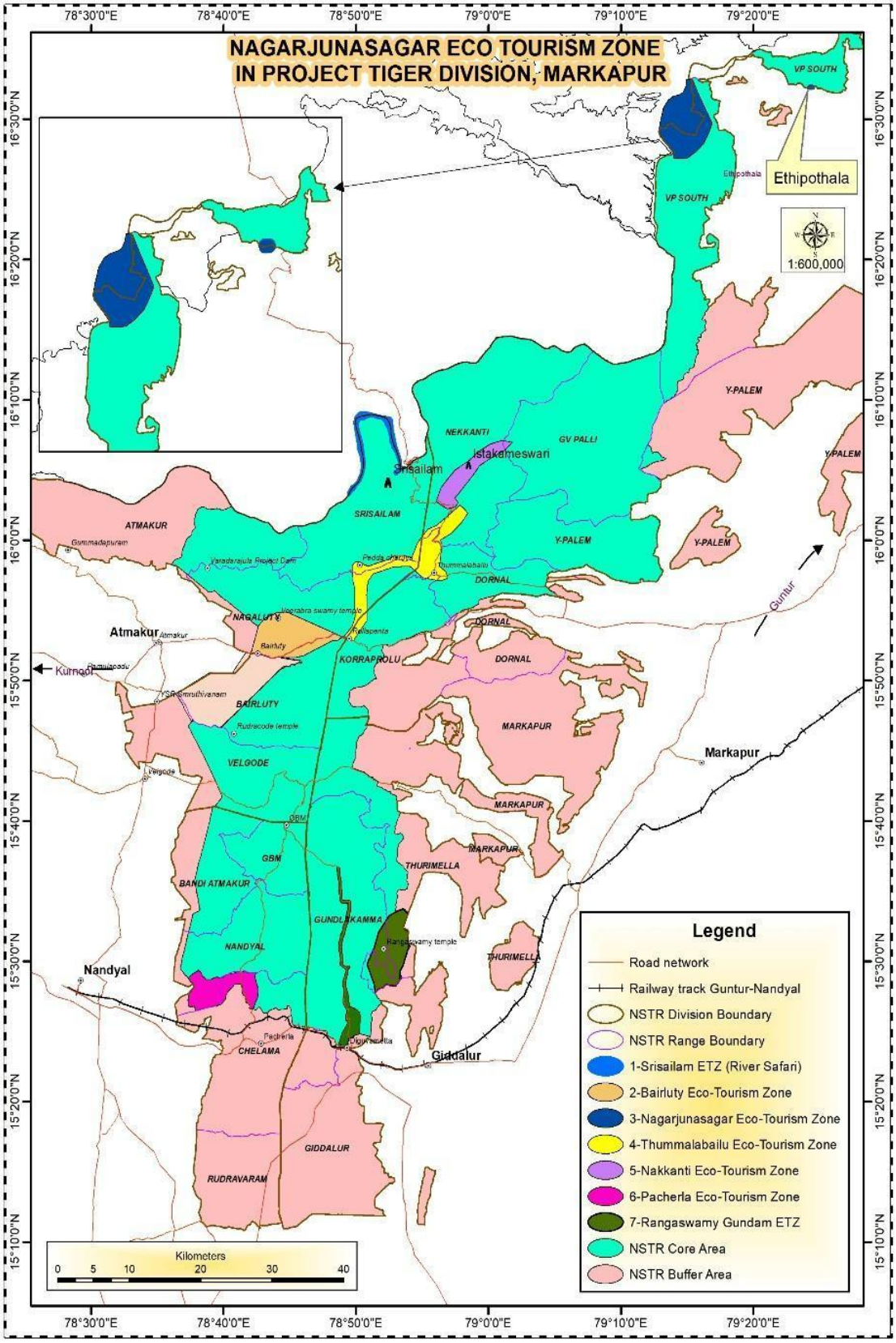
11.3.5 Community-based Eco-Tourism Plan of Project Tiger, Markapur for the Period 2023-24 to 2032-33:

11.3.5.1 Ethipothala Eco-Tourism:

The Community Based Eco-Tourism (CBET) Check Post of Veeranjaneyapuram is located at Ethipothala X-Roads in Compartment No 86 of Pasuvemula Reserve Forest of Pasuvemula Beat, VP South Range.

The CBET Check Post is the common entry point to visitors entering the Reserve Forest area to visit Ethipothala waterfalls and temples existing in the Reserve Forest area. Environmental Maintenance Charges are being collected as per rates fixed by the Field Director PT from time to time. This Eco-tourism site is situated in a strategic location wherein the sites are accessible to Hyderabad, Vijayawada by well-connected Highway network.

Map 61 : Showing the Nagarjunasagar Eco Tourism Zone in Project Tiger Division Markapur



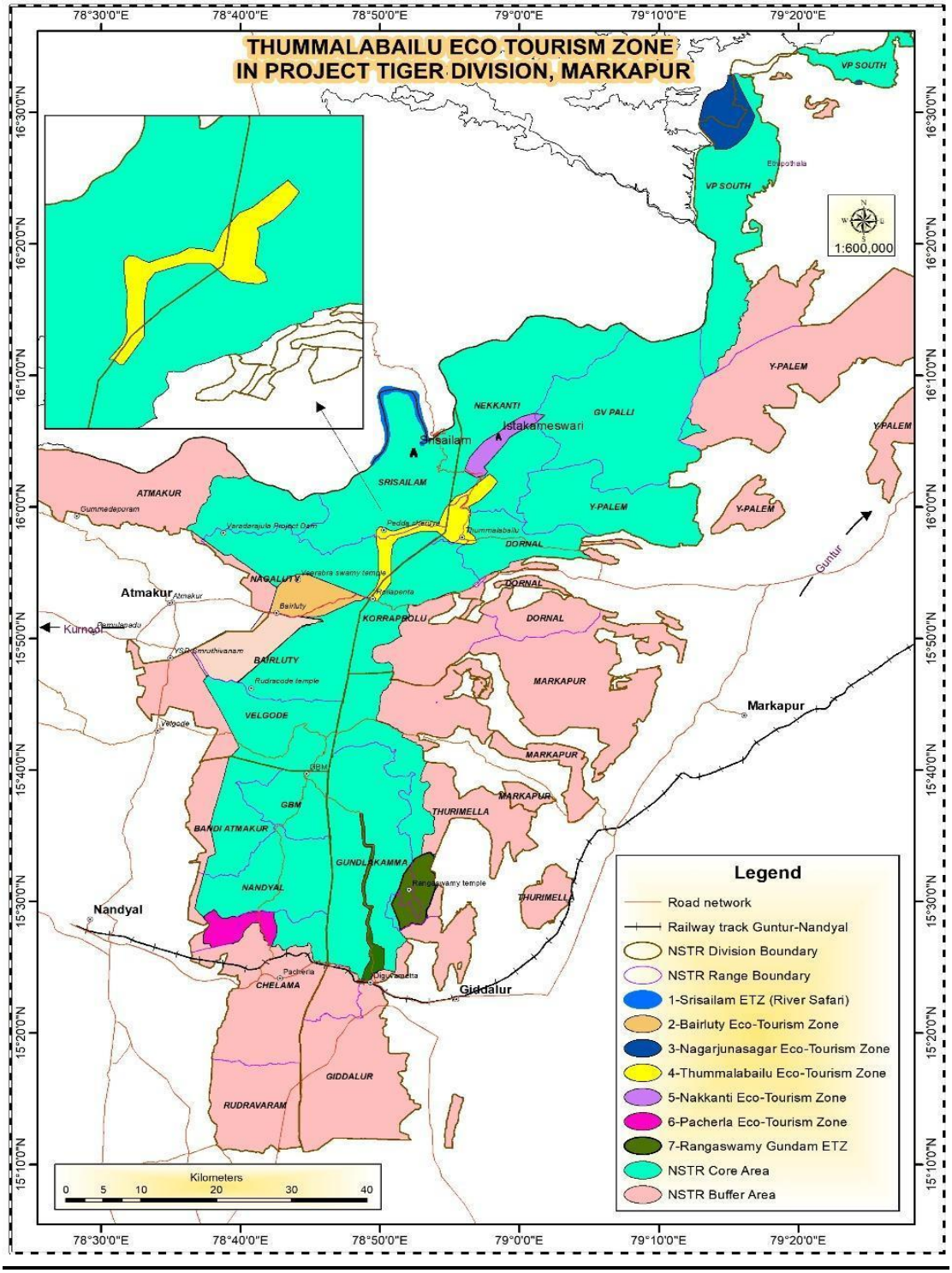
11.3.5.2 Thummalabailu Eco-Tourism Zone:

This Eco-tourism zone spread over four Ranges i.e., Dornal, Korraprolu, Nekkanti and Srisailam Ranges.

Table 56: Thummalabailu Eco-Tourism Zone

Sl. No.	Name of the Eco tourism	Nearest land mark	Beat / Range	Protected area status	Compartments	RF Block
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	Nallamala Jungle Safari, Thummalabailu	CBET, Thummalabailu, Peddarutla, Veerlakunta Watch Tower and marripenta. Rollapenta and Naramamidi Cheruvuru	Thummalabailu beat of Dornal range and Nekkanti, Chinnarutla beats of Nekkanti Range, P.Manthana Beat of Korraprolu Range, Srisailam Range	Core of NSTR	93, 96, 97, 113, 111, 110, 71, 371, 896, 897	Markapur & Nandikotkur RF

Map 62: Showing the Thummalabailu Eco Tourism Zone in Project Tiger Division, Markapur



Nallamala Jungle Safari, Thummalabailu:-

Nallamala Jungle Safari, Thummalabailu Eco-Tourism Centre (N:15.99060, E:78.92410) is located on Dornal to Srisailam Road at a distance of 25 Kms from Dornal and was started during December, 2017. The project was taken up with a financial outlay of Rs.50.277 lakhs and is being managed by Tribal Chenchus of Thummalabailu Gudem, which is 2 Kms away from the Eco-Tourism Centre.

The Eco-Tourism Centre is situated in the Critical Tiger Habitat of Nagarjunasagar - Srisailam Tiger Reserve. The visitors are provided with the facility of jungle safari, which include natural streams, forest areas, grasslands, water bodies, children Tortoise model benches, Butterfly model display signages etc., in open top jungle safari jeeps and is facilitated over a distance of around 12 Kms.

This centre is established at a strategic location, i.e., on Dornal-Srisailam Road, which has its own prominence, being enroute to Srisailam, one of the historic temples in Hindu culture, and attracts a lot of pilgrims and tourists. A very good response is observed from the public. The following are the facilities provided:

Administrative Building: To maintain and manage Thummalabailu Eco-Tourism Centre, an administrative building is set up and employed with 5 Nos. local Chenchus to take care of the centre and to attend duties as guides, and to enlighten the tourists about the flora and fauna of the area, geography, and for exploring the beauty of the Nallamala terrain. They are also utilized as guides, protection watchers, tourist helpers, and stay round the clock at the Eco-Tourism Centre.

Interpretation Centre: An Interpretation Centre equipped with photographic depictions of flora and fauna, depictions of the lifestyle of Chenchus (Primitive Tribal Group), educative wildlife interpretations, and evidences of wild animals viz., scat, pellets, eggs, feathers, pug marks, etc., are exhibited in this centre so as to create awareness on forest and wildlife conservation. Besides, other publicity material like pamphlets and brochures are made available to the public, in addition to souvenirs, which are kept for sale to the public. To disseminate knowledge and information on Nallamalas and NSTR in a lucid and interesting manner, audio-visual aids and robotic technology are used.

Traditional Archery: Though archery was used for hunting and combat historically, it is considered a competitive sport and recreational activity in modern times. Hence, to arouse enthusiasm among the visitors, an archery block was created at Tummalabailu Eco-Tourism Centre to entertain the tourists with traditional archery relating to the lifestyle of the Chenchus. The Chenchus themselves teach the art to the tourists. This event has gained much popularity among the visitors.

Jungle Safari: The visitors are provided with a safari facility, wherein they are taken into the forest in Jungle Safari Jeeps. During the safari, the visitors experience the wilderness of Nallamalas—the terrain, the valleys and gorges, vantage points, streams, rivulets, and tanks. They also witness the flora and fauna of Nallamalas, some of which are endemic.

Jungle Safari jeeps are kept for jungle safari for the tourists. Six to eight persons per vehicle are allowed to go around 12 kms of jungle safari, which covers natural streams, water bodies, flora and fauna, forest areas, grasslands, etc., which not only gives a feel of the wild but also provides a unique opportunity to experience the beauty of nature. Jungle safari operates from 9:00 am to 4:00 pm. Jungle safari may also be operated from Thummalabailu to Peddarutla, Thummalabailu to Naramamidi Cheruvu, and Rollapenta.

Wash Room facilities: Wash room facilities are provided for the comfort of tourists.

Wireless Network: The Administrative Building is the controlling point and having Wireless Network to know about the safety of tourists while on safari and in case any help is needed to the tourists during jungle safari.

Souvenir Shop, Cafeteria, Lounge and Gazebo: These are created for the convenience and to cater to the basic needs of visitors, and also to promote NSTR, conservation of forests, and wildlife.

11.3.5.3 Nekkanti Eco-Tourism Zone:

The Nekkanti Jungle Ride (GPS reading N:16.064722, E: 78.956667) is located in Compt. No.371 of Markapur RF of Nekkanti Beat of Nekkanti Range of Project Tiger, Markapur.

The Istakameswari Temple is an ancient temple near to the auspicious place of Srisailam, falls in notified core area Nagarjunasagar Srisailam Tiger Reserve and Nekkanti Jungle Ride of about 8 kms. will reach to the said temple. Nekkanti Jungle

Ride includes 7.5 kms of vehicle ride & 500 meters of Nature Walk to reach Istakameswari Temple. The road is hilly ghat and difficult Terrain and only Commander Jeeps with well-trained drivers can transport the pilgrims to Istakameswari Temple.

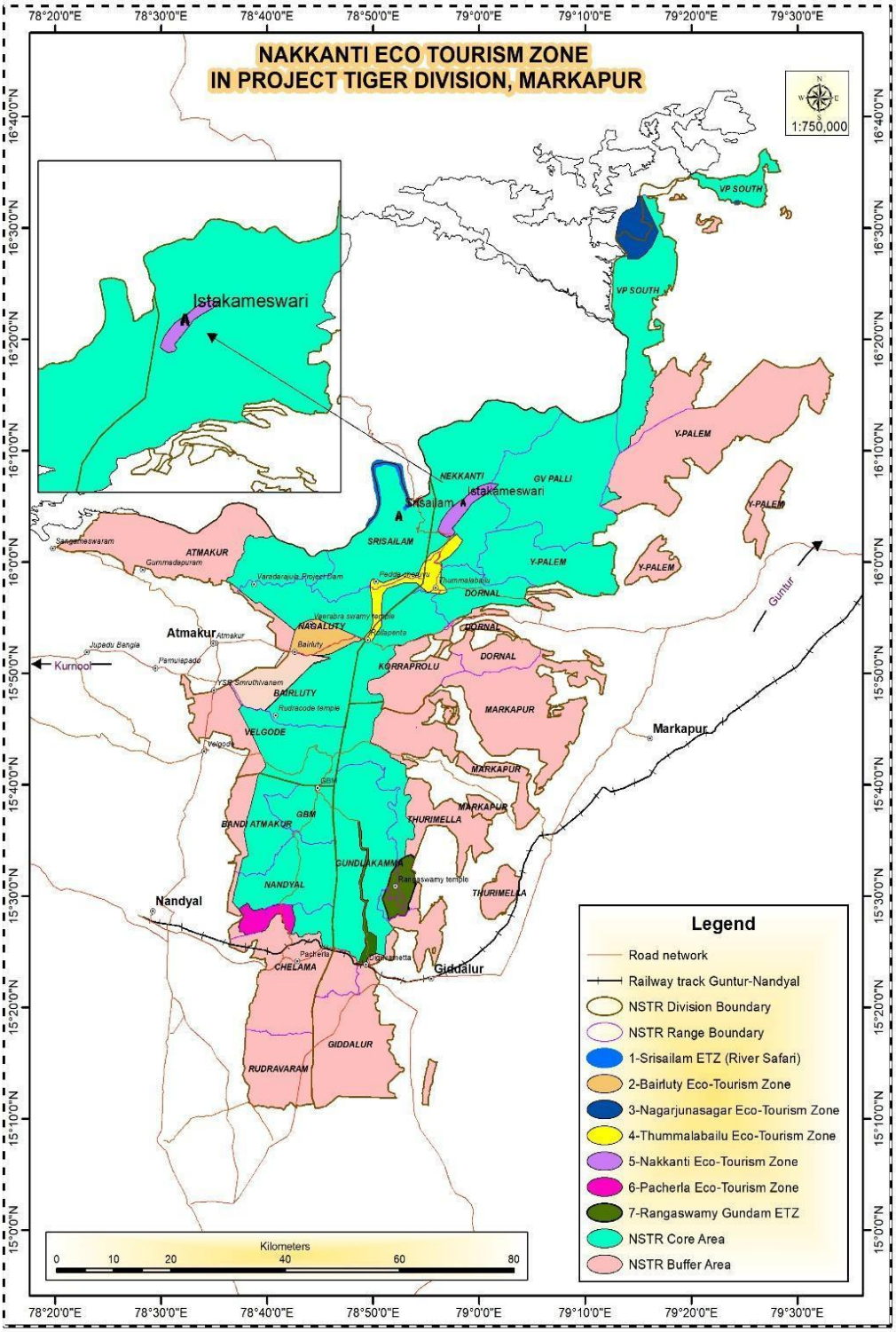
Table 57: Nekkanti Eco-Tourism Zone

Sl. No.	Name of the Segment	Nearest land mark	Beat / Range	Protected area status	Compartments	RF Block
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	Nekkanti Jungle Ride, Nekkanti	Istakameswari Temple, Aarapenta Grass lands, NJR counter, Sikharam	Nekkanti/ Nekkanti	Core area of NSTR	371	Markapur

I. To run it on sustainable basis without damage to the environment and also only the existing infrastructure.

II. To limit the no. of rides to the barest minimum as it is in high density tiger zone.

Map 63: Showing the Nekkanti Eco Tourism Zone in Project Tiger Division, Markapur



11.3.6. Community Based Eco-Tourism in Project Tiger, Nandyal

11.3.6.1 Pacherla Eco-Tourism Zone:

Table 58: Pacherla Eco-Tourism Zone

Sl. N.o	Name of the Eco-tourism site	Nearest land mark	Beat / Range	Protected area status	Compt. Nos.
1	2	3	4	5	6
1	Pacherla Eco-tourism	Pacherla Jungle Safari	Chelama Range	Core of NSTR	565, 566, 567, 568, 526, 527, 514, 536 & 537

* The Proposed activities are not comprehensive and other activities will be included based on the demand.

Pacherla Ecotourism Zone: Pacherla Ecotourism zone is proposed at the boundary of GBM Santuary and hence spread in to core and buffer areas. Only a small fraction of core area is proposed (i.e less than 10%). Majority of the zone is located in the buffer area.

Pacherla Eco-tourism zone in core area of Nagarjunasagar Srisailam Tiger Reserve (NSTR) is proposed over an area of 31.40 sq.km.

Existing Facilities:

Stay in Jungle Camps	**: 8 Cottages and 2 Tents**
Charges at Jungle Camps	: Tents @ 6500/- per Day
	: Cottages @ 6000/- per Day
	: Premium wooden cottages @ 8000/- per Day.
Timings	: Check in 12.00 Noon and Check out: 11.00 am
The charges include package for two (2) members including food and Safari.	

Eco-Trails and Eco-trekking through nature: Visitors are grouped into 5 to 7 persons and a forest guide is provided for taking the visitors group into the jungle. The trekking routes are customized for long and short duration to appreciate the dry deciduous Nallamala forest housing varied variety flora and fauna.

Bird & Butterfly Watching: Visitors are encouraged to utilize the services of trained field guide in appreciating the Avi-fauna habituating the Nallamala forest. In this regard a pictorial guide on “Bird watching trail at Pacherla” is available on purchase at souvenir shop at Pacherla. Watching butterflies flying through the camps during rainy season is mesmerizing to see, feel and to fell in love with the different butterfly species.

Suspension Rope Way Bridge: Suspension Rope Way Bridge is unique and one of such bridges in the Rayalaseema region connecting the cottages and the restaurant in the camps.

Mayuri Jungle Restaurant: Local exotic cuisines are prepared and served according to guest's order and on availability at the jungle camp restaurant.

Cafeteria & Souvenir shop: Modern cafeteria with air-conditioning and other facilities is developed which supplies healthy snacks and beverages to visitors. Souvenir shop includes the goodies like T-shirt, caps, pure honey etc., and also unique artifacts and handi crafts related to local culture and forests.

Jungle Safari: Traversing through the Nallamala Jungle on customized Jungle Safari Jeep and to appreciate the faunal and floral diversity of Eastern Ghats. The Safari ride through the landscape to ancient temples of Mahanandi, Ulleda and to Ahobilam. Apart from this, visitors are also taken to exotic location like excellent bird eye view point at Eagle Base Camp, and to natural water body at Regimanukunta inside the Jungle. The safari traverses through the old railway track more than 25 years old along which lies many heritage locations such Dorabhavi viaduct, Bogada tunnel old railway stations of Chelema and Dullakunta nested in deep interiors of Nalamalla forests.



Tribal Archery and Modern Archery: Visitors are provided with opportunity to enjoy the methodology to use a primitive Tribal archery under the able guidance of tribal person from Chenchu community to experience and appreciate the traditional skill of the tribes. Further, visitors are also given an opportunity to try modern archery and feel the difference between the two.

Sports activities: Visitors staying in camps are provided with sports facilities like Badminton, volley ball etc.

11.3.7. Community Based Eco-Tourism in Project Tiger, Giddalur:

11.3.7.1. Rangaswamy Gundam Eco-Tourism Zone:

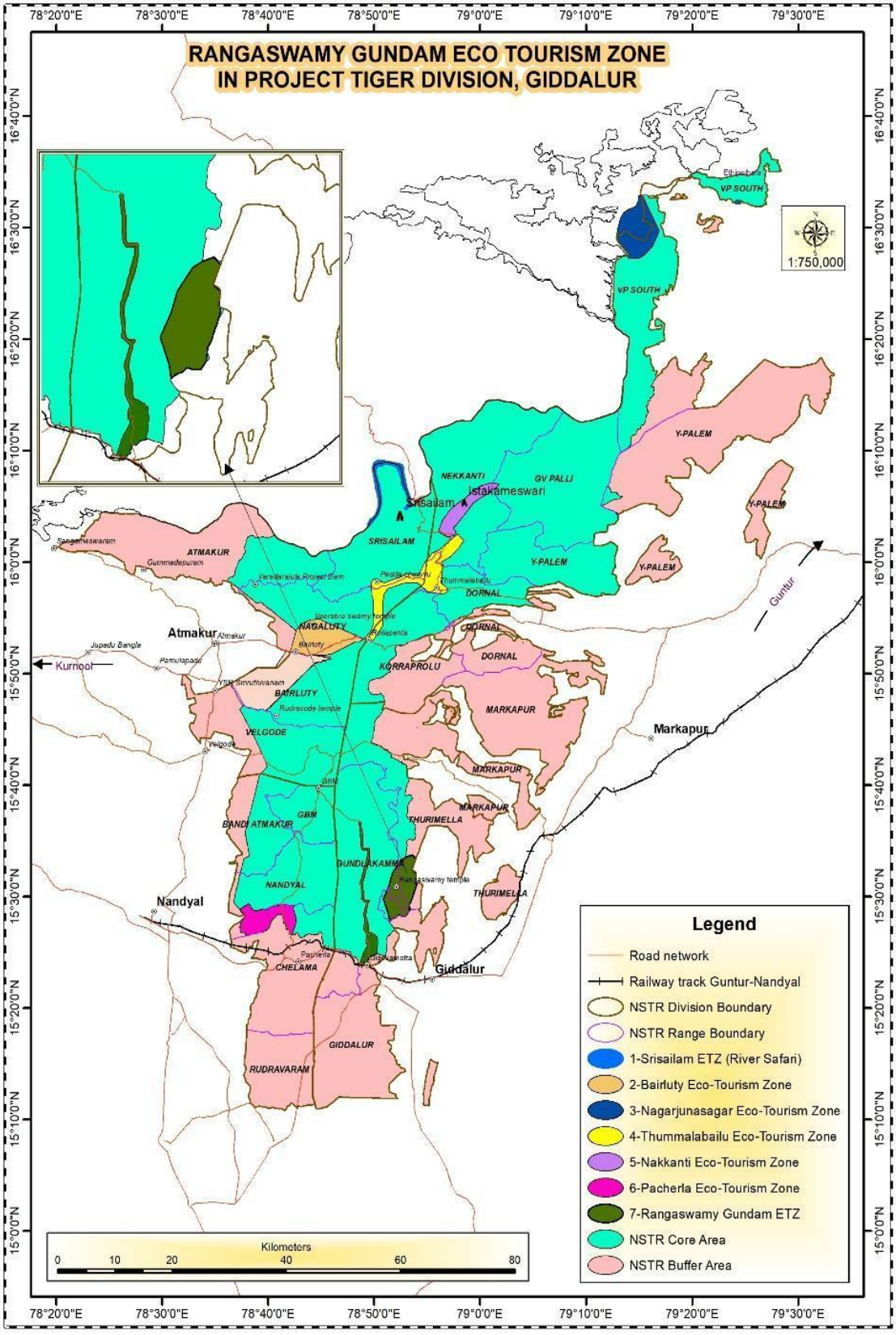
Table 59: Rangaswamy Gundam Eco-Tourism Zone

Sl No	Name of the Segment	Neart land mark	Beat / Range	Protected area status	Compartments	Name of the RF
1	2	3	4	5	6	7
1	Rangaswamy Gundam Eco – Tourism	Diguvametta Jungle Safari and Rangaswamy Gundam Jungle Safari	Diguvametta (North), Diguvametta (South), Malakondapenta , Ambavaram Beat of Gundlakamma Range and J.P.Cheruvu Beat of Turimella Range.	Core and proposed Buffer of NSTR	766, 767, 744,770,771,782,778,720,719,689,690,692,707, 768,778,779 and 782	ENB-I and Cumbum RF

The Proposed activities are not comprehensive and other activities will be included based on the demand.

The area proposed is at present in ENB -I RF and Cumbum RF and a part of extended core of NSTR and proposed Buffer of NSTR.

Map 64: Showing the Rangaswamy Gundam Eco Tourism Zone in Project Tiger Division, Giddalur



Activities/Facilities provided in Rangaswamy Gundam Eco-Tourism Zone:

Jungle Safari: Traversing through the Nallamala Jungle on customized Jungle Safari Jeep and to appreciate the faunal and floral diversity of Eastern Ghats in and around Diguvametta.

Tribal Archery and Modern Archery: Visitors are provided with opportunity to enjoy the methodology to use a primitive Tribal archery under the able guidance of tribal person from Chenchu community to experience and appreciate the traditional skill of the tribes. Further, visitors are also given an opportunity to try modern archery and feel the difference between the two.

Sports activities: Visitors staying in camps are provided with sports facilities like Badminton, valley ball, street cricket etc.,

The check post is established at Mokalla Kuruva location of J.P.Cheruvu beat and Environmental Maintenance Charges are being collcted from vehicles plying to Rangaswamy Gundam temple and Waterfall on Saturdays only. Remaining days the check post and gate will be closed and no pilgrims or vehicles will be allowed to enter. At present, the entry fees collected from the vehicles passing through checkpost is as follows.

Table 60: Vehicle Entry Fees at Mokalla Kuruva Check Post

SI.No	Category	Rate in Rs.
1	Two Wheelers	20
2	Three Wheelers	40
3	Four wheelers	60
4	Tractors	75
5	Heavy Vehicle	200

At present 4 Nos. of Swachch sevaks are working for collection of Garbage all along the road passing through Ambavarm to Rangaswamy Gundam Temple.

11.3.8. Tourism in the Park:

All tourism activities shall take place only in delineated ‘tourism zones’ indicated in the tourism plan. Currently, tourism in the core area consists of stay facilities along with related services, interpretive facilities through which nature/wildlife can be enjoyed and awareness gained, and interesting natural features having significant tourism value. The following generic guidelines have to be followed:

- The Park Management has to ensure that tourism facilities, including all types of accommodations, until moved out of the core area, are maintained properly and upgraded/updated periodically.
- All automatic/computerized programmes installed in the museum complex and orientation centres have to be checked frequently for their optimum performance, in consultation with the Centre for Environment Education, Ahmedabad.
- There is already an excellent forest road network in the ecotourism zone. The road network needs to be maintained properly.
- There is no need to construct any more forest roads, concretized culverts, or causeways in the tourism zone. While too many forest roads give rise to fragmentation, concretized structures obstruct the natural movements of tigers.
- The nature trails should be inspected frequently to ensure there is no defacement of signages, footpaths, towers, etc.
- Various signages and their inscriptions have to be inspected periodically for animal damage or weather-related defacement.
- Proper cleanliness and hygiene should be maintained in the forest canteen.
- Cleanliness and hygiene must also be ensured in and around the forest canteen to reduce the nuisance of crows attracted by food.
- Toilets should always remain clean, with proper use of antifouling, etc.

11.3.9 Temple Tourism in Nagarjunasagar Srisailam Tiger Reserve

The traditional pilgrimages to religious sites are evolving into large-scale religious tourism in many protected areas across India. A growing influx of visitors, leading to infrastructural development of these sites within protected areas, has high potential to immensely damage the natural ecological balance. The Nagarjunasagar Srisailam Tiger Reserve has a large number of temples and places of religious interest in both the Core and Buffer areas. Sri Brahmaramba Mallikarjuna Swamy Temple, one of the 12 Jyothirlingas of the country, is located at Srisailam, which attracts 6–7 lakh pilgrims during the two main festivals, namely Maha Sivarathri and Ugadi, every year.

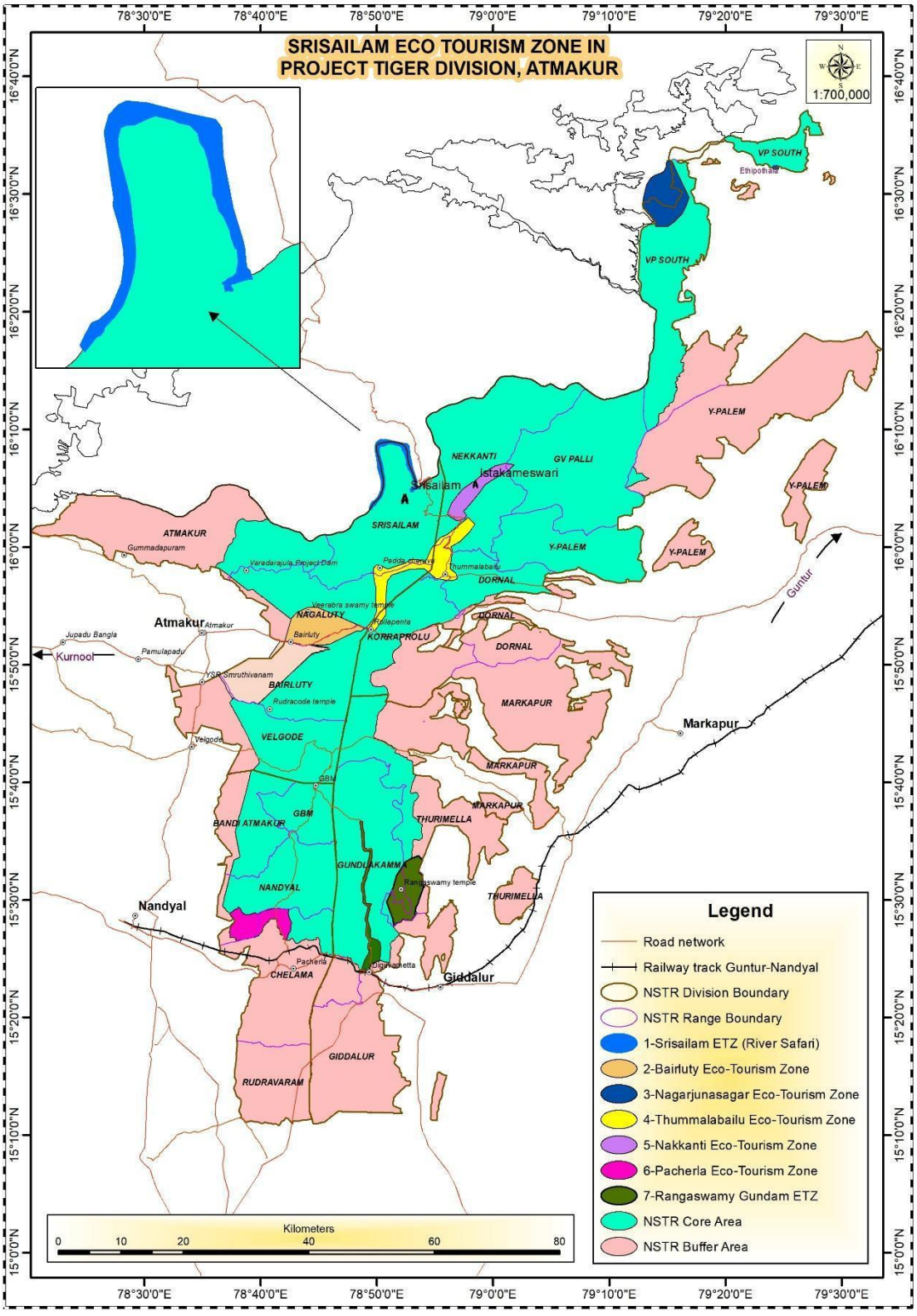
Most of these pilgrims walk through the Nagarjunasagar Srisailam Tiger Reserve, starting at Venkatapuram of Atmakur Division and ending at Kailasadwaram near Srisailam via Pecheruvu. The temple townships (i.e., Srisailam and Srisailam Project Colony, also called Sundipenta) have a resident population of around 50 thousand

individuals. Pilgrims usually start walking through the forest 10 days before each festival. The number gradually increases with each passing day until the commencement of the festival. The number is usually lower for the festival of Maha Sivarathri, while it almost doubles for the Ugadi festival.

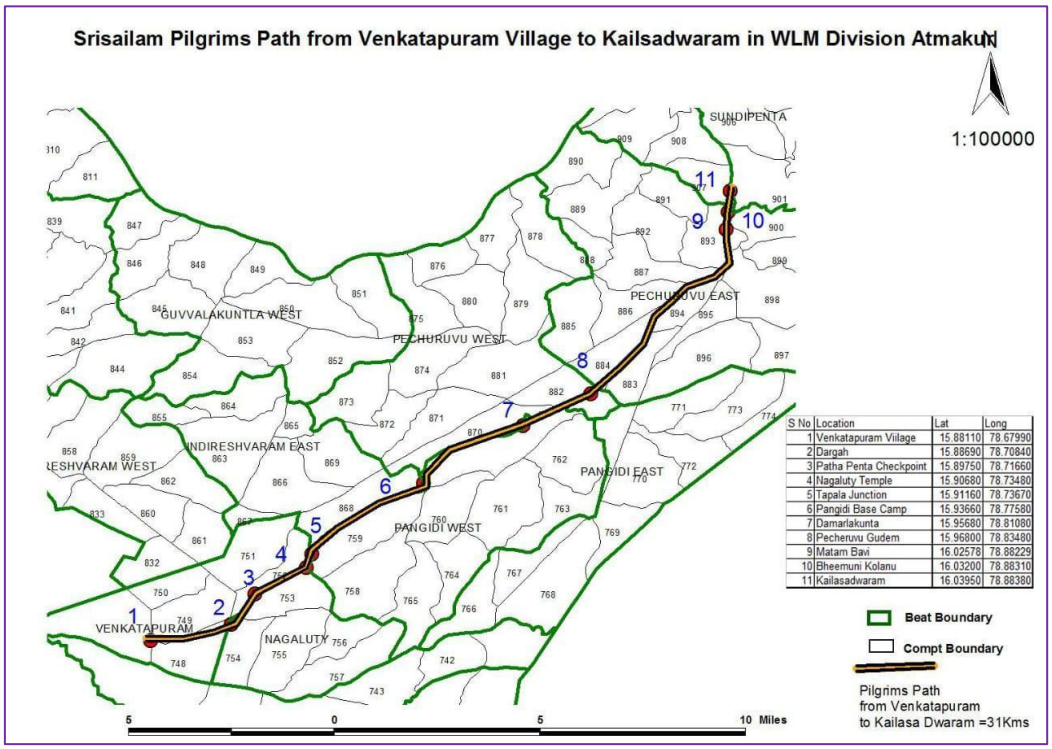
The distance of the walkway from Venkatapuram to Srisailam is 31 km. Pilgrims from the state of Telangana reach the temple via the existing national highway, which is 18 kilometers long. No pilgrimage is allowed during the closure period of the tiger reserve, i.e., from 1st July to 30th October.

Other important temples in the NSTR are Shri Veerabhadraswamy Temple at Naguluty, Rudrakoteswara Swamy Temple at Rudracode, Saraswathi Temple at Kolanubharathi, Lord Shiva Temple at Gundla Brahmeswaram, Saakshi Ganapathi Temple at Srisailam, and Istakameswari Temple.

Map 65: Showing the Srisailam Eco Tourism Zone in Project Tiger Divison, Atmakur



Map 66: Map Showing Pilgrims path from Venkatapuram village to Kailasadwaram



Threats:

Due to pilgrimage of Mahasivarathri and Ugadi seasons huge disturbance occurs in the Tiger Reserve which are

(i) ***Water Pollution***: Dangerous and increasing levels of *E coli* in river water with downstream Indigenous communities reporting dysentery, skin rashes, and food poisoning for months after the festival. This was primarily due to animal sacrifice, defecation, and bathing along the riverbanks.

(ii) ***Waste and Sanitation***: High levels of open defecation, use of plastic particularly plastic carry bags, water bottles etc., and other litter (often consumed by wildlife), throwing the food in the forests which attracts some wild animals and sacrificial remains.

(iii) ***Disturbance to wildlife***: Noise, lights, traffic, large crowds camping and walking through core biodiversity areas;

(iv) ***High fuelwood use and damage to plants from camping:*** Including threat of extinction of many species of flora and fauna in the Reserve,

(v) ***Fire incidence*****:** As the staff cannot control the huge numbers of pilgrims, many places cooking is also observed and due to this fire occurrence is noticed. Fire is huge problem in NSTR as it may extend to vast areas in no time.

(vi) Foot wear: There is practice of leaving footwear near the entrance of the Deity in the Reserved Forest, which accumulates the tonnes of foot wear during the season and the disposal of the foot wear to be made as it is highly dangerous to wildlife if attempts to eat or consumes the foot wear.

An extremely large amount of waste is generated in the two temple townships, as well as along the main roads leading to Srisailam and the pilgrimage foot track. The waste generated has a very large negative impact on the wildlife. The need of the hour is to formulate a Master Plan involving all the stakeholders, i.e., the Srisailam temple authorities, representatives of the two townships, other local bodies, and the Forest Department. The Master Plan should focus on facilitating pilgrims while maintaining the ecological balance in the Tiger Reserve. Issues such as the collection, treatment, and disposal of waste, while providing adequate facilities to pilgrims, should be taken up on a priority basis. The work should be given to a consultancy, and a necessary study should be conducted; based on their report, the NSTR park management should start implementing the recommendations. In the meantime, based on the assessment of the situation, the following measures are being followed, and additional measures are suggested to control the damage to wildlife due to religious tourism in the NSTR.

Current available infrastructure and facilities for the pilgrims:

Food: One week before the start of each festival, donors set up temporary food stalls all along the pilgrimage route.

Drinking water: Drinking water is provided all along the route mainly by the Forest Department. In addition, a number of hand pumps as well as Solar bore wells have been established by the Forest Department.

Medical facilities: Medical camps are set up in six locations (Venkatapuram, Veerabhadra Swamy Temple, Damarla Kunta, Pecheruvu Gudem, Bheemuni Kolanu, and Kailasadwaram) along the route, and ambulances are also deployed during the pilgrim season. A permanent medical camp has been constructed by the Forest Department so that medical personnel can live there throughout the pilgrim season.

Camping facilities: While some pilgrims complete the pilgrimage trek in one day, many choose to complete their pilgrimage in two days. Pilgrims who wish to spend the night in the forest stop at Pecheruvu Gudem. The Forest Department has fixed a solar bore well and constructed shower stalls (separate for ladies and gents) for the pilgrims at Pecheruvu. In addition, the Forest Department installs temporary solar lights all along the pilgrimage route during the pilgrimage season. The Revenue Department provides portable toilets along the pilgrimage route. In addition, camping facilities are also provided before the pilgrims enter the forest at Anjaneyaswamy Temple, Bairluty. Other temporary camping facilities are available at Veerabhadra Swamy Temple, Damarla Kunta, Pecheruvu, and Kailasadwaram.

Garbage collection: During the pilgrimage season, additional garbage watchers are employed by the Forest Department to collect all the waste generated along the pilgrimage route. All donors who provide food to the pilgrims are responsible for collecting and transporting the waste produced to areas outside the Tiger Reserve.

Proposed facilities for the pilgrims and mitigative measures suggested:

a) **Collection of Environmental Maintenance Charges from the pilgrims:** It is proposed to collect environmental maintenance charges from the pilgrims who wish to walk through the Tiger Reserve in the future. Once the rate is decided, proposals may be submitted to the Governing Body of A.P. Tiger Conservation Foundation. The collection of the charges may be done at the entrance of the Tiger Reserve near Anjaneyaswamy Temple in Nagaluty. Infrastructure such as Entrance Arch with gate, Ticket counter, Toilets, drinking water facility etc. may be provided at the entrance. With due permission of the competent authority, NSTR shall create a website for generating **"e Pass"** for paying EMC charges minimum Rs. 100/- or whatever the amount which the Deputy Director or Field Director fixes the amount. The online registration needs to be publicized well in advance in all the leading newspapers in the state, targeting the people from which pilgrims belong to i.e., for Maha Siva Ratri from Andhra Pradesh, Telangana, and Karnataka and Ugadi from Karnataka and Maharastra. The process of registration should start well in advance and sufficient no. of counters are to be arranged at the starting point of Venkatapuram by training the local youth. The new systems in the digital payment methods of Phone pay, Google Pay or UPI method of scanning, people are using

these methods in villages nowadays. This will be implemented with approval of Government.

b) **Improvement of Walking track:** The entire path of the pilgrimage route should be improved especially the following stretches – Veerabhadraswamy Temple to Pangidi Base Camp and Bheemuni Kolanu to Kailasadwaram.

c) **Improvement of temporary camping facilities:** The camping facilities at Pecheruvu Gudem may be improved by provision of Toilet facilities and drinking water to the pilgrims.

d) **Bio-toilets:** A number of bio-toilets (Semi permanent structures) may be temporarily placed along the pilgrimage route especially at the following places - Anjaneyaswamy Temple, Veerabhadra swamy temple, Damarla Kunta, Pecheruvu, Bheemuni Kolanu and Kailasadwaram. These toilets to be removed after the pilgrimage season.

e) **Fire camps along the Pilgrimage path:** A number of temporary fire camps should be established along the pilgrimage route, especially as the major festivals occur during the dry fire season. These camps may be established at Veerabhadraswamy Temple, Pangidi Base Camp, Pecheruvu Gudem, Matam Bavi, and Bheemuni Kolanu.

f) **Waste collection & disposal:** It is proposed to ban the use of single-use plastic inside the Tiger Reserve as per the guidelines of the NTCA. An alternative to single-use plastic water bottles is to be explored and implemented. The ban on plastic bags and single-use plastic water bottles in the Tiger Reserve may be achieved by thorough screening at the entry point of the Tiger Reserve. The use of cloth bags sewn by local women's cooperatives, and glass or earthen bottles for drinking water, needs to be explored.

g) **Straying of pilgrims:** Ensuring that no straying of pilgrims occurs from the designated walking track is important, as many fires are started by pilgrims, and a lot of garbage is also disposed of by them. In addition, pilgrims who wander into the forest are in danger of attacks by wild animals as well as snake bites. This may be achieved by barricades all along the walking track.

h) **Providing funds to the Deputy Director, PT Atmakur by Srisailam Temple authorities:** To facilitate the pilgrims and conduct clean-up drives on the pilgrim route for those passing through Nagarjunasagar Srisailam Tiger Reserve to reach

Sri Bhramaramba Mallikarjuna Swamy Devasthanam, Srisailam, the temple authorities are to deposit an amount mutually agreed upon between the Chief Wildlife Warden and the temple authorities, as per the decision of the concerned authority, with the Deputy Director, Project Tiger, Atmakur (A.P. Forest Department). This amount will be used by the Deputy Director, Project Tiger, Atmakur, to provide facilities to the pilgrims who pass through Nagarjunasagar Srisailam Tiger Reserve on their way to Srisailam. Facilities would include the provision of sanitation, garbage removal, drinking water, medical facilities, and precautions for avoiding human–animal conflict, as well as the development of infrastructure.

i) **Awareness to the Pilgrims:** Design awareness campaigns to be implemented during the pilgrimage and in advance, with faith-based messages linking religious beliefs to cleanliness, purity, and divinity—emphasizing that spoiling the environment is against divinity. Media and social media campaigns, as well as on-ground awareness campaigns, should use faith-based, cultural, and conservation messages. The Department shall plan the awareness activities for villagers and pilgrims well in advance of the commencement of the season.

j) **Coordination with other departments and institutions:** Establish a mechanism with other departments by involving the District Administration along with Revenue, Panchayat Raj, Engineering, Medical and Health, Education, Local Bodies, Religious Institutions, NGOs, Associations of Shopkeepers, Tourism Operators, Village Governing Bodies, and local communities to raise awareness and involve the concerned parties at various levels in controlling the damage caused by the tourism of pilgrims during the season.

k) **Enforcement of rules:** Enforcement of the rules framed for the control of the pollution in the season such as carrying of plastic, alcohol, match boxes, cigarettes by thorough search.

The process of development of religious sites is a hazard to the surrounding forests. Therefore, a ban on further development in terms of construction, development of pilgrimage facilities, and restrictions on the use of nearby natural water bodies for bathing and washing clothes is recommended. At present, the non-biodegradable litter from the temple is either being burnt on-site or dumped into pits; there is no litter disposal mechanism. If religious groups feel their needs and rights are respected, they

can be powerful allies in maintaining the integrity of biodiversity in Indian tiger reserves during pilgrimage events. Meaningful and sensitive communication between government, religious, and civil society actors is not easy to achieve. Despite their reverence for nature, religious and conservation groups typically view and speak about nature in different ways. Efforts should be made to facilitate waste management and minimize the negative impact on nearby areas. Religious tourism inside Protected Areas or NSTR cannot be stopped altogether, as religion is a sensitive issue in India, and Srisailam is one of the 12 Jyotirlingas of India, which people visit increasingly day by day. We should plan accordingly to reduce the pressure by raising awareness about conservation among pilgrims. Mass awareness programs for pilgrims, as well as training for temple management personnel, forest officials, and the local community, would be useful in reducing the disturbance in Protected Areas.

11.4. PARK INTERPRETATION PROGRAMME

Under the Interpretation Programme, 1) Ecological Knowledge Park Sundipenta, 2) Environmental Education Centre Sundipenta, 3) Environmental Education Centre Bairluty and 4) Interpretation Centre Dr.YSR Smruthi Vanam, Nallakalva, and 5) Interpretation Centre, Thummalabailu are used as places for interpretation of wildlife and their conservation.

11.4.1. Environmental Education Centre, Srisailam:

The nature education about the core and buffer area of NSTR is being imparted to students, NGOs, conservationists, lawmakers, and the public by regularly organizing nature camps, awareness trainings, workshops, and through the Environmental Education Centre, Sundipenta in NSTR.

The Environmental Education Centre, located at Sundipenta, has been established to create awareness about conservation among students, pilgrims, and other visitors regarding different aspects of wildlife and conservation. The centre is equipped with a sophisticated audio/video hall, as well as interactive and interpretative facilities to educate and enthuse visitors and enhance conservation awareness among them.

11.4.2. Ecological Knowledge Park, Sundipenta:

Ecological Knowledge Park, located at Sundipenta, is meant for imparting knowledge of evolutionary and ecological processes to visitors, especially students from colleges and schools.

The models of different animal groups in evolution and the interpretation of their eras depict the entire process of evolution, from the Big Bang of the universe to the modern age of mammals. The different stages of evolutionary processes, from the origin of life in the ocean to the dynasty of dinosaurs to the rule of land by mammals, are arranged in sequence to explain, in a nutshell, the gist of evolutionary and ecological aspects. The Ecological Knowledge Park, the first of its kind in a Tiger Reserve in India, has been developed with eco-friendly materials, keeping in mind the concept of minimal disturbance in forests. Apart from this Ecological Knowledge Park, the Ecological Research and Monitoring Lab, otherwise called the Biodiversity Research Centre, Sundipenta, has a good collection of zoological specimens from different taxa, such as fishes, amphibians, reptiles, and mammals. The research scholars of the Biodiversity Research Centre conduct research on biodiversity and conservation aspects. They also provide interpretations about wildlife and conservation to the visitors of the Ecological Knowledge Park and the Biodiversity Research Centre

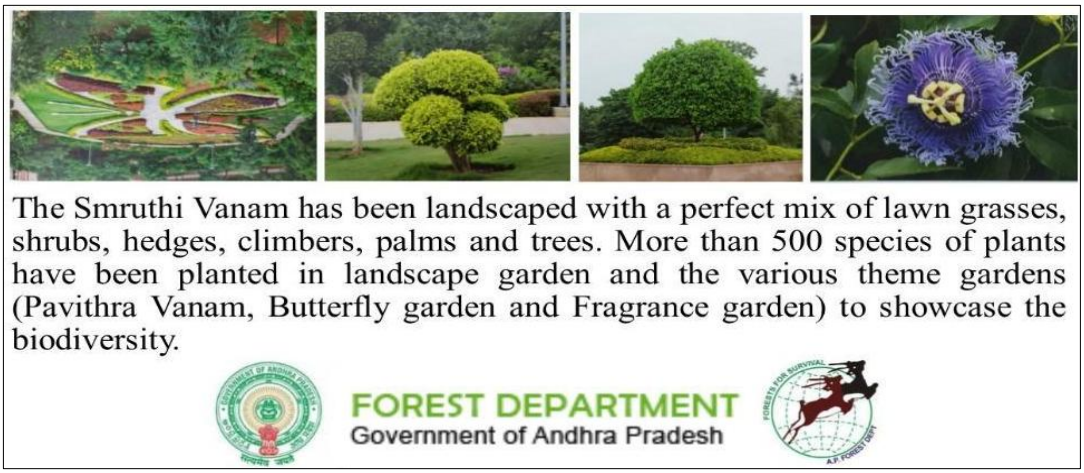




11.4.3 Interpretation Centre, Dr.YSR Smruthi Vanam, Nallakalva:

The Interpretation Centre, located at Dr. YSR Smruthi Vanam, Nallakalva, has been established to create awareness about conservation among students, pilgrims, and other visitors, covering different aspects of wildlife and conservation. It is situated on revenue land adjoining the Tiger Reserve.

The centre is equipped with a sophisticated audio/video theatre with seating arrangements, display boards about the wild animals of Nagarjunasagar Srisailam Tiger Reserve, sculptures of a tiger and a leopard, and interactive and interpretative facilities to educate and enthuse visitors, enhancing conservation awareness among them.



11.4.4 Environmental Education Centre, Bairluty:

Environmental Education Centre located at Community Based Eco Tourism Centre Bairluty has been established for creating awareness about conservation to the Eco-tourists and Students and other visitors about different aspects of wildlife and conservation.

Display boards and Sculptures of various Wild Animals of Nagarjunasagar Srisailam Tiger Reserve are provided. Interactive and interpretative facilities to educate and enthuse the visitors and enhance conservation awareness among them.

11.4.5. Interpretation Centre, Thummalabailu:

An Interpretation Centre, equipped with photographic depictions of flora and fauna, depictions of the lifestyle of Chenchus (Primitive Tribal Group), educative wildlife interpretations, and evidence of wild animals, viz., scat, pellets, eggs, feathers, pug marks, etc., is exhibited in this Centre to create awareness of forests and wildlife conservation. Besides other publicity materials like pamphlets and brochures, souvenirs are also made available for sale to the public. To disseminate knowledge and information on the Nallamalais and NSTR in a lucid and interesting manner, audiovisual aids and robotic technology are used.

11.4.6. Miscellaneous Prescriptions:

- Existing residential infrastructure inside core or critical tiger habitats shall be strictly regulated to adhere to low ecological impacts as decided by the Local Advisory Committee on a site-specific basis.
- Any core area in a tiger reserve from which relocation has been carried out, shall not be used for tourism infrastructure.

- Introduction of special economy tourist vehicles (mini-buses/ canters with 15-20 seats) for day-tourists and school kids to reduce vehicular pressure in the Core Zone. This should be started with one vehicle at every place of Safari in NSTR and increased depending on the no. of visitors.
- The Core Zone should be opened from 1st October as used to be the practice till a few years back. The period of 3months i.e., July to September of every year will be closed for visitors.
- The Reserve Management shall, as far as possible, provide for subsidized visits to students for excursions in the core area and foster educational extension activities.
- The Reserve Management shall carefully monitor and record the impact of tourism activities on wildlife and its habitat. Consultants/ experts from premier institutes/ organizations can also be hired for the assessment of tourism impact. Some indications are suggested as under:
- Recognition of ecotourism operators and provision of awards/ incentives.
- Periodic training programmes on eco-tourism should be conducted for tourism administration, planners, operators, and general public.
- Site-specific microplanning for community based eco-tourism.
- The Management should also regularly monitor and evaluate the impact of tourism on the Core Zone, and visitors' reactions to and feedback on tourism management. However uncomplimentary remarks may sometimes seem, they help to minimize the shortcomings of the Management and improve upon its functioning. Visitors' books kept at different forest rest houses, hutments, dormitory, and interpretation complex, letters, and emails should form a good basis for such evaluation.

11.4.7. Miscellaneous Regulations:

Table 61: Religious Sites to be regulated

Sl. No.	Pilgrim sites	Beat / Range	Compartments	RF Block	Attractions
(1)	(2)	(3)	(4)	(5)	(6)
1	Palanka	Palutla / G.V Palli	367	Markapur	Veerabhadra swamy temple, Palanka
2	Bayanna Sela	Chinnarutla / Nekkanti	95	Markapur	Bayanna sela gudi.
3	Darabailu temple	Regumanupenta	370	Markapur	Darabailu gudi.
4	Katamaraju temple	Gundamcherla	293	ENB-IV	Sri Yenuthala Katamaraju & GangaBhavani temple
5	Daddanala	TR Cheruvu	140	Markapur	Anjaney Temple

All the aforesaid religious tourism sites are flooded with tourists not more than 3 to 4 days in a year. Generally, tourists are visiting the sites on auspicious days relating to the existing deity in the site. There is a prominent need for regulation of the crowd to negate Man-Animal conflict.

Proposed regulations: -

I. All the approach roads to the said sites have to be installed with check posts at the entrance of the forest road manned by protection watchers and managed by field officers.

II. The vehicles going to the temple have to be checked at the entrance of the forest approach road to the site.

III. The minimal environmental maintenance charges shall be charged at the tourists to clean the forest areas immediately after the occasion.

IV. Any form of single use plastics such as single use covers, wrappers, plates, spoons, forks and water bottles etc., shall be prohibited at the entrance. Instead eco-friendly products manufactured by the local tribal population shall be encouraged to be supplied and common drinking water facility through tankers and RO system shall be arranged by the Temple authorities / concerned devasthanams.

V. All tourists shall be sensitized not to dwell in the forests except the right of way and not to smoke, eat, consume alcohol etc.,.

VI. It is the responsibility of Temple authorities / concerned devasthanams to keep the forest area clean after the occasion under the supervision of authorities of Forest Department.

VII. The penalty against the violations shall be strictly enforced.

VIII. Any other instructions / guidance given by the Field Director & the Deputy Director shall be adhered to.

CHAPTER 12

Miscellaneous Issues



12.1. ELEPHANT CAMP FOR PATROLLING

12.1.1. Housekeeping of Departmental Elephants:

There are interior and inaccessible areas in NSTR; such areas cannot be perambulated by vehicles and are strenuous to patrol on foot. Therefore, elephant camps for strengthening protection can be established. The elephant camps may be established in places with sufficient water availability throughout the year. The following elephant camps are proposed in the current Tiger Conservation Plan:

- Bairluty (Project Tiger, Atmakur)
- Peddacheruvu (Project Tiger, Atmakur)
- Velgode (Project Tiger, Atmakur)
- GBM (Project Tiger, Nandyal)
- Chlelama (Project Tiger, Nandal)

- Malakondapenta (Project Tiger, Giddalur)
- Peddapenta (Project Tiger, Markapur)
- Darabailu (Project Tiger, Markapur)

Each camp will have a minimum of 2 elephants and a maximum of 3 elephants.

Elephant camps are important for

- Regular patrolling, especially in inaccessible areas
- Capture of injured and subsequent treatment of large carnivores
- Tranquilization of large carnivores like tiger, leopard and omnivores like bears.
- Capturing of Guar from Wild for reintroduction programme.

For establishment of each camp a budget provision of around 50 lakhs may be set aside. If the tiger reserve authorities feel that more number of camps are required, the same may be established with permission of the competent authority. When elephant camps are established, provision should be made for adequate care such as food, water, shelter, veterinary care, handlers (*mahouts, kavadas)* etc.

12.1.2 Amenities for Elephants:

The following structural requirements will be needed for elephants:

- Elephant Shed
- Elephant kraal
- Elephant pool for bathing
- Feeding platform
- Storage Room
- Laboratory for routine checkups

12.1.3 Amenities for Staff and Welfare Measures:

12.1.3.1. Residential buildings for families:

Many of the frontline staff stay in the interior areas away from families. A family accommodation is proposed for such staff at convenient places where schools and other facilities are available.

12.1.3.2. School buses:

School buses are proposed for children of staff, including of STPF, to go to nearby towns for higher education.

12.2. GIS Management: -

Presently there is no GIS facility available in the office. It is proposed to establish GIS facility for effective management. It is proposed to purchase a Work Station and necessary software for this purpose. It is also proposed to provide field staff with devices like M-STrIPES mobile.

12.3. WILDLIFE HEALTH MONITORING

As per S-33-A of the Wildlife (Protection) Act, 1972, the livestock kept in or within 5 km of the Sanctuary are required to be immunized, and hence, the cattle are vaccinated regularly with the help of the District Animal Husbandry Officer. This is to ensure to keep the wildlife free from contagious diseases spread from domestic animal.

Body Condition Scoring:

This will be introduced in this project area. The field staff will be asked to observe and monitor the general body condition of wild animal during their field visits. The frontline staff will be trained by veterinary officer of this project regarding the Body Condition Scoring of wild animals. They will be asked to fill information in prescribed format is as below:

The format for evaluating Body Condition Score of wild animals

Name of the PA ……. Species ……
Division ……. Date ..……..
Range ……. Comp. /Survey No. ……

Age	Sex	Score given for observation of different Body parts									Total score	Remarks
		1	2	3	4	5	6	7	8	9		

Note:- 1) Shoulder, 2) Ribs, 3) Pelvic, 4) Vertebral column, 5) Abdomen, 6) Tail, 7) Body Posture, 8) Skin, 9) Locomotion

Score determination 1) 0-4 Best, 2) 5-7 Good, 3) 8-10 Poor. From this score general health condition of the wild animal will be ascertained.

The general condition will be observed and the health of wild animal will be determined by from 1) general appearance and behavior, 2) bone structure and joints, 3) moist nostrils, 4) jaw, teeth and mouth, 5) ribs, 6) chest, 7) vertebral column, 8) limbs and its locomotion, 9) skin appearance.

On the basis of above observatory parameters from distance the general health of animal can be predicted this will help us to monitor the health status of wild animal at different location and time. Fortunately, there is no history of any major disease to wildlife in the area. Any suspicious death of wild animal is checked with the help of local veterinary officers.

12.3.1 Vaccination of Cattle:

Vaccination of cattle of villages in and around the Protected Area is done to prevent the spread of any epidemics and no cattle is allowed to pass through the Reserve unless they are vaccinated and a certificate is issued by the competent Animal Husbandry Officer to create an immunization buffer. Immunization camps have been organized from time to time for domestic cattle through village panchayats and by involving NGOs in order to prevent the spread of foot and mouth diseases etc., to wildlife.

12.3.2 Tests to be done: -

Periodically to identify the intestinal parasites among the wild animal's tests are conducted using Floatation technique and Sedimentation technique. Urine analyses are also carried out randomly to assess the health of wild animals.

12.3.3 Wildlife Dispensary Staff & Inventory

A Wildlife Dispensary, staffed by two (2) qualified Veterinarians, one (1) Para-vet, Wildlife Protection and Rescue Party (WPRP) four (4) members, a Driver, etc., was established in the year 2020-21 in Project Tiger, Atmakur. This team is responsible for monitoring wildlife as well as mitigating human-wildlife conflict. The team also undertakes the rescue and rehabilitation of wildlife.

All four divisions in Nagarjunasagar Srisailam Tiger Reserve (NSTR) have a separate Wildlife Rescue Van. Each van is equipped with the emergency equipment required for rescuing wildlife.

Table 62: - Trap cages available in Wildlife dispensary, Bairluty

Cage No.	Type of Cage	Utility	Length (cm)	Breadth (cm)	Height (cm)
1	Trap cage (Camouflage)	Tiger & Leopard	210	120	120
2	Trap cage	Leopard	260	120	110
3	Trap cage	General purpose	190	123	122
4	Trap cage		260	117	123
5	Transport cage	Sambar deer	200	120	163
6	Transport cage	leopard	210	117	117
7	Crocodile cage	Crocodile	250	104	77
8	Monkey cage	Monkey	153	123	62
9	Bait unit (transport cage)	Leopard	95	122	122
10	Big bird cage	Birds	61	50	65
11	Bird cage	Birds	30	30	30
12	Bird cage	Birds	30	30	30
13	Bird cage	Birds	30	30	30
14	Bird cage	Birds	30	30	30
15	Bird cage	Birds	30	30	30
16	Bird cage	Birds	30	30	30
17	Bird cage	Birds	30	30	30
18	Bird cage	Birds	30	30	30
19	Monkey cage	Monkey	159	76	52
20	Transport cage	Leopard	210	117	117
21	Trap cage	Leopard	262	107	121
22	Trap cage	Small mammals	160	75	90
23	Transport cage (camouflage)	Small animals	107	119	123

Table 63: - Rescue operations conducted during 2022-23

Sl. No.	Date of Admission / intervention	Species	Stage / Age	Sex	Place of rescue	Cause of displacement	Type of intervention
1	07 April 2022	Bonnet Macaque	Adult	Male	AP Model School, Velugodu	Scavenging for food	Trap Cage
2	07 April 2022	Bonnet Macaque	Adult	Male	AP Model School, Velugodu	Scavenging for food	Trap Cage
3	07 April 2022	Bonnet Macaque	Adult	Male	AP Model School, Velugodu	Scavenging for food	Trap Cage
4	07 April 2022	Bonnet Macaque	Adult	Male	AP Model School, Velugodu	Scavenging for food	Trap Cage
5	07 April 2022	Bonnet Macaque	Adult	Female	AP Model School,	Scavenging for food	Trap Cage

					Velugodu		
6	07 April 2022	Bonnet Macaque	Adult	Female	AP Model School, Velugodu	Scavenging for food	Trap Cage
7	07 April 2022	Bonnet Macaque	Adult	Female	AP Model School, Velugodu	Scavenging for food	Trap Cage
8	07 April 2022	Bonnet Macaque	Adult	Female	AP Model School, Velugodu	Scavenging for food	Trap Cage
9	07 April 2022	Bonnet Macaque	Neonate	Male	AP Model School, Velugodu	Scavenging for food	Trap Cage
10	11 April 2022	Sloth Bear	Adult	Male	Devanakonda, Adoni	Accidental entry into human habitat	Driving into trap cage
11	10 May 2022	Leopard	Adult	Male	Reservoir gate, Pothireddypadu	Settled adjacent to human habitat	Driving into jungle
12	30 May 2022	Sloth Bear	Adult	Male	Banakacherla village nearby, Atmakur	Accidental entry into human habitat	Chemical immobilization
13	03 June 2022	Spotted Deer	Adult	Female	Erragudur village, Velugodu	Accidental entry into human habitat	Rope caught
14	03 June 2022	Tiger	Adult	Male	Prathipadu village, Rajamundry	Settled adjacent to human habitat	Monitoring
15	09 June 2022	Spotted Deer	Neonate	Male	Velugode Range, GBM sanctuary	Abandoned	Hand caught
16	15 June 2022	Spot Bellied Eagle Owl	Senile	Unidentified	Nagaluty Range, NSTR	Sick or injured	Hand caught
17	22 June 2022	Wild Boar	Sub adult	Female	Banamukkala village nearby, Atmakur	Fell inside a well	Cage float
18	26 June 2022	Ruddy Mongoose	Neonate	Female	YSR Smriti Vanam	Abandoned	Hand caught
19	27 June 2022	Sloth Bear	Adult	Female	Erragudur village, Velugodu	Scavenging for food	Trap Cage
20	30 July 2022	Indian Peafowl	Adult	Female	Sankirenipalli, Nandyal	Feral predator attack	Hand caught
21	01 Aug 2022	Common langur	Neonate	Female	Sundipenta town	Orphaned, Sick or injured	Hand caught

22	14 September 2022	Bonnet Macaque	Adult	Male	Sundipenta Reservoir	Sick or injured	Hand caught
23	21 September 2022	Indian Rock Python	Adult	Male	Electric Sub Station, Sundipenta	Sick or injured	Hand caught
24	02 September 2022	Spotted Deer	Adult	Female	Ganapathi Check post, Dornala	Sick or injured	Hand caught
25	11 Oct 2022	Indian Pangolin	Adult	Female	VP South Range, Markappur	Poached	Hand caught
26	28 Oct 2022	Indian Rat Snake	Adult	Female	Sai Balaji School, Markapur	Accidental entry into human habitat	Snake bag
27	20 Nov 2022	Montagu's Harrier	Juvenile	Male	Markapur	Sick or injured	Hand caught
28	27 Nov 2022	Cobra	Adult	Unidentified	Ganapathi Check post, Dornala	Settled adjacent to human habitat	Snake bag

12.3.4 List of equipment in Wildlife Dispensary, Bairluty:-

Equipment available in the Wildlife Dispensary, Bairluty. Efforts are made to ensure that all facilities required for the Rescue, treatment and rehabilitating of wild fauna are present in the Wildlife dispensary.

A. Operation Room
Operation Table
Patient Monitor
Autoclave
Medicine Trolley

B. Clinical Laboratory
Microscope
Centrifuge
Deep Freezer
Cryo-Freezer
Sample Storage Area
Work Table

C. Doctor's Office
Doctor's Desk
Computer Set With Table
Locker
Notice Board

D. Hall
Refrigerator For Anti-Venom & Vaccine
Personal Protective Equipment– Hand Sanitizer, Foot Wear, Gloves, Facemask, Head Cover, Etc.

E. Mobile Rescue Vehicle

F. Field Rescue Equipments
Nets
Night Vision Binocular
Camera Traps – Infrared/Flash
Microchips With Scanner
Portable Loud Speaker With Microphone
Rescue Safety Suits
Walkie-Talkies
Rechargeable Led Lights
Metal Detector
Stretcher
Handy Cam
Thermometers
Surgical Kit
Animal Rug
First Aid Kit
Anti-Bite Gloves
Foldable Chairs
Vaccine/Sample Transporting Containers (Cold Chain)
Search Lights
Tool Kit Box

Post Mortem Kit

Treatment Kit

Snake Rescue Kit

12.4. MORTALITY SURVEY

Whenever mortality of any wildlife is noticed, the concerned field staff immediately informs the Forest Range Officer. The field staff is instructed to report about the death of wild animals whether suspicious or natural to the nearest senior officer. To the extent possible the postmortem of the dead animal is being carried out by the local Veterinary Doctor of Zilla Parishad or States Government. The case of death reported by the veterinary officer also helps in investigation of death of wild animal. A regular monthly return of mortality of wild animals along with cause of death is submitted to Principal Chief Conservator of Forests (Wildlife).

12.4.1. Post Mortem Summary from April 2022 onwards in NSTR

Table 64: - Postmortem summary from April, 2022 onwards in NSTR

Sl. No.	Date	Species	Stage of growth	Sex	Place of death	Range	Cause of Death
1	08-04-2022	Crocodile	Adult	Female	VRSP Dam	Nagaluty	Internal injuries from in-fighting
2	13-04-2022	Sambar Deer	Adult	Male	Sikharam Check post	Srisailam	Hypovolumic Shock
3	14-04-2022	Spotted Deer	Adult	Male	Peddamanthanala	Dornala	Hypovolumic Shock
4	20-04-2022	Black Buck	Sub adult	Male	NH 765 Ganapathi check post	Dornala	Hemorrhage and Hypovolumic Shock
5	24-04-2022	Palm Civet	Adult	Female	Chilakacharla, Dornala	Dornala	Hypovolumic Shock
6	25-04-2022	Wild Boar	Adult	Female	Gantamatam, Srisailam	Srisailam	Stomach Impaction
7	25-04-2022	Wild Boar	Adult	Male	Yenugula Cheruvu, Srisailam	Srisailam	Unidentified
8	07-05-2022	Wild Boar	Adult	Male	Srisailam By-pass road	Srisailam	Hypovolumic Shock
9	10-05-2022	Tiger	Adult	Female	P A Puram North Beat	Bairluty	Unidentified
10	25-05-2022	Wild Boar	Sub adult	Male	Bandlakunta, Velugodu road	Velugodu	Hemorrhage and Hypovolumic Shock
11	25-05-2022	Spotted Deer	Adult	Male	Ramayagunta base camp	Bairluty	Hemorrhage and Hypovolumic Shock
12	21-06-2022	Spotted Deer	Juvenile	Male	Sundipenta Animal Orphanage	Srisailam	Internal Congestion and Hemorrhage
13	30-06-2022	Ruddy Mongoose	Infant	Female	Wildlife Dispensary	Nagaluty	Hemorrhagic Hastroenteritis
14	17-07-2022	Spotted Deer	Adult	Female	Sundipenta Animal Orphanage	Srisailam	Traumatic shock from in-fighting

15	17-07-2022	Wild Boar	Juvenile	Male	Srisailam By-pass road	Srisailam	Dehydration from severe diarrhea
16	31-07-2022	Indian Peafowl	Adult	Female	Wildlife Dispensary	Nagaluty	Congestion and Shock
17	09-08-2022	Tiger	Adult	Female	Buggalavagu	Velugodu	Severed spinal cord, disconnecting brain from the body
18	22-08-2022	Wild Boar	Adult	Female	Srisailam	Srisailam	Multiple cardiac affections from fatty tumerous overgrowth
19	09-09-2022	Black Buck	Adult	Female	Kokkerancha village, Pamulapadu	Atmakur	Unidentified
20	19-09-2022	Common Langur	Infant	Female	Wildlife Dispensary	Nagaluty	Dehydration from severe diarrhea
21	26-09-2022	Indian Rock Python	Adult	Female	Wildlife Dispensary	Nagaluty	Electrocution, paralysis
22	02-10-2022	Spotted Deer	Adult	Female	Ganapathi check post, Dornala	Dornala	Hemorrhage and Hypovolumic Shock
23	04-10-2022	Wild Boar	Juvenile	Female	Rajaka Sathram Srisailam	Srisailam	Unidentified
24	07-10-2022	Wild Boar	Juvenile	Male	Srisailam Annadhanam sathram	Srisailam	Hemorrhage and Hypovolumic Shock
25	17-10-2022	Wild Boar	Juvenile	Male	Gantamatam, Srisailam	Srisailam	Foreign body obstruction
26	19-10-2022	Wild Boar	Sub adult	Male	BC Colony, Srisailam	Srisailam	Multiple - Respiratory failure and Foreign body Obstruction
27	19-10-2022	Wild Boar	Sub adult	Female	BC Colony, Srisailam	Srisailam	Unidentified
28	29-10-2022	Wild Boar	Sub adult	Female	Near temple annadhanam area	Srisailam	Hemorrhage and Hypovolumic Shock
29	30-10-2022	Wild Boar	Sub adult	Male	Kothapeta, Srisailam	Srisailam	Unidentified
30	10-11-2022	Common Langur	Adult	Female	100 Cottage, pathala ganga road	Srisailam	Hypovolumic Shock
31	10-11-2022	Common Langur	Juvenile	Male	100 Cottage, pathala ganga road	Srisailam	Hypovolumic Shock
32	15-11-2022	Spotted Deer	Old age	Male	Animal Orphanage, Sundipenta	Srisailam	Respiratory Failure
33	15-11-2022	Wild Boar	Juvenile	Male	Filter house, Srisailam	Srisailam	Septic shock
34	17-11-2022	Sloth Bear	Old age	Male	Chinna manthanala	Korraprolu	Unidentified
35	20-11-2022	Small Indian Civet	Adult	Female	Atmakur-Dornala Road	Bairluty	Hypovolumic Shock
36	27-11-2022	Wild Boar	Old age	Male	Munuswamy Ashramam	Srisailam	Unidentified
37	03-12-2022	Sloth Bear	Old age	Female	TGP canal	Velugodu	Unidentified
38	04-12-2022	Wild Boar	Adult	Female	ST School, Sundipenta	Srisailam	Asphyxia
39	12-12-2022	Wild Boar	Juvenile	Male	Smriti Vanam	Velugodu	Hemmorhage and Hypovolemia
40	13-12-2022	Spotted Deer	Adult	Male	Adjacent to Smriti vanam	Velugodu	Shock

41	16-12-2022	Wild Boar	Adult	Female	Kothapeta, Srisailam	Srisailam	Foreign body obstruction
42	21-12-2022	Common Langur	Adult	Female	AP GenCo Quarters, Sundipenta	Srisailam	Hypovolumic Shock
43	24-12-2022	Indian Peafowl	Adult	Female	Nallakalva village, Bairluty	Bairluty	Unidentified
44	03-01-2023	Wild Boar	Adult	Male	BC School, Sundipenta	Srisailam	Unidentified
45	14-01-2023	Small Indian Civet	Old age	Uniden tified	Chinna Gummitham temple, Nagaluty	Nagaluty	Unidentified
46	16-01-2023	Leopard	Adult	Male	SRBC sub channel, Ramatheertham to Gonavaram road, Ramatheertham Beat	Panyam	Unidentified

The recording of deaths of major wildlife should be continued. Post-mortems of all death cases of major wildlife should be carried out. After a post-mortem, as per the SOP of NTCA, samples are sent to various recognized laboratories such as CCMB, TANUVAS, SVVU, VBRI, etc., for histopathology, virology, bacteriology, phylogenetic studies, DNA profiling, and DNA analysis.

CHAPTER 13

Organization, Administration and Budget



INTRODUCTION: -

The Government of Andhra Pradesh constituted the State Wildlife Board under section 6 (1) of Wildlife (Protection) Amendment Act, 2002 *vide* G.O Ms No 92, EFS and department Dated.5.11.2003.

13.1. TIGER STEERING COMMITTEE

(1) The State Government shall constitute a **'Steering Committee'** under section 38U of The Wildlife (Protection) Amendment Act, 2006' for ensuring the co-ordination, monitoring, protection and conservation of tiger, co-predators and prey animals within the State of Andhra Pradesh.

(2) The steering committee shall consists of –

(a) the Chief Minister – **Chairperson**;

(b) the Minister–in–charge of Wildlife – **Vice-Chairperson**;

(c) such number of official members not exceeding five including the Field Director of Tiger Reserve or Director of National Park and one from the State government's departments dealing with tribal affairs;

(d) three experts or professionals having qualification and experience in conservation of wildlife of which at least one shall be from the field of tribal development;

(e) two members from the State's Tribal Advisory Council;

(f) one representative each from the state government's departments

(g) dealing with Panchayat Raj and Social Justice and Empowerment;

(h) Chief Wildlife Warden of the State shall be the Member-Secretary, ex- officio, to be notified by the State Government, in the Official Gazette.

The Field Director has submitted the proposal for constituting the Tiger Steering Committee to the Chief Wildlife Warden who in turn will request the State Government for constitution of the Tiger Steering Committee vide Ref No.2266/2017/PT.4, dt. 21.02.2018 & 30.08.2023.

13.2 ADVISORY COMMITTEE

The State Government shall constitute an "Advisory Committee" as per Section 33B of Wildlife (P) Act, 1972. It will be consisting of the Chief Wildlife Warden or the Conservator of Forests and the Field Director, Project Tiger as its head

It shall include

- A member of the State Legislature within whose constituency the NSTR is situated,
- Three representatives from the Panchayat Raj Institutions,
- Two representatives from N.G.O,
- Three individuals, active in the field of wildlife conservation,
- One representative each from the departments dealing with home and veterinary matters,
- 'Honorary Wildlife Warden',
- Officer-in-charge of the NSTR, as Member Secretary.

The committee shall render advice on measures to be taken for better conservation and management of the core area including participation of the people living with and around the core area. Advisory committee is under proposal stage.

13.3 TIGER CONSERVATION FOUNDATION

Under the provisions of Sec. 38 X of Wildlife (Protection) Act, 1972 (53 of 1972) Central Govt. made guidelines for the purpose of regulation of Tiger Conservation Foundation *vide* the Gazette of India Notification extraordinary Part-II Section-3, Sub Section -(ii) No. 748, New Delhi, Friday, June 22, 2007/ASADHA 1, 1929 S.O. 1008(E) Section-3 Constitution of Tiger Reserve Foundation. as per the Government orders vide G.O. Ms No.143 Environment, Forests, Science & Technology (For-II) Department, Dated: 15.12.2007, Tiger Conservation Foundation was constituted for Nagarjunasagar Srisailam Tiger Reserve in Andhra Pradesh in order to facilitate and support the management for conservation of tiger and bio-diversity and to take initiatives of eco-development by involvement of people and also for expeditious utilization of the funds released by Government of India, as well as State Government. The Government have accorded permission under Section 6 (2) (b) of Andhra Pradesh Societies Registration Act, 2011 to use the name of the Andhra Pradesh in the name of the Society to be registered with the name Andhra Pradesh "Tiger Conservation Foundation".

Further, the Government have nominated the Governing Body of the foundation vide G.O. Rt. No.210 Environment, Forests, Science & Technology (For-II) Department, Dt: 2.5.2008 & G.O Rt. No.259, Environment, Forests, Science & Technology (For-II) Department, Dt: 27.05.2008 as furnished below:

Table 65: Committee for the Governing Body

1	Special Chief Secretary / Principal Secretary / Secretary to Govt., Environment, Forests, Science & Tech Dept, AP	Chairperson/ Chairman
2	Special Chief Secretary / Principal Secretary / Secretary to Government, Finance Department, A.P.	Member
3	Principal Chief Conservator of Forests, A.P.	Member
4	Chief Wildlife Warden, A.P.	Member
5	Special Principal Chief Conservator of Forests/ Additional Principal Chief Conservator of Forests (Dev & CSS) A.P.	Member
6	Additional Principal Chief Conservator of Forests (WL)/ Chief Conservator of Forests (WL) A.P.	Member
7	Field Director, (Project Tiger) Srisailam	Member Secretary

Extract of Wildlife (protection) Act 1972.

Sec. 38 X: Establishment of Tiger Conservation Foundation: (1) State Government shall establish a Tiger Conservation Foundation for tiger reserves within the State in order to facilitate and support their management for conservation of tiger and biodiversity and, to take initiatives in eco development by involvement of people in such development process.

(2) The Tiger Conservation Foundation shall, inter alia, have following objectives:

(a) to facilitate ecological, economic, social and cultural development in the tiger reserve;

(b) to promote eco-tourism with the involvement of local stake-holder communities and provide support to safeguard the natural environment in the tiger reserve;

(c) to facilitate the creation of, or maintenance of, such assets as may be necessary for fulfilling the above said objectives;

(d) to solicit technical, financial, social, legal, and other support required for the activities of the foundation for achieving the above said objectives;

(e) to augment and mobilize financial resources including recycling of entry and such other fees received in a tiger reserve, to foster stake-holder development and eco-tourism;

(f) to support research, environmental education and training in the above related fields.

Introduction for Collection of Environmental maintenance Charges: The road from Hyderabad to Srisailam and Guntur/Kurnool to Srisailam passes through the core area of Nagarjunasagar Srisailam Tiger Reserve, the entry point being Mannanur from Hyderabad side and Dornala from the other side. The traffic is prohibited on this road from 9.00 P.M. to 6.00 A.M. and during non-prohibited hours, lot of tourists/Pilgrims pass through these roads in different type of vehicles on their way to Srisailam temple. During festival times, the number of vehicles passing through these roads becomes very high and due to use of the roads by such large number of vehicles and pilgrims, a lot of litter and garbage is generated on the road sides, which are very harmful to the health of the wildlife. Instances of plastic bags containing food articles dispensed by the tourists and ingested by the wild herbivores and these plastic bags getting lodged in the rumen of these animals and becoming fatal have been noticed. Due to heavy

accumulation of such litter and garbage it is becoming very difficult to clean litter and garbage on day-to-day basis as sufficient monetary resource is not available for engaging people for the cleaning work and it is desirable to keep the core area totally litter and garbage free for conservation of wildlife.

Further, the Government have issued orders for collection of Environmental Maintenance Charges for the vehicles passing through Tiger Reserve areas and accorded permission to levy Environmental maintenance charges for the vehicle passing through Nagarjunasagar Srisailam Tiger Reserve at the rate of Rs.20/- per heavy vehicle (buses and lorries) and Rs.10/- per light vehicle (Toofans, Tempos, Cars and Vans) except Government vehicles vide G.O Ms. No.56, Environment, Forests, Science & Technology (For-II) Department, Government of Andhra Pradesh, dt.28.05.2014. Further, the Governing Body meeting held on 22.10.2019 agreed for increasing the Environmental Maintenance charges for light vehicles from Rs. 20/- to Rs.50/- and Rs. 50/- to Rs. 100/- for heavy vehicles with effect from 01.11.2019. The details are as follows.

Table 66: Environmental Maintenance charges

Sl No	GOs/Approved Minutes	Heavy vehicles (buses and lorries)	Light vehicles (Toofans, Tempos, Cars and vans)	Implementation commenced from
1.	G.O.Ms. No. 56 EFS&T (For-II) Dept., dt. 28.05.2014	20/-	10/-	03.06.2014
2.	Approval of the Governing Body minutes of the meeting on 09.09.2016	50/-	20/-	01.10.2016
3.	Approval of the Governing Body minutes of the meeting on 22.10.2019	100/-	50/-	01.11.2019
4.	Approval of the Governing Body minutes of the meeting on 13.08.2024	130/-	70/-	01.09.2024

Objectives of collecting environmental maintenance charges:

To control the adverse impact of the vehicular traffic in the core area of the Tiger Reserve and to take up certain measures like deploying mobile patrol parties to keep check on speeding vehicles, clearance and disposal of litter along the highway, setting up of speed breakers to avoid accidents to wild animals crossing the roads, putting up sign boards, caution boards to maintain speed limit. These activities will be taken with

the proposed fee collected from various vehicles passing through the Tiger Reserve and the amount so collected will be deposited in Tiger Conservation Foundation of Andhra Pradesh which was registered with the Registrar of Societies, Nandyal and accounting procedure and guidelines will be followed as provided in the Bye-laws of AP Tiger Conservation Foundation.

Basing on the Government orders and as per the instructions of Principal Chief Conservator of Forests, A.P., Guntur, the Divisional Forest Officer, WLM Division Markapur, Atmakur, Nandyal & Giddalur have implemented the collection of Environmental Maintenance charges (EMC) for the vehicles passing through different locations in NSTR are as follows:

Table 67: EMC Check post & Eco-tourism Centres

Sl. No.	Name of the Division	Name of the EMC Check post & Eco-tourism Centres	EMC Charges commenced from
1	**2**	**3**	**4**
		EMC Check posts	
1.	**Markapur**	Ganapathi	03.06.2014
2.		Korraprolu	01.12.2016
3.		Sirigiripadu	21.03.2019
4.		Ethipothala cross road	26.02.2020
5.		Nagarjunasagar X road	26.02.2020
6.		Narajamala thanda	01.12.2020
7.	**Atmakur**	Bairluty	05.11.2016
8.		Lingalagattu	12.12.2018
9.		Sikharam	01.11.2019
	Nandyal		
10.		Pacherla	13.06.2019
	Giddalur		
11.		Diguvametta	16.08.2019
Eco-Tourism Centres			
1.	Markapur	Thummalabailu (Jungle Safari only)	20.12.2017
2.		Nekkanti Jungle Ride	18.11.2021
3.		Ethipothala Water falls (Veranjaneyapuram)	-
4.	Atmakur	Bairluty (Jungle safari with accommodation)	10.05.2017
		Velgode Tiger Safari (proposed)	-
5.	Nandyal	Pacherla (Jungle safari with accommodation)	-

The EMC amount collected / deposited in respective division accounts and later transferred to Circle TCF account. The revenue generated from Eco-tourism also deposited in the TCF account.

Initially the NSTR receives (upto 2018-19) substantial funds through NTCA and State Government, CAMPA funds and Biodiversity society of Andhra Pradesh to meet the recurring and non-recurring expenditure of the management of NSTR. Later on due to paucity of funds from other organizations, The Tiger Conservation Foundation is the source of funding almost the entire expenditure of the NSTR. The due procedure is followed for the sanction of the Tiger Conservation Fund for every financial year and sanction is accorded by the Governing body. The major components for the expenditure incurred is towards Forest & Wildlife Protection, Man- Animal conflict, Eco-tourism & Eco-development, Wildlife Research and Monitoring, Publicity & extension, Staff welfare and Office support.

The statement showing the details of revenue and expenditure for the year 2014-15 to 2022-23 is furnished below for favour of kind information (**Annexure IX**)

13.4 COORDINATION WITH LINE AGENCIES/ DEPARTMENTS

Coordination with following agencies is required for management:

1. **Revenue Department:** For rehabilitation of villages, coordination with Revenue Department is required. The Collector, being at the helm of all the affairs at district level, her co-operation is required for rehabilitation. Different Departments like Land Records, P.W.D., Electricity (AP Genco/ Transco), Irrigation Department, Z.P. Health, Education, Tribal Development etc. is required during rehabilitation.
2. **Zilla Parishad:** Co-ordination with *Zilla Parishad* / Panchayat department is very important as many village development activities are taken up by Z.P. The works like provision of bio-gas are taken by Z.P. The works of vaccination and provision for improved human health care are taken up by Z.P. Employment generation activities like sericulture; horticulture, bee-keeping, fisheries etc. are implemented by Panchayat Raj Department. Other activities like stall feeding, water harvesting structures, soil and moisture conservation works are implemented by *Panchayat Raj Department*.

3. **Police Department:** For protection of the forest and wildlife, coordination with Police Department is a must. There should be perfect co-ordination need to be maintained with the Police Department. Proposal of District Tiger Cell is under consideration which is to be monitored by Police authorities only.
4. **Animal Husbandry Department:** The coordination with Animal Husbandry Department is required for vaccination of the cattle, of inside and fringe villages. In case of death of animals in offence cases, unknown causes, sickness of animals etc. the postmortem is required to be done to ascertain the cause of death. In such cases the help of local veterinary officer is required to be taken.
5. **Forest Department/ APFDC.:** Coordination with territorial wing of Forest Department of State of Telangana and border DFO's of the Project Tiger is required for monitoring the wildlife. There is proposal for working with APFDC for fire protection in the Reserve. APFDC likely to be nominated for the rehabilitation of villages in relocation of villages.

13.4.1 Interstate coordination of NSTR & Amrabad Tiger Reserve of Telangana:

As the Nagarjunasagar Srisailam Tiger Reserve shares a very long interstate boundary along the River Krishna with Amrabad Tiger Reserve of Telangana State, cooperation between the Forest Departments of two states is crucial for effective management. It is also seen that, a large number of animals, predators and prey alike regularly move between these two Tiger Reserves. In addition, these two (2) Tiger Reserves share protection issues such as illegal fishing, grazing, poaching etc. To effectively manage the Tiger Reserves, interstate meetings of the Field Directors of the two States along with their staff should be conducted at least every three (3) months.

13.4.2 Interdepartmental coordination:

The Field Director and Deputy Directors will take up issues where interdepartmental coordination is required duly following all the Acts and Laws in vogue.

13.5 STAFF DEPLOYMENT

- The Field Director of this Tiger Reserve is of the rank of Conservator of Forests and is the overall in-charge of the 'Project Tiger Circle'. He is responsible to the Govt. of Andhra Pradesh through the Chief Wildlife Warden of the state and on the other hand to the Govt. of India with respect to the implementation of the Project Tiger scheme.

- 4 Deputy Directors *viz*., Atmakur, Markapur, Giddalur and Nandyal are holding charge of the Wildlife Divisions and one Divisional Forest Officer, Flying Squad Division, Atmakur and one Assistant Conservator of Forests (Biodiversity), Srisailam and their staff assist the Conservator of Forests and Field Director in its management of the core and buffer areas.
- There is a Research Division headed by an Assistant Conservator of Forests specialized in Wildlife Management or Environmental/Ecological specializations. Project scientists / Biologists are taken on outsourcing basis under various Research Projects of ongoing schemes.
- The administrative office of the Field director is located at Nandyal and the offices of the Deputy Directors and District Forest Officer are situated at Atmakur, Markapur, Giddalur and Nandyal.

13.5.1. Proposed Organisation Setup:

It is proposed to rename certain units of divisions and sub-divisions on par with Tiger Reserve model. Assistant Conservator of Forests, Biodiversity, Srisailam is proposed as Assistant Director, Biodiversity, Srisailam and all Sub-Divisional Forest Officers as Assistant Directors.

13.5.2. Amenities to Staff:

Presently the field staff of NSTR is posted at Head Quarters in interior forests where there are no school facilities. The families of the staff are to be kept at for away place for schooling. A school/ staff bus is also proposed for school going kids. The funds from Tiger Conservation Foundation shall be used for providing amenities to the field staff.

All the field staff upto Deputy Range Officer are supposed to stay in camps or make continuous tour even in night so staff welfare should be taken at priority basis. The proper education and health facilities are not available in most part of core area. Thus, staff is deputed to inhospitable areas. Further, duty conditions are strenuous and arduous. In such circumstances, it is duty of DDs/DFOs to ensure amenities to staff, so they can serve better in protection and management of the area. Some of the basic needs are to be fulfilled are discussed below.

a) Project Allowances to the field staff: As per NTCA guidelines the staff working in Nagarjunasagar Srisaailam Tiger Reserve are being given the project allowance. Necessary proposals have been made for next ten (10) years in the budget.

b) Housing: As per the instructions of the NTCA and reorganization of Districts and Forest Divisions the head quarter of Field Director shifted from Srisailam to Nandyal. A residence and office set up for field director has to be established at Nandyal. Budget has been proposed accordingly in budget.

c) Health checkups / Insurance: Regular health camps should be organized for health checkup of staff; some hospitals could be contracted for complete checkup and treatment of staff and their immediate family. This will ensure better health and will in turn result into better output from staff & will have great value. Possibility of health insurance for staff & field assistants living in interior areas should be explored with insurance company & take up the scheme.

d) Uniform and protective gear: Timely supply of good quality uniforms as per provisions shall be ensured every year along with other items such as caps, belts, boots, hunter shoes, winter wears, raincoats, etc.,

e) Field Equipment: Necessary camp and field equipment for the protection of staff should be provided. The other necessary equipment helpful in carrying out field work e.g. water bottles, measuring tapes, compass, pedometers, field forms and diaries, small axe, fire arms, tiger tracers, plaster of paris, binoculars, camera traps, range finders, etc. shall be provided as and when needed. Necessary budget has been proposed in budget sheet.

f) Rewards: Special rewards to staff for outstanding performance is proposed. This will be on case to case basis.

13.6. FUND RAISING STRATEGIES

Presently, the major financial resources are available through the Centrally Sponsored Scheme of Project Tiger, Forest Fire Prevention & Management, the State Government budgetary sources viz., Compensatory Afforestation Fund Management and Planning Authority (CAMPA), Biodiversity Society of Andhra Pradesh (BIOSAP), Andhra Pradesh Tiger Conservation Foundation (APTCF), Vana Vihari, 03 District Offices, etc. The Tiger Reserve is also actively seeking funds from Industries and Multinational Companies under Corporate Social Responsibility (CSR).

13.7. SCHEDULE OF OPERATIONS

The management of the Tiger Reserve will be carried out according to the schedule of operations given in the Forest Schedule of Rates (FSR). The rates and schedule of operation are decided and finalized by the Zonal FSR Committee. This committee meets every year and takes all factors such as Collector wage rate, Market rates etc., before finalizing the applicable rates and schedule of operations. The prescriptions of the approved Tiger Conservation Plan will be the framework for implementation of the various operations.

Table 68: Schedule of some Major Operations

Operations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Protection of Tiger Reserve												
Monsoon Patrolling												
Fire line Cutting & Controlled burning												
Fire Fighting												
Road Repairs												
Soil & Moisture Conservation												
Collection of Seeds and Propagation through Nursery												

13.8 ACTIVITY BUDGET

As per the prescriptions of the approved Tiger Conservation Plan, the Deputy Directors and District Forest Officer submit the Annual Plan of Operations (APO) under various schemes which are ongoing such as Project Tiger, Forest Fire Prevention & Management, Compensatory Afforestation Fund Management and Planning Authority (CAMPA), Biodiversity Society of Andhra Pradesh (BIOSAP), Andhra Pradesh Tiger Conservation Foundation (APTCF), Vana Vihari, 03 District Offices, etc. This APO is submitted to the Field Director who consolidates the budget proposals for each scheme. This APO is then submitted to the Chief Wildlife Warden who gets it approved from the competent authority as per the scheme. Once the approval of the APO is received, the Deputy Directors / District Forest Officer will take up the work.

CHAPTER 14

Monitoring and Evaluation



Periodic review of the effectiveness of management interventions will help in evaluating the success of management and identifying shortfalls for rectification. Mechanism for monitoring of various management interventions, population of tiger, co-predator, prey species and habitat, research and training etc. are detailed in respective chapters.

In the current scenario of rapid global as well as local changes brought about by climate, changing policies and priorities of management, it is proposed to have a periodic review of this Tiger Conservation Plan (TCP) after five years. A general procedure for monitoring and evaluation of management interventions is discussed in this chapter. The criteria and process for evaluation are as follows:

14.1 CRITERIA

The criteria of monitoring and evaluation are of two types:

1) Physical
2) Qualitative

The physical criteria consist of completion of physical activity of any work e.g. Creation of a meadow or a water source is a physical criterion. However, the durability of the meadow or the retention of water in water source and use of the meadow by herbivore or the use of water source by wild animals is the qualitative

criteria. The physical criteria are thus a mechanical activity while the qualitative criteria need a close observation for over a time period. So the physical evaluation of all works carried out in a financial year should be completed in May/June of next year. The qualitative evaluation should be started from next year of completion of physical evaluation and should be carried out continuously for two years. This will be the responsibility of Field Director to complete physical and qualitative evaluation of each and every work in the given time frame. In addition to the physical and qualitative evaluation the parameters and criteria for evaluation of management interventions of core and their success indicators are given below.

Table 69: Parameters and criteria for monitoring and evaluation

S.No.	Parameter	Evaluation Criteria	Success indicators
1.	Effective protection	Daily patrolling schedule Combined River patrolling Highway patrolling Anti-poaching camps Infrastructure developed Base camps Strike Forces Wildlife Protection & Rescue Parties Communication equipment Fire arms Surprise checks Interstate meetings	Reduction in poaching Reduction in illegal fishing Reduced cases of illegal entry. No. of meetings/interactions with adjacent State/Divisions Days/staff spent on patrolling Kilometers of vehicle patrolling recorded in M-STrIPES Kilometers of foot patrolling recorded in M-STrIPES Reports generated
2.	Habitat management interventions	Biotic interference Regeneration status Invasion of woody species in grassland Invasion of lantana, prosopis and other weeds Water sources and their distribution	Reduction in number of cattle Reduction in NTFP collection (annual quantification) Reduction in incidents/extent of fire Reduction in invasion of weed species (Number, density) Increased regeneration of natural species Increased habitat utilization by wildlife Availability of water during peak summer in a specific grid and monitoring to be done grid wise (Grid may vary 2 km to 4 Km.s)

3.	Animal populations	Tiger and co-predators Prey population Cattle population inside Tiger Reserve	Increased number of tigers/ co-predators / cubs Increased frequency of indirect evidences Increased prey density Decrease in cattle population
4.	Fire protection	Fire occurrences and control	Monthly during fire season i.e., from March to May and Annual monitoring beat wise/ Compartment wise. No of incidences and extent of area burnt.
5.	Human-wildlife conflicts	No. of conflict incidences Effectives of mitigation measures Road kills and monitoring the wildlife on the Roads Crop damages	Reduced incidences of Cattle lifting Crop damage Human death / Injury No of kills on the roads, road wise Sightings on the Roads
6.	Human Resource Development	Staff amenities No. of staff trained	Increased staff satisfaction Efficiency of staff increased.
7.	Financial support	Utilization of funds received	Percentage of funds utilized
8.	Stakeholder satisfaction	Adverse comments on the management / staff	Reduced negative comments / Complaints / Media reports
9.	Livelihood issues	Measures taken to address livelihood issues	No. of man days generated Alternate income generated No. of people employed directly by forest department
10.	Research and monitoring	No. of studies	No. of reports / publications
11.	Conservation Awareness	Increased public support Increased public involvement	No. of nature camps No. of awareness campaigns No. of trainings conducted
12.	Wildlife Health Management	Immunization of fringe area cattle Monitoring wildlife health	Reduced wildlife mortality due to diseases Increase in prey density Reduction in Road kills

14.2 PROCESS

Schedule of evaluation of criteria is given in the above table. The Field Director will develop a format for objective evaluation of management interventions based on the above parameters and criteria. The parameters requiring professional inputs such as habitat management interventions, assessment of changes in animal populations, research and monitoring will be evaluated by the Field Director. The parameters for wildlife health monitoring will be reviewed by the Veterinarians in the Wildlife Dispensary. Reports of all these evaluations will be submitted to Deputy Directors.

Table 70: Schedule of evaluation

Sl. No.	Parameter	Criteria	Schedule
1.	Effective protection	Daily patrolling schedule Combined River patrolling Highway patrolling Anti-poaching camps Infrastructure developed Base camps Strike Forces Wildlife Protection & Rescue Parties Communication equipment Fire arms Surprise checks Interstate meetings	**Monthly** (Interstate meetings to be conducted once every three (3) months.)
2.	Habitat management interventions	Biotic interference Regeneration status Invasion of woody species in grassland Invasion of lantana, prosopis and other weeds Water sources and their distribution	Annual
3.	Animal populations	Tiger and co-predators Prey population Cattle population inside Tiger Reserve	Annual
4.	Fire protection	Fire occurrences and control	Monthly during fire season i.e., from March to May and annual

5.	Human-wildlife conflicts	No. of conflict incidences Effectives of mitigation Measures Road kills and monitoring the wildlife on the Roads Crop damages	Annual
6.	Human Resource Development	Staff amenities No. of staff trained	Annual
7.	Financial support	Utilization of funds received	Annual
8.	Stakeholder satisfaction	Adverse comments on the management / staff	Annual
9.	Livelihood issues	Measures taken to address livelihood issues	Annual
10.	Research and monitoring	No. of studies	Annual
11.	Conservation Awareness	Increased public support Increased public involvement	Annual
12.	Wildlife Health Management	Immunization of fringe area cattle Monitoring wildlife health	Annual

Evaluation reports will be submitted by Field Director to the Chief Wildlife Warden and placed before the Tiger Steering Committee.

14.3 DIVISIONAL NOTE BOOK: -

Some important events will be recorded in Divisional Notebook by Deputy Directors (Core). This will include arrival of winter water fowl at various wetlands, water availability in pinch period, status of health of wild animal, fire damages, poaching of wild animals and any other important events.

Annexures

ANNEXURE-I
NOTIFICATION

NOTIFICATION

In exercise of the powers conferred by Section 38 (V) of the Wildlife (Protection) Act, 1972 (Central Act No.53 of 1972) and amendment Act, 2006 (No.39 of 2006) the Government of Andhra Pradesh hereby declares an area of 290835.44 Ha. (2908.35 Sq.Kms.) as Core (comprising of Rajiv Gandhi Wildlife Sanctuary and Gundla Brahmeswaram Wildlife Sanctuary) for the purpose of Tiger Conservation, which shall be called as Core / Critical Tiger Habitat of "Nagarjunasagar Srisailam Tiger Reserve". The area identified, constitutes an area of notified Reserve Forest Blocks in Project Tiger, Atmakur and Project Tiger, Nandyal of Nandyal District and Project Tiger, Markapur of Prakasam and Palnadu Districts and Project Tiger, Giddalur of Prakasam District.

THE SCHEDULE

Names of the Districts	: 1. Prakasam
	: 2. Nandyal
	: 3. Palnadu
Names of the Forest Divisions	: 1. Project Tiger, Markapur
	: 2. Project Tiger, Atmakur
	: 3. Project Tiger, Giddalur
	: 4. Project Tiger, Nandyal
Names of the Mandals	: 1. Macherla
	: 2. Veldurthy
	: 3. Y.Palem
	: 4. Dornala
	: 5. Pedda Araveedu
	: 6. Rentachintala
	: 7. Atmakur
	: 8. Srisailam
	: 9. Kothapalli

: 10. Pamulapadu
: 11. Velgodu
: 12. Bandi Atmakur
: 13. Mahanandi
: 14. Sirivella
: 15. Giddalur
: 16. Racherla
: 17. Ardhaveedu

Names of the Forest Ranges : 1. V.P.South
: 2. Gangivaripalli
: 3. Yerragondapalem
: 4. Dornala
: 5. Korraprolu
: 6. Nekkanti
: 7. Nagaluty
: 8. Atmakur
: 9. Srisailam
: 10. Velgodu
: 11. Bairluty
: 12. Gundla Brahmeswaram
: 13. Bandi Atmakur
: 14. Nandyal
: 15. Chalama
: 16. Thurimella
: 17. Gundlakamma

Name of the Core area of the Nagarjunasagar Srisailam Tiger Reserve : NSTR Core Area

Area of NSTR core area : 290835.44 Ha **(or)** 2908.35 Sq.kms

THE SCHEDULE

Sl No	Name of the District	Name of the Forest Division	Name of the Forest Ranges	Name of the Sancutary	Core Area in	
					Ha.	Sq.Kms
1	Prakasam	PT, Markapur	Dornal	Gundla Brahmeswaram (GBM)	6796.74	67.9674
2		PT, Giddalur	Gundlakamma Turimella		39022.50	390.2250
3	Nandyal (erstwhile Kurnool District)	PT, Atmakur	Velugode Bairluty		31389.22	313.8922
			Velugode		331.00	3.310
4		PT, Nandyal	GBM		41829.00	418.290
				GBM total	**119368.46**	**1193.6846 (or) 1193.68**
1	Palnadu	PT, Markapur	V.P South	Rajiv Gandhi Wildlife Sanctuary (RGWL)	22932.28	229.3228
	Prakasam		Y.Palem G.V Palli Korraprolu Dornal Nekkanti		101868.24	1018.6824
2	Nandyal (erstwhile Kurnool District)	PT, Atmakur	Nagaluty Srisailam Atmakur		46666.46	466.6646
				RGWL total	**171466.98**	**1714.6698 (or) 1714.67**
				Grand Total	**290835.44**	**2908.3544 (or) 2908.35**

Boundaries of Core area of Nagajunasagar Srisailam Tiger Reserve

The boundaries of Core of Nagarjunasagar Srisailam Tiger Reserve area as delineated in the map kept in the office of the Principal Chief Conservator of Forests, Andhra Pradesh, Mangalagiri are as follows:

North:

Station A to C:- The core boundary of Nagarjunasagar Srisailam Tiger Reserve from station **"A"** denoted on the map which is North west corner of Compartment no. 839 and runs along the central line (Mid line) of river Krishna which is inter State boundary between Andhra Pradesh & Telangana i.e., the boundary between Rajiv Gandhi Wildlife Sanctuary of Nagarjunasagar Srisailam Tiger Reserve, Andhra Pradesh on the southern side and Amrabad Tiger Reserve of Telangana State on the northern side of river Krishna.

Then the boundary moves along mid of River Krishna from point 'A' in zig-zag manner in Srisailam, Nekkanti, G.V Palli and V.P South Ranges and touches the Nagarjunasagar reservoir and further proceeds in north eastern direction along the mid of river Krishna till it reaches point **'B'** i.e., northern part of compartment No.83 of Pasuvemula RF of V.P South Range.

Then the boundary moves towards eastern direction along northern boundaries of compartment nos.85,86,87&88 of V.P South Range i.e., point **"C"**.

East :

Station C to D: Then the core boundary of NSTR runs towards southern direction along the southern boundaries of Compartment nos. 87, 86 and eastern boundaries of Compartment nos. 83, 77, 75, 70 & 69 of Kandlakunta RF; and Compartment nos. 68, 67 and 66 of Gangalakunta RF; Compartment nos. 369 &149 of Markapur RF; Compartment nos. 146 &147 of ENB-IX RF; Compartment nos. 140,122,123 &124 of Markapur RF; and Compartment no.125 of ENB-VIII RF and reaches the point **"D"** at south east corner of compartment no. 126 of Y.Palem Range.

Station D to E: Then the core boundary runs towards western direction along the southern boundaries of Compartment nos. 127, 128, 118, 92 & 381 of Markapur RF; Compartment nos. 380, 69, 379 & 68 of ENB-VII RF;

Compartment nos. 83, 84, 66,64, 18, 17 & 24 of Markapur RF and reaches point **"E"** i.e., south west corner of Compartment no.20 of Markapur RF.

Station E to F: Then the core boundary of NSTR touches the Gundla Brahmeswaram Wildlife Sanctuary from station **'E'** and runs along eastern boundary along the small stream (including stream) towards its origin Peddamanti Konda (757) and thence follows a cut line joining the Konduru Vagu and runs along the said Vagu, it will cross the Kurupenta Chinna Mantanala Rest House. Thence the Eastern boundary runs along Chinnamantanala - Maddipenta road in South–Westerly direction and southern direction till it joining the cart track leading from Komativanibhavi. Thence along the said cart track up to Western boundary of Eastern Nallamalai Reserve Forest along the common boundary of Cumbum Reserve Forest in Southerly and Easterly direction upto South-East corner of Eastern Nallamalai-III Reserve Forest. Thence the boundary line passes along a cut line touching the peaks 843, 795, 454 and 670 Gunikonda and then follows the line joining Motuvagu and the line runs along Motuvagu (including it) up to the point where Motuvagu touches the Western boundary of Eastern Nallamalai Reserve Forest. Thence the boundary line runs in Southerly direction along the common boundary of Eastern Nallamalai-1 Reserve Forest and Cumbum Reserve Forest upto Giddalur – Nandyal road (151 Km. stone) as noted on the map. Then the core boundary runs along South East corner of Cumbum Reserve Forest and South –West corner of Eastern Nallamalai Reserve Forest, the Southern boundary runs in Westerly direction along the Giddalur-Nandyal road (Nandikanuma road which is also the Southern boundary of Cumbum Reserved Forest till they said road meets the Railway Line) thence the Southern boundary runs along the said Railway Line (include it) upto a point where the Eastern boundary of Nandyal Extension-1 Reserve Forest crosses Railway line, and thence the line runs along the common boundary of Nandyal Reserve Forest and Nandyal Extension -1 Reserve Forest upto 420 K.M. (Railway line) to meet station-**"F"** noted in the map.

South:

Station F to G: Then the core boundary of NSTR from the point **"F"** which met the South-East corner of Compartment no.775 of Ambavaram Reserve

Forest and South-East corner of Eastern Nallamalai Reserve Forest and the boundary runs in western direction along southern boundaries of Compartment no.767 and eastern boundary of Compartment no.693 and runs western direction along the Giddalur-Nandyal road (Nandikanama road which is also the southern boundary of Cumbum Reserve Forest till the said road meets the Railway line) thence the southern boundary runs along the said railway line (excluding it) upto a point where the Eastern boundary of Nandyal Extension-I Reserve Forest crosses Railway line, and thence the line runs along common boundary of Nandyal Reserve Forest and Nandyal Extension – I Reserve Forest upto 420th Km (Railway line) to meet Station **"G"** noted on the map.

West

Station G to A: Then the core boundary of NSTR from Station **"G"** runs along the Western boundary of Nandyal Reserve Forest which is also a fire line till the line meets the Velgode GBM Forest Road and thence the line runs along the Forest road till it meets the bund of Velgode (Telugu Ganga Project) balancing Reservoir in Southern side and Western side. Thence the boundary follows the full Reservoir level line (+264.70) upto the point where the Pasurutlavagu touches the full Reservoir level line and thence along the said vagu (including the vagu) to the point where it touches the 220 K.V. line and then the boundary runs in North East direction upto Kurnool-Guntur road as noted in the Map. Then the core boundary of NSTR runs towards northerly direction along the boundaries of Compartment nos. 757, 755, 754, 753, 752, 751, 861, 860, 859, 858, 857, 856, 836, 837, 840, 838 of Nandikotkur RF and reaches starting point **"A"**.

The adjoining village communities of Core area of Nagarjunasagar Srisailam Tiger Reserve are entitled to the restricted rights and concessions as admitted at the settlement of Forest Blocks until relocation without causing any impact on the adjoining Forest and Wildlife of Nagarjunasagar Srisailam Tiger Reserve.

All the enclosures within the Reserve Forests and villages and private lands covered in the above specified limits shall stand included in the Core area of Nagarjunasagar Srisailam Tiger Reserve for the purpose of the notification.

NOTIFICATION

In exercise of the powers conferred by Section 38 (V) of the Wildlife (Protection) Act, 1972 (Central Act No.53 of 1972) and amendment Act, 2006 (No.39 of 2006) the Government of Andhra Pradesh hereby declares an area of 253446.68 Ha (2534.46 Sq.Kms) as Buffer of Nagarjunasagar Srisailam Tiger Reserve. The area identified, constitutes an area of notified Reserve Forest Blocks in Project Tiger, Atmakur, Project Tiger, Nandyal of Nandyal District and Project Tiger, Markapur of Prakasam and Palnadu District and Project Tiger, Giddalur of Prakasam District. The details are as per the area statement attached and shown in the map kept in the Office of the Principal Chief Conservator of Forests, Andhra Pradesh, Aranya Bhavan, Mangalagiri.

THE SCHEDULE

Names of the Districts	: 1. Prakasam
	: 2. Nandyal
	: 2. Palnadu
Names of the Forest Divisions	: 1. Project Tiger, Markapur
	: 2. Project Tiger, Atmakur
	: 3. Project Tiger, Nandyal
	: 4. Project Tiger, Giddalur
Names of the Mandals	: 1. Macherla
	: 2. Veldurthy
	: 3. Y.Palem
	: 4. Dornala
	: 5. Pedda Araveedu
	: 6. Rentachintala
	: 7. Atmakur
	: 8. Srisailam
	: 9. Kothapalli
	: 10. Pamulapadu
	: 11. Velgodu
	: 12. Bandi Atmakur
	: 13. Mahanandi

	: 14. Sirivella
	: 15. Giddalur
	: 16. Racherla
	: 17. Ardhaveedu
Names of the Forest Ranges	: 1. V.P.South
	: 2. Yerragondapalem
	: 3. Dornala
	: 4. Markapur
	: 5. Korraprolu
	: 6. Nagaluty
	: 7. Bairluty
	: 8. Atmakur
	: 9. Velgodu
	: 10. Rudravaram
	: 11. Bandi Atmakur
	: 12. Nandyal
	: 13. Chalama
	: 14. Giddalur
	: 15. Thurimella
	: 16. Gundlakamma
Name of the Buffer Area of Nagarjunasagar Srisailam Tiger Reserve	: Buffer of “Nagarjunasagar Srisailam Tiger Reserve” (I to XXV)
Area of the buffer of Nagarjunasagar Srisailam Tiger Reserve	: **253446.68 Ha. (or) 2534.46 Sq.Kms.**

THE SCHEDULE

Sl No	Name of the buffer area for Nagarjunasagar Srisailam Tiger Reserve	District	Division	Range	Buffer Area	
					In Ha	In Sq.Kms
1	Buffer area for Nagarjunasagar Srisailam Tiger Reserve -I	Nandyal	Project Tiger Atmakur	Bairluty	6245.06	62.45
				Velgode	10083.6	100.84
				Sub-Total	**16328.66**	**163.29**
2	Buffer area for Nagarjunasagar Srisailam Tiger Reserve - II	Nandyal	Project Tiger Atmakur	Atmakur	73.2	0.73
				Nagaluty	2142.42	21.42
				Sub-Total	**2215.62**	**22.15**
3	Buffer area for Nagarjunasagar Srisailam Tiger Reserve - III	Nandyal	Project Tiger Atmakur	Atmakur	27941.15	279.41
				Division Total	**46485.43**	**464.85**
4	Buffer area for Nagarjunasagar Srisailam Tiger Reserve - IV	Palnadu	Project Tiger Markapur	V.P South	2.02	0.02
5	Buffer area for Nagarjunasagar Srisailam Tiger Reserve - V			V.P South	614.14	6.14
6	Buffer area for Nagarjunasagar Srisailam Tiger Reserve - VI			V.P South	122.13	1.22
7	Buffer area for Nagarjunasagar Srisailam Tiger Reserve - VII	Palnadu	Project Tiger Markapur	V.P South	2989.68	29.9
		Prakasam		Y.Palem	36607.03	366.07
				Sub-Total	**40335**	**403.35**
8	Buffer area for Nagarjunasagar Srisailam Tiger Reserve - VIII	Prakasam	Project Tiger Markapur	Y.Palem	3664.13	36.64
9	Buffer area for Nagarjunasagar Srisailam Tiger Reserve - IX			Y.Palem	4848.8	48.49
10	Buffer area for Nagarjunasagar Srisailam Tiger Reserve - X			Dornal	1975.52	19.76
11	Buffer area for Nagarjunasagar Srisailam Tiger Reserve -XI	Prakasam	Project Tiger Markapur	Korraprolu	11727.48	117.27
				Dornal	6887.17	68.87
				Markapur	28598.79	285.99
				Sub-Total	**57701.89**	**577.02**

12	Buffer area for Nagarjunasagar Srisailam Tiger Reserve -XII	Prakasam	Project Tiger Markapur	Markapur	4682.96	46.83
13	Buffer area for Nagarjunasagar Srisailam Tiger Reserve -XIII	Prakasam	Project Tiger Markapur	Markapur	1377.17	13.77
14	Buffer area for Nagarjunasagar Srisailam Tiger Reserve -XIV	Prakasam	Project Tiger Markapur	Korraprolu	283.21	2.83
15	Buffer area for Nagarjunasagar Srisailam Tiger Reserve -XV	Prakasam	Project Tiger Markapur	Dornal	1416.44	14.16
16	Buffer area for Nagarjunasagar Srisailam Tiger Reserve -XVI	Prakasam	Project Tiger Markapur	Markapur	530.10	5.3
				Division Total	**106326.77**	**1063.26**
17	Buffer area for Nagarjunasagar Srisailam Tiger Reserve -XVII	Prakasam	Project Tiger Giddalur	Turimella	10808.32	108.08
18	Buffer area for Nagarjunasagar Srisailam Tiger Reserve -XVIII	Prakasam	Project Tiger Giddalur	Turimella	9799	97.99
19	Buffer area for Nagarjunasagar Srisailam Tiger Reserve -XIX	Prakasam	Project Tiger Giddalur	Gundlakamma	6854.78	68.55
20	Buffer area for Nagarjunasagar Srisailam Tiger Reserve -XX	Prakasam	Project Tiger Giddalur	Giddalur	23787.86	237.88
				Gundlakamma	3905.49	39.05
				Sub-Total	**55155.45**	**551.55**
21	Buffer area for Nagarjunasagar Srisailam Tiger Reserve -XXI	Prakasam	Project Tiger Giddalur	Turimella	1494.69	14.95
22	Buffer area for Nagarjunasagar Srisailam Tiger Reserve -XXII	Prakasam	Project Tiger Giddalur	Turimella	3758.006	37.58
23	Buffer area for Nagarjunasagar Srisailam Tiger Reserve -XXIII	Prakasam	Project Tiger Giddalur	Giddalur	1025	10.25
				Division Total	**61433.146**	**614.33**

24	Buffer area for Nagarjunasagar Srisailam Tiger Reserve -XXIV	Nandyal	Project Tiger, Nandyal	Chelama	19378.23	193.78
				Nandyal	459.33	4.59
				Rudravaram	13897.37	138.97
				Sub-Total	**33734.93**	**337.34**
25	Buffer area for Nagarjunasagar Srisailam Tiger Reserve - XXV	Nandyal	Project Tiger, Nandyal	Bandi Atmakur	4767.26	47.67
				Nandyal	699.15	6.99
				Sub-Total	**5466.41**	**54.66**
				Division Total	**39201.34**	**392.00**
				Grand Total	**253446.686**	**2534.440**

Boundaries of Buffer area to Nagarjunasagar Srisailam Tiger Reserve

The boundaries of Buffer area for Nagarjunasagar Srisailam Tiger Reserve area as delinated int he map kept in the Office of the Principal Chief Conservator of Forests, Andhra Pradesh, Mangalagiri are as follows:

Buffer area for Nagarjunasagar Srisailam Tiger Reserve - I (Project Tiger, Atmakur).

North (A-B-C):- The Boundary of Buffer of NSTR starts from point **'A'** as delineated on map (North West corner of Compartment No. 652 in Velgode R.F of Velgode Range) and runs towards south-east direction along the north – east boundary of compartment No. 652 of Velgode Range, Project Tiger, Atmakur. Thence the boundary line runs towards north-east direction along with Northern boundary of Compartment Nos. 653, 654, and 656 in Velgode R.F of Velgode Range. Thence the boundary line runs North – East direction along with North – West boundary of Compartment Nos. 697, 698, 700 and boundary line runes Northern boundary of Compartment No. 701 and meets North corner of Compartment No. 702 in Velgode R.F of Bairluty Range. Thence the boundary line runes North – East direction along with North – West boundary of Compartment Nos. 703 & 747 in Nandyal R.F of Bairluty Range and meets point **'B'** as noted on the map (North-west corner of Compartment No. 747). Then the boundary line runs towards eastern direction along with Northern boundary of Compartment No. 747 upto Eastern corner of Compartment No. 747. Then the boundary line runs in a small

distance towards Southern direction along with Eastern boundary of Compartment No. 747. Thence the boundary line runs South – East direction along with Northern boundary of Compartment Nos. 745, 746 in Nandyal R.F of Bairluty Range and meets point **'C'** as noted on the map (North – East corner of Compartment No. 745).

East (C- D -E): Then the boundary line runs towards south – west direction upto point **'D'** denoted on the map (South west corner of Compartment 713 in Nandyal R.F of Bairluty Range) along with Eastern boundary of Compartment Nos. 745, 746,705,709,714,711,713 in Nandyal R.F of Bairluty Range and also Gundla Bramheswaram Wildlife Sanctuary boundary. Thence, the boundary line runs towards western direction along with Gundla Bramheswaram Wildlife Sanctuary boundary and also with the Southern boundary of Compartment Nos. 713, 712 in Nandyal R.F. of Bairluty Range and Southern boundary of Compartment No. 695 in Velugode R.F. of Bairluty Range. Then the boundary line runs towards South – West direction along with Gundla Bramheswaram Wildlife Sanctuary boundary and also South – West boundary of Compartment No. 657 in Velugode R.F. of Velugodu Range. Then the boundary line runs South – East direction along with Gundla Bramheswaram Wildlife Sanctuary boundary upto South – East corner of Compartment No. 659. Then the boundary runs towards south easterly direction along the western boundary of Compartment Nos. 645, 644, 643, 642, 641 & eastern corner of Compartment No.640 i.e., station **'E'**.

South (E to F):- Then the boundary line runs towards westerly direction along the southern boundary of Compartment No.640 and reaches point **"F".**

West (F-G-H-A):- The boundary runs in northerly direction in zig-zag manner along the western boundaries of Compartment Nos. 640, 641, 642, 643, 644 and touches south west corner of Compartment No. 645 in Velgode RF of Velgode Range and meets point 'G' as delineated in the map. Thence the boundary line runs towards North – West direction in a small distance along the southern boundary of Compartment Nos. 646,647,648,649 in

Velgode R.F of Velgode Range and meets point **'H'** as denoted on the map (south – west corner of Compartment No. 649 in Velgode R.F of Velgode Range). Then the boundary line runs towards North West direction in zig-zag manner along with western boundary of Compartment Nos. 649,650,651,653 & 652 in Velgode R.F of Velgode Range and meets starting point **'A'** as noted on the map.

Buffer area for Nagarjunasagar Srisailam Tiger Reserve – II (Project Tiger, Atmakur)

The areas of the following Compartments, which are adjoining to the Rajiv Gandhi Wildlife Sanctuary are included in buffer areas outside the sanctuary.

Compartment Nos.748, 749,750,832,833& 834 in Guvvalakuntla 'C' R.F of Nagaluty Range and Compartment No. 835 in Guvvalakuntla 'C' R.F. of Atmakur Range of Project Tiger, Atmakur.

Buffer area for Nagarjunasagar Srisailam Tiger Reserve – III (Project Tiger, Atmakur)

West (I to J): The boundary line runs towards north easterly direction along the eastern boundaries of Compartment Nos. 775, 776, 777, 778, 780 and 779 and reaches point **'J'**.

North (J to K): Then the boundary line runs towards easterly direction along the northern boundaries of Compartment Nos. 779, 150, 787, 788, 794, 795, 801, 802, 806, 808 of Nandikotkur RF of Atmakur Range. Then boundary line runs towards South – East direction along Krishna river and also North – East boundary of Compartment Nos. 809, 810 & 811 in Nandikotkur R.F of Atmakur Range and meets point **'K'** as noted on the map (South – East corner of Compartment No. 811 in Nandikotkur R.F of Atmakur Range).

East (K to L) :- Then the boundary runs from point **'K'** towards South - West direction along with Rajiv Gandhi Wildlife Sanctuary boundary and also Southern boundary of Compartment No. 811 and meets South – East corner of Compartment No. 810. Then the boundary line runs in South – West direction along with the Rajiv Gandhi Wildlife Sanctuary boundary and also

with Southern boundary of Compartment No. 810 in Nandikotkur R.F. of Atmakur Range. Then the boundary line runs in Southern direction along with Rajiv Gandhi Wildlife Sanctuary boundary and also Eastern boundary of Compartment Nos. 812, 813, 815, 816 in Nandikotkur R.F. of Atmakur Range and meets point **'L'** as denoted on the map (south – East corner of Compartment No. 816 in Nandikotkur R.F of Atmakur Range).

South (L to I):- Then the boundary line runs towards North – West direction in Zig–Zag manner along with southern boundary of Compartment No. 816 (in a small distance) in Nandikotkur R.F of Atmakur Range and Compartment No. 821 in Guvvalakuntla 'D' R.F. and, Compartment Nos. 822, 823, 824 in Guvvalakuntla 'B' R.F. of Atmakur Range and runs towards westerly direction along the southern boundaries of Compartment Nos. 825,826,827,828, 784, 783, 782, 776 and 775 and reaches point **'I'**.

Buffer area for Nagarjunasagar Srisailam Tiger Reserve – IV (Project Tiger, Markapur):- Compensatory Afforestation area falls in V.P.South Range as noted on the map.

Buffer area for Nagarjunasagar Srisailam Tiger Reserve – V (Project Tiger, Markapur):- Compensatory Afforestation area of Compt. No.84 falls in V.P.South Range as noted on the map.

Buffer area for Nagarjunasagar Srisailam Tiger Reserve – VI (Project Tiger, Markapur):- Compensatory Afforestation area of Compt. No.93 falls in V.P.South Range as noted on the map.

Buffer area for Nagarjunasagar Srisailam Tiger Reserve – VII (Project Tiger, Markapur)

North (A-B-C-D) :- The boundary of Buffer to NSTR starts from point **'A'** as noted on the map (North-west corner of Compartment No. 64 in Gangulagunta R.F of V.P South Range) and runs towards North – East direction along with North – West boundary of Compartment No. 64 upto North corner of Compartment No. 64 in Gangulagunta R.F. of V.P. South Range. Then boundary line runs towards South – East direction in a small distance and follow the Southern boundary of Compartment Nos. 64 and 63 in

Gangulagunta R.F of V.P. South Range. Then boundary line runs towards North – East direction upto North – West corner of Compartment No. 63. Then the boundary line runs South – East direction in a small distance and the boundary line runs towards North – East direction and meets point **'B'** as noted on the map (North – East corner of Compartment No. 63). Thence, the boundary line runs towards south-west direction in Zig – Zag manner along with Eastern boundary of Compartment No. 63 in Gangulagunta R.F of V.P South Range and meets point **'C'** as noted on the map (South-east corner of Compartment No. 63). The boundary of Buffer of NSTR starts from **'C'** as noted on the map (North-west corner of Compartment No. 200 in Markapur R.F of Y.Palem Range), and runs towards North-east direction along with Northern boundary of Compartment Nos. 201, 202, 203, 215, 216, 233, 232, 234, 235 & 237 in Markapur R.F of Y.Palem Range and meets point **'D'** as noted on the map (North-east corner of Compartment No 237).

East (D to E) :- Thence, the boundary line runs from point **'D'** towards East – South direction along with Zig – Zag manner and also with South west direction in Zig – Zag manner of Compartment Nos. 238, 239 and also with East – south direction in Zig – Zag manner of Compartment Nos. 240, 226, 222, 390 and 206 in Markapur R.F of Y.Palem Range and meets point **'E'** as noted on the map (South corner of Compartment No. 206).

South (E-F-G-H) :- Thence, the boundary line runs towards Southern direction in Zig – Zag manner along with Southern boundary of Compartment Nos. 387, 207, 388, 208, 386, 187 & 188 in Markapur R.F and ENB XII R.F of Y.Palem Range and meets point **'F'** as noted on the map (South corner of Compartment No. 188 of ENB XII R.F of Y.Palem Range). Then the boundary line runs towards Southern direction along with Eastern boundary of Compartment Nos. 385, 384, 181, 182 upto South – East corner. Then the boundary line runs towards Western direction along with Southern boundary of Compartment No. 182 and meets North – East corner of Compartment No. 174. Then the boundary line runs towards Southern direction along with Eastern boundary of Compartment No. 174 upto South – West corner of

Compartment No. 174 in Markapur R.F. of Y.Palem Range. Then boundary line runs towards Western direction along with Southern boundary of Compartment No. 174 and also the boundary runs in a small distance along with Southern boundary of Compartment No. 169. Then boundary line runs towards Southern direction in Zig – Zag manner upto South – East corner of Compartment No. 169. Then boundary line runs towards South – East direction along with North – East boundary of Compartment Nos. 168, 167 and 175 in Markapur R.F of Y.Palem Range. Then boundary line runs towards South – West direction along with Eastern boundary of Compartment No. 175 in Markapur R.F. of Y.Palem Range and meets point **'G'** as noted on the map (South-East corner of compartment No. 175 in Markapur R.F of Y.Palem Range). Thence, the boundary line runs towards Western direction in Zig – Zag manner along with Southern boundary of Compartment Nos. 175, 166, 167 in Markapur R.F of Y.Palem Range and Compartment Nos. 154, 155, 148, in ENB X R.F of Y.Palem Range and meets point **'H'** as noted on the map (South-west corner of Compartment No. 148 and joins the boundary of Rajiv Gandhi Wildlife Sanctuary i.e., core of Nagarjunasagar Srisailam Tiger Reserve.

West (H-I-A) :- Thence the boundary line runs towards North - West direction in zig-zag manner all along the Rajiv Gandhi Wildlife Sanctuary boundary i.e., core of NSTR, and also with North – West boundary of Compartment No. 148 upto North – West corner of Compartment No. 148 in ENB X R.F of Y.Palem Range. Then boundary line runs towards North – East direction along with North – West boundary of Compartment No. 148 upto North – West corner of Compartment No. 155 in ENB X R.F. of Y.Palem Range. Then boundary line runs towards North – West direction in Zig Zag manner along with Western boundary of Compartment No. 156 & Southern boundary of Compartment No. 150 upto South – West corner of Compartment No. 150 in Markapur R.F. of Y.Palem Range. Then the boundary line runs towards Northern direction along with boundary of Rajiv Gandhi Wildlife Sanctuary boundary and also Western boundary of Compartment No. 150 & 151 in Markapur R.F of Y.Palem Range and meets starting point **'I'** as noted on the map (South-West

corner of Compartment No. 65). Thence, the boundary line runs from point **'I'** towards Northern direction along with Rajiv Gandhi Wildlife Sanctuary boundary in Zig – Zag manner and also with western boundary of Compartment Nos. 65 & 64 in Gangulagunta R.F of V.P South Range and meets starting point **'A'** as noted on the map (North-west corner of Compartment No. 64).

Buffer area for Nagarjunasagar Srisailam Tiger Reserve – VIII (Project Tiger, Markapur)

North (J to K):- The boundary of buffer starts from point **'J'** as noted on the map (North – West corner of Compartment No. 158) and runs towards North – East direction along with boundary of Compartment Nos. 158, 159, 160, 161 in Y.Palem R.F of Y.Palem Range and meets point **'K'** as noted on the map (North-west corner of Compartment No. 161).

East (K to L):- Thence the boundary line runs towards South-East direction in zig-zag manner, along with eastern boundary of Compartment No. 161 upto South – East corner of Compartment No. 161. Then the boundary line runs towards South – East direction along with Northern boundary of Compartment No. 162 upto North – East corner of Compartment No. 162 in Y.Palem R.F of Y.Palem Range. Then the boundary line runs Southern direction along with Eastern boundary of Compartment No. 162 upto North – West corner of Compartment No. 163 in Y.Palem R.F. of Y.Palem Range. Then the boundary line runs North – East direction along with northern boundary of Compartment No. 163 upto North – East corner of Compartment No. 163 in Y.Palem R.F. of Y.Palem Range. Then the boundary line runs South – East directions along with the Eastern boundary of Compartment No. 163 upto South – East corner Compartment No. 163 in Y.Palem R.F. of Y.Palem Range and meets point **'L'** as noted on the map (South – East corner of Compartment No. 163).

South (L to M) :- Then the boundary line starts from station **'L'** and runs towards South-West direction along with Southern boundary of Compartment Nos. 163, 164, 165 upto middle of the Southern boundary of Compartment

No. 165 in Y.Palem R.F. of Y.Palem Range. Then the boundary line runs towards North – West direction upto South – West corner of Compartment No. 165. Then the boundary line runs towards North – West direction along with Southern boundary of Compartment Nos. 159 & 158 in Y.Palem R.F of Y.Palem Range and meets point **'M'** as noted on the map (South-West corner of Compartment No. 158).

West (M to J) :- Then the boundary line runs from point **'M'** to starting point **'J'** as noted on the map along with Western boundary of Compartment No. 158 in Y.Palem R.F of Y.Palem Range (North – West corner of Compartment No. 158).

Buffer area for Nagarjunasagar Srisailam Tiger Reserve – IX (Project Tiger, Markapur)

North (N to O):- The boundary line starts from point **'N'** as noted on the map (North – West corner of Compartment No. 189) and runs towards North – East direction along with boundary of Compartment Nos. 190 and 191 in Y.Palem R.F of Y.Palem Range and meets point **'O'** as noted on the map (North-west corner of Compartment No. 191).

East (O to P):- Thence the boundary line runs towards South-East direction in zig-zag manner, along with eastern boundary of Compartment Nos. 191 upto South – East corner of Compartment No. 193. Then the boundary line runs towards Southern direction along with eastern boundary of Compartment Nos. 193, 194, 195, 178 and upto southern corner of Compartment No.179 and meets point **'P'**.

South (P to Q) :- Then the boundary line starts from station **'P'** and runs towards South-West direction along with Southern boundary of Compartment Nos. 179 and 176in Y.Palem R.F. of Y.Palem Range and meets point **'Q'**.

West (Q to N) :- Then the boundary line runs from point **'Q'** and meets point **'N'** as noted on the map along western boundary of Compartment Nos. 177, 189 which is starting point.

Buffer area for Nagarjunasagar Srisailam Tiger Reserve – X (Project Tiger, Markapur)

The buffer comprising following compartments which are adjoining to Rajiv Gandhi Wildlife Sanctuary boundary Compartment Nos. 91,383, 90, 382 in ENB XII of Dornal Range, Compartment Nos. 67, 377 and 378 of ENB-VI RF of Dornal Range and Compartment No.47 in ENB-VI-C RF of Korraprolu Range.

Buffer area for Nagarjunasagar Srisailam Tiger Reserve – XI (Project Tiger, Markapur)

North (R to S):- The Buffer boundary start from point **'R'** as noted on the map (North-west corner of Compartment No. 36 in Cumbum R.F of Korraprolu Range), and runs along with Rajiv Gandhi Wildlife boundary towards North-east direction with northern boundary of Compartment No. 19 (upto North – East corner) in Markapur R.F of Dornal Range, then the boundary runs towards Southern direction along with Eastern boundary of Compartment No. 19, then boundary line runs towards South – West direction upto South – East corner of Compartment No. 36 in Cumbum R.F. of Dornal Range. Then the boundary line runs towards Eastern direction Zig – Zag manner along with Northern boundary of Compartment Nos. 40,38,46,49 in Cumbum R.F. of Dornal Range. Then boundary line runs towards North – East direction along with the North – West boundary of Compartment Nos. 49,53,373 upto North – East corner of Compartment No. 53, then the boundary line runs towards South – West direction upto South – East corner of Compartment No. 53 in ENB – VI RF of Dornal Range. Then boundary line runs towards South – East direction along with Eastern boundary of Compartment No. 52 and meets South – East corner of Compartment No. 52. Then the boundary line runs towards North – East direction along with boundary of Compartment No. 52, 60,61,54 (North – West corner of Compartment No. 54) in Cumbum R.F. of Dornal Range. Then the boundary line runs towards Eastern direction in Zig –

Zag manner along with boundary of Compartment No. 54 in Cumbum R.F and Compartment Nos.374, 55,376, 375 in ENB –VI RF of Dornal Range and Compartment Nos. 315,316,317 & 318 in ENB V RF of Markapur Range and meets point **'S'** as noted on the map (North-east corner of Compartment No. 318).

East (S-T-U-V) :- Thence, the boundary line runs toward southern direction along with boundary of Compartment Nos. 318, 319 and 320 of ENB V RF of Markapur Range, and meets point **'T'** as noted on the map (South-east corner of Compartment No 320).Then the Buffer boundary start from point **'T'** as noted on the map (West-north corner of Compartment No.321 in ENB-V of Markapur Range). Then the boundary line runs towards western direction in zig zag manner along with southern boundary of Compartments Nos.321, 317,316, 315 in ENB-V RF of Markapur Range. Thence, the boundary line runs towards southern direction along the eastern boundary of Compartment Nos.322, 291, 292 & 301 and then the boundary line turned with South – East direction along with Compartment Nos. 307, 308 & 302 in ENB IV RF of Markapur Range and meets point **'U'** as noted in the map (North-east corner of Compartment No. 302). Then the boundary line runs from point **'U'** towards Southern direction in zig-zag manner along the southern boundary of Compartment Nos. 302, 303, 304, 306 & 305 of ENB IV (P) RF of Markapur Range and Compartment No. 284 of ENB III (P) RF of Markapur range and reaches South – West corner of Compartment No. 284 in ENB III RF of Markapur Range and meets point **'V'**.

South (V-W-X-Y):- Then the boundary line runs towards North - west direction upto North – East corner of Compartment No.298 along with the Compartment Nos. 284, 283, 282 & 298 of ENB IV RF of Markapur Range. Then the boundary line runs towards Western direction upto Compartment Nos. 263 & 261 of Cumbum R.F of Markapur Range and meets point **'W'** as noted in the map (North-West corner of Compartment No. 261 & 263). Then the boundary line runs towards northern direction in zig-zag manner along with western boundary of Compartment Nos. 263, 264, 256, 274, 275, 276, 271 & 270 in Cumbum RF of Markapur Range and meets point **'X'** as noted

on the map. Then the boundary runs towards easterly direction along Compartment Nos. 267, 266, 45, 44 and 43. Then the boundary line runs towards westerly direction along the Compartment Nos. 50, 41 and 10 and meets point **'Y'**.

West (Y-R):- Then the boundary line runs towards northern direction in zig-zag manner along with Gundla Bramheswaram sanctuary boundary i.e., core of NSTR and also with western boundary of Compartment Nos. 10, 12 in Cumbum R.F of Dornal Range. Then the boundary line runs towards North – East direction along with Gundla Bramheswaram Sanctuary boundary and also Southern boundary of Compartment Nos. 12, 9 in Cumbum R.F. of Dornal Range. Then the boundary line runs towards Northern direction along with western boundary of Compartment Nos. 35, 36 and meets starting point **'R'** as noted on the map (North-west corner of Compartment No. 36).

Buffer area for Nagarjunasagar Srisailam Tiger Reserve – XII (Project Tiger, Markapur)

North (Z-AA):-The Buffer boundary start from point **'Z'** as noted on the map (West – North corner of Compartment No.255 in ENB-III RF of Markapur Range). Thence the boundary line runs towards West - East direction in zig-zag manner along with Compartment Nos. 255, 262, 281 & 280 in ENB-III RF of Markapur Range and meets point **'AA'** as noted on the map (North-East corner of Compartment No. 280).

East (AA-BB):-Then the Buffer boundary start from point **'AA'** as noted on the map (North - East corner of Compartment No.280 in ENB-III RF of Markapur Range). Thence the boundary line runs towards Southern direction along with the Compartment Nos. 279, 278 and 277 and then boundary line runs in north – east corner direction of Compartment No. 277 and then boundary line turns towards south – west direction of Compartment No. 253 of ENB – III RF of Markapur Range and meets point **'BB'** as noted on the map (South-West corner of Compartment No. 253).

South (BB –CC):- Then the Buffer boundary start from point **'BB'** as noted on the map (South – West corner of Compartment No.253 in ENB-III RF of Markapur Range). Thence the boundary line runs towards South - North direction in zig-zag manner along with Compartment Nos. 253, 252 & 251 in ENB-III RF of Markapur Range and meets point **'CC'** as noted on the map (North-West corner of Compartment No. 251). Then the Buffer boundary (North – West corner of Compartment No.251 in ENB-III RF of Markapur Range) runs towards Western direction in zig-zag manner along with the Compartment Nos. 251, 250, 249 & 255 in ENB-III RF of Markapur Range and meets starting point **'Z'** as noted on the map (South - East corner of Compartment No. 255).

Buffer area for Nagarjunasagar Srisailam Tiger Reserve – XIII (Project Tiger, Markapur)

West (DD to EE) :- The Buffer boundary start from point **'DD'** as noted on the map (West – North corner of Compartment No.248 in ENB-II RF of Markapur Range). Thence the boundary line runs towards South – East corner direction in zig-zag manner along with Compartment Nos. 248 & 254 in ENB-II RF of Markapur Range and meets point **'EE'** as noted on the map (North-East corner of Compartment No. 254).

East (EE-FF) :- Then the Buffer boundary starting from point **'EE'** as noted on the map (North – East corner of Compartment No.254 in ENB-II RF of Markapur Range). Thence the boundary line runs towards East – South corner direction in zig-zag manner along with Compartment Nos. 254, 246 & 247 in ENB-II RF of Markapur Range and meets point **'FF'** as noted on the map (South - West corner of Compartment No. 247). Thence the boundary line runs towards South – West corner direction in zig-zag manner along with Compartment Nos. 247 & 248 in ENB-II of Markapur Range and meets starting point **'DD'** as noted on the map (West-North corner of Compartment No. 248).

Buffer area for Nagarjunasagar Srisailam Tiger Reserve – XIV (Project Tiger, Markapur): Compensatory Afforestation area falls in Korraprolu Range as noted on the map.

Buffer area for Nagarjunasagar Srisailam Tiger Reserve – XV (Project Tiger, Markapur): Compensatory Afforestation area falls in Dornal Range as noted on the map.

Buffer area for Nagarjunasagar Srisailam Tiger Reserve – XVI (Project Tiger, Markapur): Compensatory Afforestation area falls in Markapur Range as noted on the map.

Buffer area for Nagarjunasagar Srisailam Tiger Reserve – XVII (Project Tiger, Giddalur)

North (A-B):- The Boundary of Buffer starts from point **'A'** as delineated in map (North - West corner of Compartment No. 818 in Cumbum RF of Turimella Range) and runs towards Eastern direction along the Northern boundary of Compartment Nos. 818, 819, 820, 821, 822 of Cumbum RF of Turimella Range of Project Tiger, Giddalur and meets point **'B'** as noted in the map (Northern corner of Compartment No. 822 of Cumbum RF). The boundary line is common boundary of Compartment Nos.10, 41 of Cumbum RF of Dornal Range of Project Tiger, Markapur and southern boundary of Compartment No.50 of ENB-VI RF and also Compartment No. 43 of Cumbum RF of Dornal Range of Project Tiger, Markapur.

East (B-C):- Thence the boundary line runs towards South-East direction along with Eastern boundary of Compartment No.822 and southern boundary of Compartment No. 821 of Cumbum RF of Project Tiger, Giddalur and runs Northern boundary of Compartments No. 825, 824 and Eastern boundary of Compartment Nos. 823, 814 of ENB-III RF of Turimella Range of Project Tiger, Giddalur and meets point **'C'** as noted in the map (South west corner of Compartment No. 814 of ENB-III RF).

South (C-D):- Thence the boundary line runs in North – West direction along the Western boundary of Compartment No.814 of ENB-III RF and runs along Southern boundary of Compartment Nos. 813, 815, 816 of ENB-III RF and runs towards Eastern boundary of Compartment.No.804 of ENB-III RF of Turimella Range and meets point **'D'** as noted in the map (South – West corner of Compartment No. 804 of ENB-III RF).

West (D-A):- Then the boundary line runs towards North-West direction along the western boundary of Compartment Nos. 804, 817, 808 of ENB-III RF of Tirumella Range of Project Tiger, Giddalur. Then the boundary line runs towards northerly direction along the western boundary of Compartment Nos.808 and 809 of Cumbum RF of Turimella Range of Project Tiger, Giddalur and meets starting point **'A'** as noted in the map. The boundary line is Common boundary of Gundla Brahmeswaram Wildlife Sanctuary.

Buffer area for Nagarjunasagar Srisailam Tiger Reserve – XVIII (Project Tiger, Giddalur)

North (E– F) :- The Boundary of Buffer starts from point **'E'** as delineated in the map (North - West corner of Compartment No. 797 in Cumbum RF of Turimella Range) and runs in Eastern direction along the Northern boundary of Compartment Nos. 797,796 of Cumbum RF. Then the boundary line runs in southern direction along the eastern boundary of Compartment No.795 Cumbum RF and touches north east corner of CompartmentNo.836 of Yerraguntla RF. Thence it moves in North-Eastern direction in a zig–zag manner along the northern boundary of Compartment Nos.807,805,755 of ENB-II RF of Turimella Range, Project Tiger, Giddalur and meets point **'F'** as noted in the map (North- East corner of Compartment No. 755 of ENB-II RF).

East (F-G):- Thence the boundary line runs towards Southern direction in zig-zag manner along the Eastern boundary of Compartment Nos. 755,756,757 of ENB-II RF of Turimella Range, Project Tiger, Giddalur and meets point **'G'** as noted in the map (South-East corner of Compartment No. 757 of ENB-II RF).

South (G-H):- Thence the boundary line runs in South – West direction along the Southern boundary of Compartment No. 757 of ENB-II RF and also Western boundary of Compartment No. 757 of ENB-II RF and touches the Southern boundary of Compartment No.754 of ENB-II RF and runs towards southern direction along Eastern boundary of Compartment No.753 of ENB-II RF. Thence it turns towards northerly direction and moves along the Western boundary of Compartment No.753 of ENB-II RF, 792 of Ambavaram RF, 791

of ENB-II RF. Thence it turns towards westerly direction and moves along the southern boundary of CompartmentNo.790 of ENB-II RF and runs towards southern direction along Eastern boundary of Compartment Nos.793, 783 of Cumbum RF of Giddalur Range and meets point **'H'** as noted in the map (South – East corner of compartment No. 783 of Cumbum RF).

West (H-E):- Then the boundary line runs towards Western direction along the Southern boundary of Compartment No.783 of Cumbum RF and then runs towards northerly direction in zig – zag manner along the western boundary of Compartment Nos.783, 793, 789, 788 and 797 of Cumbum RF of Turimella Range of Giddalur Division and meets starting point **'E'** as noted in the map. The boundary line is Common boundary of Gundla Brahmeswaram Wildlife Sanctuary i.e., core of NSTR.

Buffer area for Nagarjunasagar Srisailam Tiger Reserve – XIX (Project Tiger, Giddalur)

North (I–J): – The Boundary of Buffer starts from point **'I'** as delineated in map (Northern corner of Compartment No. 782 of ENB-I RF of Turimella Range) and runs towards Southern direction along the Eastern boundary of Compartment Nos. 782,772 of ENB-I RF and runs easterly direction along western boundary of Compartment Nos. 760,761, 762 of Ambavaram RF of Turimella Range, Giddalur Division and meets point **'J'** as noted in the map (Northern corner of compartment No. 762 of Ambavaram RF).

East (J-K):- Thence the boundary line runs towards Southern direction in a zig zag manner along the Eastern boundary of Compartment Nos. 762,761,763, 764, 765 of Ambavaram RF of Turimerlla Range, Project Tiger, Giddalur and meets point **'K'** as noted in the map (Southern corner of compartment No. 765 of Ambavaram RF).

South (K-L):- Thence the boundary line runs Northerly direction and moves along the Western boundary of Compartment No. 765 of Ambavaram RF and meets Compartment No.759, then the line runs towards Southerly direction and moves along eastern boundary of Compartment No. 758 and runs

towards northerly direction along the western boundary of Compartment Nos.758, 759 and 760 of Ambavaram RF. Thence the boundary moves towards westerly direction and passes through the southern boundary of Compartment Nos.771, 770. Then the lines runs towards southern direction and moves along the eastern boundary of Compartment Nos.773, 774 of ENB-I RF of Turimella Range, Project Tiger, Giddalur and meets point **'L'** as noted in the map (South – West corner of Compartment No. 766 of ENB-I RF).

West (L-I):- Then the boundary line runs towards northerly direction in zig-zag manner along the Western boundary of Compartment Nos.766, 774, 773, 770, 771 and 782 and reaches the starting point **'I'** (Northern corner of Compartment No.782). The boundary is also common boundary of Gundla Brahmeswaram Wildlife Sanctuary i.e., core boundary of NSTR.

Buffer area for Nagarjunasagar Srisailam Tiger Reserve – XX (Project Tiger, Giddalur)

North (M –N):- The Boundary of Buffer starts from point **'M'** as delineated in map (North - West corner of Compartment No. 680 in Uyyalawada RF of Gundlakamma Range) and runs towards Eastern direction along the northern boundary of Compartment Nos. 680, 681 of Uyyalawada RF and 676 of Uyyalawada Extn. RF of Gundlakamma Range or Project Tiger, Giddalur and meets point **'N'** as noted in the map (North-East corner of Compartment No.676 of Uyyalawada RF). The boundary is also common boundary of Gundla Brahmeswaram Wildlife Sanctuary i.e., core boundary of NSTR.

East (N-O):- Thence the boundary line runs in Southern direction in zig-zag manner and moves along the Eastern boundary of Compartment Nos. 675, 677 of Uyyalawada Extn.RF; 674, 668 of Uyyalawada RF; 657, 658, 659, 645, 646, 647 of Uyyalawada Extn.RF, 636, 637 of Uyyalawada RF of Giddalur Range of Project Tiger, Giddalur and meets point **'O'** as noted in the map (South- East corner of Compartment No. 637).

South (O-P):- Thence the boundary line runs in Western direction and moves along the Southern boundary of Compartment Nos. 637, 638, 634,633 and meets at south west corner of point of Compartment No.632 and meets point **'P'** as delineated in the map (South –West corner of Compartment No.631 of Uyyalawada RF).

West (P-M):- Then the boundary line runs towards Northern direction along the Western boundary of the Compartment Nos.631,641,653 and 663 of Uyyalawada RF of Giddalur Range. Then the boundary line runs in northerly direction along the eastern boundary of Compartment No.481of Sirvel RF of Chalama Range of Nandyal Division and then runs along western boundary of the Compartment Nos. 664, 669, 678, 679, 680 of Uyyalawada RF of Gundlakamma Range of Giddalur Division and meets starting point **'M'** as noted in the map (North west corner of Compartment No.680). The boundary line is also common to the eastern boundaries of Compt. Nos.482, 483, 484, 485, 486 and 487 of Sirivel RF of Chalama Range of Nandyal Division.

Buffer area for Nagarjunasagar Srisailam Tiger Reserve – XXI (Project Tiger, Giddalur): Compensatory Afforestation area falls in Turimella Range as noted on the map.

Buffer area for Nagarjunasagar Srisailam Tiger Reserve – XXII (Project Tiger, Giddalur):

North (Q to R):- The boundary of buffer starts from point **'Q'** as noted on the map (North – West corner of Compartment No. 752) and runs towards North – East direction along with boundary of Compartment Nos.747and meets point **"R"**.

East (R to S):- Then the boundary line runs in Southern direction along with eastern boundaries of Compt. Nos.748, 749,751 and 750 and meets point **'S'** as noted on the map (South -east corner of Compartment No.750).

South (S to T):- Thence the boundary line runs towards western direction along the southern boundaries of compartment Nos.750 and 745 and meets point **'T'**.

West (T to Q) :- Then the boundary line starts from station **'T'** and runs towards northern direction along western boundary of Compartment Nos.745 and 746 and meets point **'Q'**.

Buffer area for Nagarjunasagar Srisailam Tiger Reserve – XXIII (Project Tiger, Giddalur):

North (U to V):- The boundary of buffer area outside the sanctuary starts from point **'U'** as noted on the map (North – West corner of Compartment No. 652) and runs towards Eastern direction along with northern boundary of Compartment Nos.652and meets point **"V"**.

East (V to W):- Then the boundary line runs in Southern direction along with eastern boundaries of Compt. Nos. 652,639 and 640 and meets point **'W'** as noted on the map (South -east corner of Compartment No.640).

South (W to X):- Then the boundary line runs towards western direction along the southern boundary of compartment No.640 and meets point **'X'**.

West (X to U):- Then the boundary line starts from station **'X'** and runs towards northern direction along western boundary of Compartment Nos.640, 639 and 652 and meets point **'U'**.

Buffer area for Nagarjunasagar Srisailam Tiger Reserve – XXIV (Project Tiger, Nandyal)

North (A-B):- The Boundary line starts at point **'A'** (Northern corner of Compartment No.537) and moves towards south easterly direction along the eastern boundary of Compartment No.537, then the line runs towards easterly direction along the northerly boundary of Compartment No.507 and then it runs in northerly direction along the western boundary of Compartment Nos. 513,516 and 515 of Nandyal Extn.II RF of Chalama Range. Then the boundary line runs in zig-zag manner along the eastern boundaries of Compartment Nos.515, 516, 517, 518 and northern boundaries of Compartment Nos. 519, 525, 524, 523 and to north east corner 487 and

reaches point **'B'** (North East corner of Compartment No. 487 of Sirvel RF of Chelama Range). The boundary line is also common boundary of Gundla Brahmeswaram Wildlife Sanctuary i.e., core boundary of NSTR.

East (B-C):- From point **'B'** the line moves in southerly direction along the eastern boundary of Compartment Nos.487, 486, 485, 484, 483, 482, 481 466, 465, 456, 455 453, 452 and 439 of Sirvel RF of Chalama Range and reaches point **'C'** (south east corner of Compartment No.439). The boundary line is common to western boundary of Compt. No.680,679, 678, 669, 664, 663, 653, 641, 631.

South (C-D):- Thence the boundary moves towards westerly direction along the southern boundary of Compartment Nos.439, 440, 441, 442, 443, 444, 445 & 355 of Sirvel RF of Rudravaram Range and reaches point **'D'** (South west corner of Compartment No.355).

West (D-A):- Thence the boundary line runs towards northerly direction in zigzag manner along the western boundary of Compartment Nos.354, 353, 352, 350, 349, 347, 346, 470, 471, 472 of Sirvel RF; 503, 504 and 505 of Sirvel Extn. RF; Southern boundary of Compt. No.509 of Nandyal RF; western boundary of Compartment No.508 of Nandyla RF; eastern boundary of Compartment No.507,506 of Nandyal RF of Chalama Range and runs along southern boundary of Compartment No.506. Then the boundary moves towards north along the western boundary of Compartment No.506, 536, 537 and reaches the starting point **'A'**.

Buffer area for Nagarjunasagar Srisailam Tiger Reserve – XXV (Project Tiger, Nandyal)

North (E-F):- The Boundary line starts from point **'E'** as delineated in the map and moves towards easterly direction along the northern boundary of Compartment No. 605 of Nandyal Ext-II RF of Bandi-Atmakur Range and meets point **"F"**.

East (F-G):- Then the boundary line starts from point **"F"** and runs towards southerly direction along the eastern boundary of Compartment Nos. 605, 604, 603A, 603, 601, 600, 599, 598, 542, 541, 540, 539, 538 and meets point **'G'** till its touches Mahanandi temple (south east corner of Compartment No. 538 of Nandyal Ext.I RF of Nandyal Range). The boundary is also common boundary of Gundla Brahmeswaram Wildlife Sanctuary i.e., core boundary of NSTR.

South (G to H):- Thence, the boundary line moves towards westerly direction along the southern boundary of Compartment No. 538 of Nandyal Extn.I RF and 539 of Nandyal Extn.II RF and reaches point **"H'**.

West (H to E):- Thence the boundary line runs towards northerly direction along the western boundary of Compartment Nos. 539, 540 of Nandyal Extn.I RF ; Compartment Nos. 541, 542 598, 599, 600, 601, 602, 603A, 604, 605 of Nandyal Extn.II RF of Bandi Atmakur Range and reaches the starting point **'E'**.

1) The local communities are entitled to continuation of the rights and concessions as admitted ate the settlement of Forest Blocks until relocation.

ANNEXURE-II
GOVERNMENT OF ANDHRA PRADESH
FOREST DEPARTMENT

Wildlife - Notification of Nagarjunasagar-Srisailam Wildlife Sanctuary under Section 26-A of Wildlife (P) Act., 1972 - Notification - issued.

Environment Forests Science & Technology (For-III) Department

G.O.M.S. No 485, EFS &T (For III) Department dated 05/07/1978. From the Principal Chief Conservator of Forest Ref. No. 8533/98-WL1, Dt. 15/04/1998.

* * *

The appended Notification will be published in an extraordinary issue of the Andhra Pradesh Gazette.

2) The Director, Printing, Stationery and stores purchase Department is requested to supply 200 copies of the printed Gazette notification to the Prl. Chief Conservator of Forests, Andhra Pradesh, Hyderabad and (50) copies to the government.

3) The Collectors Kurnool, Guntur, Prakasam, Mahaboobnagar and Nalgonda Districts is requested to republish the Notification in their District Gazette and take necessary further action under Chapter - IV of the Wildlife (Protection) Act, 1972.

(BY ORDER AND IN THE NAME OF THE GOVERNOR OF ANDHRA PRADESH)

Sd/- C.S. RANGACHARI,
SPECIAL CHIEF SECRETARY TO GOVERNMENT

NOTIFICATION

In exercise of the powers conferred by Section 26-A of the Wildlife (Protection) Act, 1972 (Central Act No 53 of 1972) the Governor of Andhra Pradesh hereby declares the areas specified in the Schedule to be a Wildlife Sanctuary which shall be called "Rajiv Gandhi Wildlife Sanctuary (Nagarjunasagar Srisailam Wildlife Sanctuary)".

2. The notification shall come into force with effect from the date of Publication of the Notification in Andhra Pradesh Gazette.

THE SCHEDULE

Name of the Districts	:	1) Mahaboob Nagar 2) Nalgonda 3) Guntur 4) Prakasam 5) Kurnool.
Names of the Forest Division	:	1) Achampet 2) Nalgonda 3) Guntur 4) Markapur 5) Atmakur.
Name of the Taluks	:	1) Achampet 2) Devarkonda 3) Miryalaguda 4) Macherla 5) Y. Palem. 6) Atmakur.
Name of the Forest Ranges	:	1) Amarabad 2) Mannanur 3) Devarakonda 4) Miryalaguda 5) Macherla 6) Gunjivaripalli 7) Yerragondapalem 8) Pecheruvu.
Name of the Sanctuary	:	Rajiv Gandhi Wildlife Sanctuary (Nagarjunasagar-Srisailam Wildlife Sanctuary)
Area of the Sanctuary	:	3,56,809.00 ha.

THE SCHEDULE

Sl No	Name of the District	Name of the Forest Division	Name of the Taluks	Name of the Forest Ranges	Area of the Sanctuary in Ha.
1.	Mahaboob-nagar	Achampet	Achampet	i) Amarabad ii) Mannanur	1,75,000
2.	Nalgonda	Nalgonda	Devarkonda Miryalaguda	i) Devarkonda ii) Miryalaguda	41,637
3.	Guntur	Guntur	Macherla	Macherla	32,554
4.	Prakasam	Markapur	Y.Palem	i) Gaunjivaripalli ii)Yerragondapalem	66,518
5.	Kurnool	Atmakur	Atmakur	i) Pecheruvu	41,100

Boundaries of the Sanctuary:
The boundaries of the Sanctuary as delineated in the map kept in the office of the Chief Conservator of Forests are as follows.

North (A-B): The boundary of the sanctuary starts from the station "A" denoted on the map (permanent masonry pillars bearing sanctuary mark constructed on the ground) which is North-West corner of the Forest Block Nidgul in Nalgonda Forest Division and it runs in easterly direction in a zig-zag manner along the Northern boundary of Nidgul Reserve Forest upto a point fixed with permanent masonry pillar bearing sanctuary mark constructed on the ground where the Reserve Forests boundary touches the maximum flood level of 179 M. of Nagarjunasagar Reservoir near the food of the hillock 341M thence along the said M.F.L. in Northerly and Westerly direction in zig-zag manner to the confluence of Peddavagu with Nagarjunasagar; then it crosses Peddavagu and runs along the said M.F.L line to a point (Permanent Masonry pillar bearing sanctuary mark constructed on the ground) where it comes close in the southern boundary of Suryaraopet Reserve Forests after passing Suryaraopet village; thence along the western boundary of the said Reserve Forests in a general northern, Eastern and Southern directions passing the villages of Suryaraopet, Kannapur, Puttamgondi Tanda, Chingum and Kadutanda to a point where the eastern boundary in the said Reserve Forests comes close to the M.F.L of Nagarjunasagar and where a small streamlet also joins Nagarjunasagar. Then the line runs along the M.F.L of Nagarjunasagar in general northern and southern directions to a pint where the said M.F.L. line comes close to western boundary of Rayaram Reserve Forests; at the foot of the hill 248' lying in the said Rayaram Reserve Forests; thence towards general north and east and other directions along the Rayaram Reserve Forests boundary till it meets the M.F.L. line of Nagarjunasagar. Then it runs along the said M.F.L. line of Nagarjunasagar in a general west, north, east and southern directions till it meets Nelikal Reserve Forests boundary towards west and other directions in a zig-zag manner and crossing state highway from Hyderabad to Vijayapuri North and running along the Northern, eastern and southern boundaries of Nellikal Reserve Forests upto a point where the southern boundary of the said Reserve Forests touches th limits of the northern bank of River Krishna, then the boundary runs along the said river bank, limits towards general easterly direction upto a masonry pillar with sanctuary mark constructed

at the bi-junction point of the limits of the western bank of Hallia River upto a point where the extreme north east corner of Rajavaram village touches the western bank of Hallia River. Thus it crosses the Hallia river and meets the point 'B' which is a masonry pillar with sanctuary mark constructed for the purpose.

East (B-C): Thence the boundary runs along the eastern bank of river Hallia upto the River Krishna. then it crosses the River Krishna and meets the masonry pillar with sanctuary mark constructed on the limits of the southern bank of the said river where the foot path-cart track going to Mallavaram (V) crosses the limits of the said southern bank of Krishna River.

Then the boundary runs along the said river Bank limits towards west till it meets the boundary of Tummurukota Reserve Forests; thence along the eastern and southern boundaries of Tummurukota Reserve Forests and crosses.

Chandravanka River at Ethipothala Water falls. Thence it follows the southern boundary of Pasuvemula Reserve Forests and crosses the state highway leading to Vijayapuri South. then it turns towards general northerly direction and runs along the said Reserve Forests boundary till it meets the Public Works Department limits of the southern bank of River Krishna; thence along the said Public Works Department limits of southern bank of River Krishna, it runs towards wet upto a point (at sluice) on the southern bank of Nagarjunasagar Right Bank Canal or Jawahar Canal; thence along the Nagarjunasagar limits till the later touches the northern boundary of the Pasuvemula Reserve Forests bit abutting the Nagarjunasagar. A masonry pillar with sanctuary mark is constructed at the bi-junction of the limits of Nagarjunasagar and Pasuvemula Reserve Forests. Thence towards south, east and general southerly direction along the Northern and Eastern boundaries of Pasuvemula Reserve Forest (Portion) till it meets the boundary of Kadlagunta Reserve Forests till it meets Jarrivagu thence crossing Jarrivagu the boundary runs along the common boundary of Gangulagunta and Muthukur Reserve Forests till the said common Reserve Forests boundary meets the common boundary of Guntur and Prakasam Districts at the tri-junction point of Gangalagunta Reserve Forests, Muthukur Reserve Forests of Guntur District and Markapur Reserve Forests of Prakasam District (Markapur Division), which is pint 'C' denoted on the map.

South(C-D): Then the boundary of the sanctuary runs along the Chinavaram vagu flowing in a general southernly direction on the eastern side of Carnipanta (v) through Markapur Reserve Forest s in Prakasam district upto the point where the said foot-paths from Naratadikulapenta to Garripenta to Venkatadripalem(v) then it follows the said foot-path running through the Markapur Reserve Forests towards Venkatadripalem (v) till it meets the said Reserve Forests boundary thence towards west south and westerly and other directions along the boundary of the said Markapur Reserve Forests enclosing within the sanctuary the entire areas of (i) Eastern Nallamalai Block of (Venkatadripalem) Reserve

Forests and (ii) Eastern Nallamalai Block No.IX (Kollurgula) Reserve Forests to it meets the quadri-junction point of the boundaries of Nandikotkur Reserve Forests, Markapur Reserve Forests, Cumbam Reserve Forests and Nandyal Reserve Forests at Rollapenta (v) (vide C1 in the map).

Then the boundary runs along the common Reserve Forests boundary of Nandikotkur and Nandyal reserve Forests towards west to the trijunction point of the boundaries of Guvvalagunta Reserve Forests Block 'C' Nandikotkur Resergve Forests and Nandyal Reserve Forests at Bairluti gudem (v) of Atmakur taluk. Then it runs along the common

reserve Forests boundary of Nandikotkur Reserve Forests and Guvvalakunta Reserve Forests Block 'C' and thereafter over a short distance along boundary of Nandikotkur Reserve Forests upto a point where the foot-path from Guvvadagunta - Chintal Banda - Nudemamudapenta to Regulapayapenta crosses the said reserve Forests boundary marked 'D' in the map.

West (D-A): Then it runs along the said foot-path to the southern limits of the river Krishna near Regulapayapenta; thence along the said southern limits of River Krishna over a distance of about 3 kms. upto a point on the said river bank where a masonry pillar bearing sanctuary mark is constructed. The masonry pillar will be facing the confluence of Yemalapayavagu on Patmakolevagu (on the northern said) wth river Krishna. Then the boundary crosses the River Krishna and meets a masonry pillar bearing sanctuary mark constructed on the western park of Yemalapaya vagu. then it runs along the said vagu and the western boundary of Amarabad Reserve Forests of Achampet Division passing village lingal, billakal, Banal etc., upto a point where the southern limits of the state high way from Hyderabad to Srisailam Crosses the said Reserve Forests line south-east of Rangapur (v) and then the line crosses the highway and runs along the Reserve Forests line to northern direction upto the foot-path from Amarabad to Bommampalli and the line runs along this foot-path in southerly direction and joins the Amarabad enclosure line and then takes a right-turn and return south-westerly direction along the enclosure line and crosses the foot-path Macharam - Ainole and State highway - Hyderabad - Srisailam and then runs southerly and other directions along the said enclosure line passing Mannanur, Amarabad. Tirumaiapur, Laxmapur, Chtlankunta villages' upto a point where the foot-path from Venkeswaram to Gonepur village crosses the said enclosure line. Then it runs along the said Amarabad Reserve Forest boundary towards south along the eastern limits of said foot-path till it crosses the Amarabad Reserve Forests external boundary. Then it runs and other directions upto a point where the Reserve Forests boundary touches the Dindi River near Bakalingalapalli (v). Then it runs along the western southern bank of River Dindi over a distance of 15 (fifteen) Kms. to a point where masonry pillar, bearing sanctuary mark is constructed. Then it crosses the said river and meets the bi-junction of Nidgal Reserve Forests boundary and the northern bank Dindi river on the southern side of the hillock 1115'. Then it runs along the said Reserve Forests boundary towards north and other directions to meet the starting point 'A'. Besides the area specified above the following Reserve forests also shall be within this sanctuary.

1. Rajavaram R.F - Nalgonda District
2. Azampur - Nalgonda District

N.B:- All the enclosure within the Reserve Forests and villages and private lands covered in the above specified limits shall stand included for the purpose of the notification.

S.No	Name of the Reserve Forest	Area in ha	Tot. Area
1	Nidgul	30,140.00	
2.	Azampur	342.00	
3.	Suryaraopet	1,077.00	
4.	Rayaram	3,730.00	
5.	Nellikal	3,182.00	
6.	Rajawaram	3,166.00	41,637.00
7.	Tummurkota (Block No.II, III & IV)	277.00	
8.	Pasevemula	5397.00	
9.	Kadla Gunta	19,135.00	
10.	Gangala Gunta	7,745.00	32,554.00
11.	Markapur (Part)	64,574.00	
12.	Eastern Nallamala Block VIII	884.00	
13.	-do- Block IX	1,060.00	66,518.00
14	Nandikotkur R.F.(part)	41,100.00	41,100.00
15.	Amarabad R.F.(Part)	1,75,000.00	1,75,000.00
	TOTAL		**3,56,809.00**

The Field Director (Project Tiger) Srisailam who is authorized to perform the functions of the District Collector vide G.O.M.S. No 39 EFS & T(for III) Department, dated 17/4/1997 has determined the existence, the Nature and the extent of the rights of the persons in the Rajiv Gandhi Wildlife Sanctuary (Nagarjunasagar - Srisailam Tiger Reserve) vide his proceeding No 5039/96/PT8 dated 2/4/1998, is as follows.

1. The local communities are entitled to the rights and concessions as admitted at the time of settlement of Forest Blocks.

Sd/- C.S. RANGA CHARI,
Spl., Chief Secretary to Government

ANNEXURE-III

Registered No. HSE-49/2009-2011. [Price: Re. 0-50 Paise.

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THE ANDHRA PRADESH GAZETTE

PART-I EXTRAORDINARY

PUBLISHED BY AUTHORITY

No. 136] HYDERABAD, FRIDAY, MARCH 26, 2010.

NOTIFICATIONS BY GOVERNMENT

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ENVIRONMENT, FORESTS, SCIENCE AND TECHNOLOGY DEPARTMENT

(For. II)

GUNDLA BRAHMESWARAM WILDLIFE SANCTUARY NOTIFIED UNDER SECTION 38 V OF WILDLIFE (PROTECTION) ACT, 1972 (ACT No. 53 OF 1972).

[G.O.Ms. No. 50, Environment, Forests, Science and Technology (For. II), 18th March, 2010.]

In exercise of the powers conferred by Section-38 V of the Wildlife (Protection) Act, 1972 (Act No. 53 of 1972) the Government of Andhra Pradesh hereby declares the entire Gundla Brahmeswaram Wildlife Sanctuary area specified in the schedule to be a extended core area / critical Wildlife habitat to Nagarjunasagar Srisailam Tiger Reserve for the purpose of Tiger Conservation, which shall be called as Extended core / inviolate area / space to Nagarjunasagar Srisailam Tiger Reserve.

2. The Notification shall come into force with effect from the date of Publication of Notification of Andhra Pradesh Gazette.

SCHEDULE

1. Name of the Districts	:	1. Kurnool 2. Prakasam
2. Name of the Mandals	:	1. Velgode 2. Atmakur 3. Bandi Atmakur 4. Giddalur 5. Dornal
3. Name of the Forest Division	:	1. Atmakur 2. Nandyal 3. Giddalur 4. Markapur

joining Motuvagu at station B5 and then line runs along Motuvagu (including it) upto the point where Motuvagu touches the Western boundary of Eastern Nallamalai Reserve Forest at Station B6. Thence the boundary line runs in southerly direction along the common boundary of Eastern Nallamalai-1 Reserve Forest and Cumbum Reserve Forest upto Giddalur -Nandyal road (151 KM stone) i.e., Station C noted on the map.

South (C to D): From the point 'C' which is the South East corner of Cumbum Reserve Forest and South - West corner of Eastern Nallamalai Reserve Forest, the Southern boundary runs in Westerly direction along the Giddalur-Nandyal road (Nandikanuma road which is also the Southern boundary of Cumbum Reserved Forest till the said road meets the Railway line) thence the Southern boundary runs along the said Railway line (include it) upto a point where the Eastern boundary of Nandyal Extension-1 Reserve Forest crosses Railway line, and thence the line runs along the common boundary of Nandyal Reserve Forest and Nandyal Extension-1 Reserve Forest upto 420 K.M. (Railway line) to meet station-D noted in the map.

West (D to A): From Station-D line runs along the Western boundary of Nandyal Reserve Forest which is also a fire line till the line meets the Velgode GBM forest Road and thence the line runs along the Forest road till it meets the bund of Velgode (Telugu Ganga Project) balancing Reservoir in Southern side and Western side. Thence the boundary follows the full Reservoir in Southern side and Western side. Thence the boundary follows the full reservoir level line (+264.70) upto the point where the Pasurutala vagu touches the full Reservoir in level line and thence along the said vagu (including the vagu) to the point where it touches the 220 K.V. line and then the boundary runs in North-East direction upto Kurnool-Guntur road to Station-A, i.e., the starting point as noted in the Map.

All the enclosures with in the Reserve Forest and Villages and private lands covered in the above specified limits shall stand included in the sanctuary for the purpose of this notification. The rights allowed at the time of the settlement of the Reserve Forest included in the sanctuary shall stand valid until extinguished other wise by an order of competent authority. The area of the Reserve Forest included in the sanctuary, is shown below.

N.B: The adjoining village communities are entitled to the rights and concessions as admitted at the settlement of Forest Blocks until relocation.

JANAKI R. KONDAPI,
Special Chief Secretary to Government.

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RIGHT TO INFORMATION

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THE ANDHRA PRADESH GAZETTE

PART–I EXTRAORDINARY

PUBLISHED BY AUTHORITY

No. 432] HYDERABAD, TUESDAY, JULY 31, 2012.

NOTIFICATIONS BY GOVERNMENT

—x—

ENVIRONMENT, FORESTS, SCIENCE & TECHNOLOGY DEPARTMENT

(FOR.II)

AMENDMENT TO THE GUNDLA BRAHMESWARAM WILDLIFE SANCTUARY NOTIFIED UNDER THE WILDLIFE (PROTECTION) ACT, 1972.

[G. O. Ms. No. 44, Environment, Forests, Science & Technology (For.II), 31st May, 2012.]

In exercise of the powers conferred by Section 38 V of the Wildlife (Protection) Act, 1972 (Act 53 of 1972), the Governmet of Andhra Pradesh hereby makes the following Amendments to the notification issued in G.O.Ms.No.50, Environment, Forests, Science & Technology Department, dated: 18.3.2010.

AMENDMENT

In the said notification,-

1. In the Schedule, in the entries at Sl.No.6, for the expression "1194 Sq. Kms" the expression "119,368.46 Hectares" shall be substituted;
2. In the Area Statement Table,-

   a) in column (5), in the Headings, for the expression "Sq.km" the word "Hectares" shall be substituted;

   b) in column (5), in the entries against Sl.No.5, for figure "6,796.00" the figure "6,796.74" shall be substituted.

M. SAMUEL ,
Special Chief Secretary to Government.

4. Name of the Forest Ranges : 1. Velgode
2. Bairluty
3. Gundla Brahmeswaram
4. Gundlakamma
5. Tirumala
6. Dornal

5. Name of the Core / Inviolate area (Critical Wildlife habitat) : Extended Core to Nagarjunasagar Srisailam Tiger Reserve

6. Core / Inviolate area (with in Sanctuary) : 1194 Sq.Km.

AREA STATEMENT

Sl. No.	Name of the District	Name of the Forest Division	Name of the Forest Ranges	Core / Inviolate area in Sq.Km.
1	Kurnool	Atmakur	Velgode	3,053.22
		Atmakur	Bairluty	28,336.00
2	Kurnool	Nandyal	Gundla Brahmeswaram	41,829.00
3	Kurnool	Atmakur	Outside	331.00
4	Prakasam	Giddalur	Gundlakamma	18,864.50
		Giddalur	Tirumala	20,158.00
5	Prakasam	Markapur	Dornal	6,796.00
			TOTAL	**119,368.46**

Boundaries of extended core / Inviolate area to Nagarjunasagar Srisailam Tiger Reserve with in Gundla Brahmeswaram Sanctuary

The boundaries of the Core / Inviolate area for Tiger Conservation as delineated in the map kept in the office of the Principal Chief Conservation of Forests, Andhra Pradesh Hyderabad are as follows:-

North (A to B): The boundary of the Core (GBM Sanctuary) starts from Station "A" noted on the map (permanent masonry pillars bearing sanctuary mark constructed on the ground at a point where the 220 KV line running from Cuddapah to Srisailam crosses the Kurnool Guntur Road (Manthrala Kanuma Road) at a point which is 38 meters east of 85/6 K.M. stone and thence the Northern boundary proceeds in Easternly direction along the said road which also forms the Southern boundary of Nagarjunasagar Srisailam Sanctuary up to Kurnool and Prakasam Districts boundary at Rollapenta (92 K.M. stone) which is again the North-West corner of Cumbum Reserve Forest then the Northern boundary runs along the said road and along the Northern boundary of Cumbum Reserve Forest in Dornal Range upto a point where the samall stream starting from Peddamanti Konda (757) following in Northern direction crosses the said road at the culvert which is 52 meters East of 98/2 K.M. on Kurnool - Guntur road which is marked as Station (B) on the Map.

East (B to C): From station 'B' to Eastern boundary runs along the small stream (including stream) towards its origin Peddamanti Konda (757) and thence follows a cut line joining the Konduru Vagu and along the said vagu will it crosses the Kurupenta Chinna Mantanala Rest House at a Point B1. Thence the Eastern boundary runs along Chinna Mantanala Maddipenta road in South -Westerly direction and Southern direction till it joining the cart track leading from Komativanibhavi at Station B2. Thence along the said cart tract up to Western boundary of Eastern Nallamalai Reserve Forest at Station B3 and along the common boundary of Cumbum Reserve Forest in Southerly and Easterly direction upto south east corner of eastern Nallamalai - 3 Reserve Forest Station B4. Thence the boundary line passes along a cut line touching the peaks 843, 795, 454 and 670 Gunikonda and then follows the line

ANNEXURE-IV

GOVERNMENT OF ANDHRA PRADESH

ABSTRACT

WILDLIFE – Tiger Project – Inclusion of Nagarjunasagar – Srisailam Wildlife Sanctuary during 1982-83 by Government of India – Administration approval – accorded – orders – issued.

FORESTS AND RURAL DEVELOPMENT (FOR.III) DEPARTMENT

G.O.Ms.No.66, **Dated: 25.2.1983**

Read the following:

1. From the Chief Conservator of Forests letter No.76873/82/WL1, dt.1.11.1982.
2. This Government Letter No.63379/For.III/79-19, dated 9.12.1972 addressed to Government of India.
3. From the Chief Conservator of Forests Letters No.76873/76-WLI, dated: 24.1.1983 and 17.2.1983.
4. From the Government of India Letter No.J-11025/18/80-FRY(PT) Dated 16.2.1983.

.. ….. ..

ORDER

The Government of India in their letter fourth read above, have since conveyed their approval to the inclusion of Nagarjunasagar – Srisailam Wildlife Sanctuary under 'Tiger Project' at a total cost of Rs.28.00 lakhs during the sixth Five Year Plan, and at Rs.8 lakhs for 1982-83, on the terms and conditions stipulated in the guidelines enclosed to their letter and treating the Nagarjunasagar-Srisailam Sanctuary as "Tiger Reserve" under the "Centrally sponsored Scheme" on 50:50 cost sharing basis between Central and State Governments (both non-recurring and recurring expenditure).

2. In the circumstances stated above, Government accord sanction for inclusion of Nagarjunasagar-Srisailam Sanctuary as "Tiger Reserve" under Project Tiger of Government of India and also to the incurring of an expenditure of Rs.8.00 lakhs (Rupees eight lakhs only) for implementation of the scheme during 1982-83, of which the Government of India will bear Rs.4 lakhs as their share. The details of the amount of Rs.8.00 lakhs sanctioned are shown in **ANNEXURE** – I to this order.

3. Government also accord sanction for creation of temporary posts as specified in the **ANNEXURE**-II to this order, from the date of appointment till 31.3.1983, under the scheme. The staff sanctioned above shall be eligible to draw usual allowances as admissible under normal rules of State Government and also the special pay as indicated against each post in **ANNEXURE**-II.

4. The expenditure sanctioned shall be debited to "313-Forests -50-Preservation of Wildlife –01-Sanctuaries and "313-Forests-50-Preservation of Wildlife Schemes included in the Plan-U.Centrally sponsored Scheme (01) Sanctuaries".

5. The Chief Conservator of Forests is requested to ensure that various conditions stipulated by Government of India in their Project Guidelines are strictly followed in regard to execution of works, appointment of staff, maintenance of accounts of expenditure, submission of periodical reports on the progress in the implementation of the Project etc.,

6. This order issues with the concurrence of Finance and Planning (Expdr.FRD) Department vide their U.O.No.49306/Expdr.FRD/83-1, dt.8.12.1982.

(BY ORDER AND IN THE NAME OF THE GOVERNOR OF ANDHRA PRADESH)

Sd/-
K. SUBRAMANYAM
SECRETARY TO GOVERNMENT

ANNEXURE-V

Declaration of Nagarjunasagar Srisailam Wildlife Sanctuary under the Wildlife (Protection) Act, 1972 Amendment

(G.O. Ms. No. 233, Energy, Forests, Environment, Science and Technology (For-III), 16th September, 1992)

No. 70

In exercise of the powers conferred by section 18 of the Wildlife (Protection) Act, 1972 (Central Act 53 of 1972), the Governor of Andhra Pradesh hereby issues the following amendment to the Notification issued in **G.O.Ms. No. 485, Forests & Rural Development (For-III) Department, Dated the 5th July, 1978** and published in Andhra Pradesh Gazettee No. 25, Dated 23rd June, 1988.

AMENDMENT

In the said notification for the words "The Nagarjunasagar – Srisailam Wildlife Sanctuary" wherever they occur in the said notification, the words "Rajiv Gandhi Wildlife Sanctuary" shall be substituted.

M. V. NATARAJAN,
Principal Secretary to Government

Part I No. 41, Dated: 08-10-1992 at Page No. 1296. S.84

// true copy //

for Prl. Chief Conservator of Forests,

Block wise, Compartment wise, Enclosure wise areas of Nagarjunasagar Srisailam Tiger Reserve

Compt. No.	Area (Km^2)
DIST: Mahabubnagar DIVN: Achampet BLOCK: Amrabad	
1	3.99
2	0.79
3	1.83
4	2.46
5	0.99
6	3.93

Compt. No.	Area (Km^2)
7	0.86
8	3.65
9	5.72
10	3.13
11	2.38
12	2.68
13	1.39
14	4.32
15	3.09
16	2.45
17	2.45
18	1.90

Compt. No.	Area (Km^2)
19	4.95
20	1.63
21	3.04
22	1.38
23	0.61
24	3.12
25	3.26
26	1.81
30	2.82
31	2.96
32	3.57
33	1.43

Compt. No.	Area (Km^2)
34	3.09
35	2.69
36	2.19
37	4.67
38	3.41
39	1.46
40	8.59
41	1.35
42	2.66
43	3.99
44	3.86
45	2.60

Compt. No.	Area (Km^2)	Compt. No.	Area (Km^2)	Compt. No.	Area (Km^2)	Compt. No.	Area (Km^2)
46	3.28	104	9.37	150	9.83	196	6.34
47	5.45	105	11.44	151	14.70	197	6.14
48	6.85	106	9.08	152	9.13	198	16.40
49	3.98	107	5.43	153	5.49	199	3.30
50	3.37	108	2.14	154	7.50	200	13.73
51	2.53	109	2.40	155	7.54	201	3.64
52	5.65	110	5.36	156	2.39	202	7.68
53	4.50	111	6.09	157	3.23	203	3.10
54	2.29	112	1.12	158	7.69	204	8.11
55	4.34	113	1.84	159	3.53	205	5.12
56	5.44	114	3.40	160	7.07	206	3.34
57	4.06	115	5.11	161	4.61	207	1.38
58	5.20	116	5.18	162	2.73	208	2.06
59	2.99	117	4.46	163	3.87	209	1.62
60	3.60	118	1.99	164	8.29	210	3.75
61	1.30	119	3.91	165	9.97	211	3.24
62	5.32	120	4.00	166	15.45	212	1.71
63	2.35	121	10.61	167	8.56	213	2.05
64	3.89	122	10.66	168	11.47	214	1.34
65	6.23	123	4.65	169	8.07	215	1.36
78	4.56	124	4.30	170	4.36	216	5.23
79	4.53	125	3.69	171	2.46	217	2.96
80	4.61	126	10.92	172	6.38	218	2.48
81	4.72	127	15.61	173	4.20	219	5.97
82	8.83	128	6.77	174	4.14	220	12.16
83	4.27	129	6.88	175	6.92	221	4.04
84	8.61	130	11.17	176	10.44	222	4.57
85	3.86	131	1.51	177	3.16	223	7.17
86	6.25	132	2.24	178	2.04	224	5.81
87	3.29	133	1.92	179	1.76	225	2.72
88	3.32	134	6.15	180	3.68	226	3.49
89	4.54	135	12.48	181	2.55	227	8.00
90	13.27	136	5.31	182	2.66	228	4.94
91	7.07	137	4.03	183	4.11	239	11.78
92	4.09	138	7.74	184	2.20	240	1.69
93	2.50	139	5.61	185	1.89	241	13.34
94	4.69	140	19.41	186	8.40	242	3.81
95	2.72	141	15.40	187	18.03	243	2.68
96	3.58	142	2.97	188	6.33	244	1.16
97	3.65	143	4.53	189	2.54	245	16.26
98	12.29	144	6.39	190	1.88	246	0.64
99	2.36	145	10.89	191	7.22	247	1.72
100	4.82	146	4.45	192	4.51	248	9.08
101	7.26	147	5.45	193	3.43	249	2.01
102	4.91	148	12.40	194	3.92	250	14.63
103	4.05	149	11.43	195	7.38	251	5.80

Compt. No.	Area (Km²)
252	4.72
253	2.07
254	1.49
255	7.85
256	3.83
257	2.26
258	7.44
259	2.57
260	2.42
261	2.35
262	2.01
263	5.11
264	2.27
265	3.07
266	3.38
267	2.45
268	1.91
269	2.38
270	7.42
271	3.27
272	3.51
273	6.94
274	6.48
275	9.48
276	5.07
277	1.78
278	4.11
279	5.36
280	2.01
281	4.30
282	2.30
283	2.15
284	2.33
285	2.51
286	7.05
287	2.02

Compt. No.	Area (Km²)
288	2.19
289	8.07
290	2.01
291	4.66
292	7.49
293	3.35
294	6.45
295	5.40
296	5.52
297	2.48
298	10.74
299	1.88
300	1.46
301	7.83
302	2.17
303	11.82
304	2.10
305	7.62
306	5.49
307	6.32
308	6.72
309	12.01
310	10.15
311	5.80
312	3.55
313	3.17
314	2.30
315	0.87
316	2.77
317	0.84
318	1.78
319	1.24
320	1.49
321	1.29
322	1.31
323	2.09

Compt. No.	Area (Km²)
324	1.34
325	0.99
326	3.84
327	0.83
328	0.80
329	4.19
330	0.61
331	5.32
332	3.61
333	4.96
334	3.03
335	3.38
336	6.57
337	3.64
338	5.05
339	2.87
340	1.76
341	2.84
342	3.29
343	1.73
344	10.99
345	5.45
346	4.41
347	4.29
348	3.78
349	12.15
350	3.10
351	4.91
352	17.42
353	7.63
354	8.75
355	8.93
356	8.44
357	2.58
358	8.60
359	7.30

Compt. No.	Area (Km²)
360	2.14
361	10.68
362	2.38
363	15.66
364	12.33
365	5.10
366	3.26
367	4.39
368	3.00
369	6.94
370	8.74
371	2.72
372	1.46
373	11.26
374	2.35
375	1.14
376	4.39
377	1.66
378	2.46
379	4.80
380	4.58
381	8.81
382	4.15
383	3.11
384	2.43
385	4.38
386	13.03
480	2.39
LINGALA I	
478	2.72
479	5.93

Compt. No.	Area (Km²)
DIST: Kurnool DIVN: Atmakur BLOCK/RF: Guvvalakuntla C	
748	4.45
749	4.82

Compt. No.	Area (Km²)
750	2.76
BLOCK/RF: Nandikotkur	
751	5.69
752	2.88
753	4.03
754	3.91

Compt. No.	Area (Km²)
755	6.18
756	2.75
757	5.61
758	7.22
759	6.13
760	4.87
761	6.95

Compt. No.	Area (Km²)
762	6.16
763	4.06
764	4.28
765	5.26
766	4.31
767	3.50
768	8.13

Compt. No.	Area (Km²)
769	3.59
BLOCK/RF: Nandikotkur (A)	
770	2.22
BLOCK/RF: Nandikotkur	
770	5.97
771	4.80
772	3.86
773	5.15
774	2.96
BLOCK/RF: Guvvalakuntla C	
832	3.44
836	4.36
837	4.64
838	2.24
BLOCK/RF: Nandikotkur	
839	5.66
840	6.34
841	5.03
842	4.17
843	3.37
844	8.27

Compt. No.	Area (Km²)
845	6.01
846	5.06
847	3.60
848	5.74
849	3.65
850	6.86
851	5.78
852	7.49
853	6.16
854	6.13
855	2.57
856	2.08
857	3.60
858	5.78
859	6.81
860	3.85
861	3.58
862	4.23
863	7.95
864	4.22
865	1.53
866	6.66
867	1.09
868	5.31
869	5.27

Compt. No.	Area (Km²)
870	4.65
871	5.19
872	4.14
873	5.13
874	5.71
875	4.67
876	3.11
877	3.93
878	5.84
879	5.86
880	5.29
881	7.05
882	4.54
883	3.21
884	3.89
885	5.37
886	4.58
887	5.15
888	1.81
889	5.97
890	4.69
891	3.29
892	4.74
893	4.10
894	2.34

Compt. No.	Area (Km²)
895	2.84
896	7.28
897	4.60
898	6.97
899	3.95
900	4.87
901	6.94
902	5.03
903	1.18
904	5.00
905	4.17
906	5.91
907	2.97
908	3.92
909	4.58
910	5.64
911	5.19
912	2.60
913	6.35

Compt. No.	Area (Km²)
DIST: Prakasam DIVN: Markapur BLOCK: E.N. BLOCK IX	
146	5.35
147	3.06
BLOCK: E.N. BLOCK VII	
68	2.86
69	3.76
87	1.86
90	2.46
91	2.42
125	2.89
126	3.66
BLOCK:	

Compt. No.	Area (Km²)
Markapur	
14	5.60
15	6.18
16	6.00
17	4.85
18	4.98
20	4.01
21	2.83
22	5.84
23	1.39
24	4.30
25	3.80
26	5.34
27	3.70
28	2.88
29	4.20
30	4.01

Compt. No.	Area (Km²)
31	2.50
32	4.12
64	2.97
65	3.27
66	2.29
70	4.44
71	4.13
72	5.38
73	3.82
74	3.18
75	3.96
76	4.05
77	3.60
78	2.18
79	4.84
80	4.66
81	3.84

Compt. No.	Area (Km²)
82	5.10
83	3.67
84	3.87
85	4.83
86	2.35
87	2.77
88	2.70
89	2.37
92	3.08
93	5.98
94	4.95
95	6.35
96	3.75
97	3.87
98	3.95
99	5.06
100	9.02

Compt. No.	Area (Km²)
101	4.08
102	7.25
103	5.16
104	8.86
105	4.54
106	5.50
107	3.65
108	5.98
109	6.21
110	4.18
111	5.47
112	3.95
113	5.39

Compt. No.	Area (Km²)
114	5.06
115	8.75
116	4.62
117	4.64
118	8.50
119	7.47
120	8.52
121	8.97
122	4.39
123	4.33
124	5.46
127	6.97
128	5.20

Compt. No.	Area (Km²)
129	8.70
130	8.07
131	4.89
132	7.19
133	6.10
134	4.44
135	4.63
136	4.46
137	5.88
138	5.52
139	7.24
140	7.74
141	7.15

Compt. No.	Area (Km²)
142	5.48
143	4.46
144	4.94
145	6.11
149	4.89
364	73.36
365	58.32
366	71.71
367	44.95
368	77.26
369	53.97
370	84.75
371	81.66

Compt. No.	Area (Km²)
DIST: Prakasam DIVN: Markapur BLOCK: E.N. BLOCK IX	
146	5.35
147	3.06
BLOCK: E.N. BLOCK VII	
68	2.86
69	3.76
87	1.86
90	2.46
91	2.42
125	2.89
126	3.66
BLOCK: Markapur	
14	5.60
15	6.18
16	6.00
17	4.85
18	4.98
20	4.01
21	2.83
22	5.84
23	1.39
24	4.30
25	3.80
26	5.34

Compt. No.	Area (Km²)
27	3.70
28	2.88
29	4.20
30	4.01
31	2.50
32	4.12
64	2.97
65	3.27
66	2.29
70	4.44
71	4.13
72	5.38
73	3.82
74	3.18
75	3.96
76	4.05
77	3.60
78	2.18
79	4.84
80	4.66
81	3.84
82	5.10
83	3.67
84	3.87
85	4.83
86	2.35
87	2.77
88	2.70
89	2.37
92	3.08

Compt. No.	Area (Km²)
93	5.98
94	4.95
95	6.35
96	3.75
97	3.87
98	3.95
99	5.06
100	9.02
101	4.08
102	7.25
103	5.16
104	8.86
105	4.54
106	5.50
107	3.65
108	5.98
109	6.21
110	4.18
111	5.47
112	3.95
113	5.39
114	5.06
115	8.75
116	4.62
117	4.64
118	8.50
119	7.47
120	8.52
121	8.97
122	4.39

Compt. No.	Area (Km²)
123	4.33
124	5.46
127	6.97
128	5.20
129	8.70
130	8.07
131	4.89
132	7.19
133	6.10
134	4.44
135	4.63
136	4.46
137	5.88
138	5.52
139	7.24
140	7.74
141	7.15
142	5.48
143	4.46
144	4.94
145	6.11
149	4.89
364	73.36
365	58.32
366	71.71
367	44.95
368	77.26
369	53.97
370	84.75
371	81.66

Enclosures	Area Km²
DIST: KURNOOL DIVN: ATMAKUR	
Nandikotkur R.F.	
1. Srisailam Temple	18.65
2. Srisailam Project Colony	5.94
3. Varadarajaswamy Gudi Project	1.60
DIST: PRAKASHAM DIVN: MARKAPUR	
Markapur R.F.	
3. Devaluti (Bommalapuram)	0.08
Eastern Nallamalai Block-9 RF	
4. Chennupall	0.67
5. Venkatadripalem	0.79
DIST: GUNTUR DIVN: N. SAGAR	
Kandlagunta Extension - 2 RF	
6. Morasapenta	2.33
Kandlagunta R.F.	
7. Kothapullareddipuram	7.77
8. Akkalaram	7.61
9. Achammakunta	2.48
10. Latchammabavi part	0.68
Pasuvemula R.F.	
11. Pasuvemula left of Ethipothala	2.90
12. Vijayapuri South	12.56
13. Ekunampet	1.87
14. Damerapadu	4.75
Tummerkota R.F.	
15. Tummerkota	2.57
DIST: NALGONDA DIVN.: N. SAGAR	
Nidgul R.F.	
16. Chitrial	12.37
17. Rekalgadda	1.68
18. Kambalpalli	15.00
19. Dasarlapalli	0.68
20. Rekularam	0.75
21. Gandhinagar	12.50
22. Narayanpet	14.93
23. Pogulla	5.18
24. Yellamanda	2.62
5. Bollaram	3.43
26. Ganugu	0.25
Nellikal R.F.	
27. Vijayapuri North (hill colony)	7.12
DIST: MAHABOOBNAGAR DIVN: ACHAMPET	
Amarabad R.F.	
28. Udmilla	6.58
29. Ippalapalli-Maredugu	32.38
30. Maddimadugu	2.18
31. Chama thota	
32. Nallajama	
33. Vatvarlapalli	3.75
34. Egalapenta - Domalapenta	2.23
Enclosure Area:	**196.88**
Krishna River Area:	**294.65**
TOTAL N.S.T.R AREA:	**4531.69**

ANNEXURE-VI

GOVERNMENT OF ANDHRA PRADESH
FOREST DEPARTMENT

Wildlife - Notification of Rajiv Gandhi Wildlife Sanctuary under Section 26-A of Wildlife (P) Act., 1972 - Notification - issued.

Environment Forests Science & Technology (For-III) Department

GOMS No. 84 — Dated: 27th June- 1998.

Read the following

G.O.M.S. No 485, EFS &T (For III) Department dated 05/07/1978. From the Principal Chief Conservator of Forest Ref. No. 8533/98-WL1, Dt. 15/04/1998.

* * *

The appended Notification will be published in an extraordinary issue of the Andhra Pradesh Gazette.

2) The Director, Printing, Stationery and stores purchase Department is requested to supply 200 copies of the printed Gazette notification to the Prl. Chief Conservator of Forests, Andhra Pradesh, Hyderabad and (50) copies to the government.

3) The Collectors Kurnool, Guntur, Prakasam, Mahaboobnagar and Nalgonda Districts is requested to republish the Notification in their District Gazette and take necessary further action under Chapter - IV of the Wildlife (Protection) Act, 1972.

(BY ORDER AND IN THE NAME OF THE GOVERNOR OF ANDHRA PRADESH)

Sd/- C.S. RANGACHARI,
SPECIAL CHIEF SECRETARY TO GOVERNMENT

NOTIFICATION

In exercise of the powers conferred by Section 26-A of the Wildlife (Protection) Act, 1972 (Central Act No 53 of 1972) the Governor of Andhra Pradesh hereby declares the areas specified in the Schedule to be a Wildlife Sanctuary which shall be called "Rajiv Gandhi Wildlife Sanctuary (Nagarjunasagar Srisailam Wildlife Sanctuary)".

2. The notification shall come into force with effect from the date of Publication of the Notification in Andhra Pradesh Gazette.

THE SCHEDULE

Name of the Districts	:	1) Mahaboob Nagar 2) Nalgonda 3) Guntur 4) Prakasam 5) Kurnool.
Names of the Forest Division	:	1) Achampet 2) Nalgonda 3) Guntur 4) Markapur 5) Atmakur.
Name of the Taluks	:	1) Achampet 2) Devarkonda 3) Miryalaguda 4) Macherla 5) Y. Palem. 6) Atmakur.
Name of the Forest Ranges	:	1) Amarabad 2) Mannanur 3) Devarakonda 4) Miryalaguda 5) Macherla 6) Gunjivaripalli 7) Yerragondapalem 8) Pecheruvu.
Name of the Sanctuary	:	Rajiv Gandhi Wildlife Sanctuary (Nagarjunasagar-Srisailam Wildlife Sanctuary)
Area of the Sanctuary	:	3,56,809.00 ha.

THE SCHEDULE

Sl No	Name of the District	Name of the Forest Division	Name of the Taluks	Name of the Forest Ranges	Area of the Sanctuary in Ha.
1.	Mahaboob-nagar	Achampet	Achampet	i) Amarabad ii) Mannanur	1,75,000
2.	Nalgonda	Nalgonda	Devarkonda Miryalaguda	i) Devarkonda ii) Miryalaguda	41,637
3.	Guntur	Guntur	Macherla	Macherla	32,554
4.	Prakasam	Markapur	Y.Palem	i) Gaunjivaripalli ii)Yerragondapalem	66,518
5.	Kurnool	Atmakur	Atmakur	i) Pecheruvu	41,100

Boundaries of the Sanctuary:

The boundaries of the Sanctuary as delineated in the map kept in the office of the Chief Conservator of Forests are as follows.

North (A-B): The boundary of the sanctuary starts from the station "A" denoted on the map (permanent masonry pillars bearing sanctuary mark constructed on the ground) which is North-West corner of the Forest Block Nidgul in Nalgonda Forest Division and it runs in easterly direction in a zig-zag manner along the Northern boundary of Nidgul Reserve Forest upto a point fixed with permanent masonry pillar bearing sanctuary mark constructed on the ground where the Reserve Forests boundary touches the maximum flood level of 179 M. of Nagarjunasagar Reservoir near the food of the hillock 341M thence along the said M.F.L. in Northerly and Westerly direction in zig-zag manner to the confluence of Peddavagu with Nagarjunasagar; then it crosses Peddavagu and runs along the said M.F.L line to a point (Permanent Masonry pillar bearing sanctuary mark constructed on the ground) where it comes close in the southern boundary of Suryaraopet Reserve Forests after passing Suryaraopet village; thence along the western boundary of the said Reserve Forests in a general northern, Eastern and Southern directions passing the villages of Suryaraopet, Kannapur, Puttamgondi Tanda, Chingum and Kadutanda to a point where the eastern boundary in the said Reserve Forests comes close to the M.F.L of Nagarjunasagar and where a small streamlet also joins Nagarjunasagar. Then the line runs along the M.F.L of Nagarjunasagar in general northern and southern directions to a pint where the said M.F.L. line comes close to western boundary of Rayaram Reserve Forests; at the foot of the hill 248' lying in the said Rayaram Reserve Forests; thence towards general north and east and other directions along the Rayaram Reserve Forests boundary till it meets the M.F.L. line of Nagarjunasagar. Then it runs along the said M.F.L. line of Nagarjunasagar in a general west, north, east and southern directions till it meets Nelikal Reserve Forests boundary towards west and other directions in a zig-zag manner and crossing state highway from Hyderabad to Vijayapuri North and running along the Northern, eastern and southern boundaries of Nellikal Reserve Forests upto a point where the southern boundary of the said Reserve Forests touches th limits of the northern bank of River Krishna, then the

boundary runs along the said river bank, limits towards general easterly direction upto a masonry pillar with sanctuary mark constructed at the bi-junction point of the limits of the western bank of Hallia River upto a point where the extreme north east corner of Rajavaram village touches the western bank of Hallia River. Thus it crosses the Hallia river and meets the point 'B' which is a masonry pillar with sanctuary mark constructed for the purpose.

East (B-C): Thence the boundary runs along the eastern bank of river Hallia upto the River Krishna. then it crosses the River Krishna and meets the masonry pillar with sanctuary mark constructed on the limits of the southern bank of the said river where the foot path-cart track going to Mallavaram (V) crosses the limits of the said southern bank of Krishna River.

Then the boundary runs along the said river Bank limits towards west till it meets the boundary of Tummurukota Reserve Forests; thence along the eastern and southern boundaries of Tummurukota Reserve Forests and crosses.

Chandravanka River at Ethipothala Water falls. Thence it follows the southern boundary of Pasuvemula Reserve Forests and crosses the state highway leading to Vijayapuri South. then it turns towards general northerly direction and runs along the said Reserve Forests boundary till it meets the Public Works Department limits of the southern bank of River Krishna; thence along the said Public Works Department limits of southern bank of River Krishna, it runs towards wet upto a point (at sluice) on the southern bank of Nagarjunasagar Right Bank Canal or Jawahar Canal; thence along the Nagarjunasagar limits till the later touches the northern boundary of the Pasuvemula Reserve Forests bit abutting the Nagarjunasagar. A masonry pillar with sanctuary mark is constructed at the bi-junction of the limits of Nagarjunasagar and Pasuvemula Reserve Forests. Thence towards south, east and general southerly direction along the Northern and Eastern boundaries of Pasuvemula Reserve Forest (Portion) till it meets the boundary of Kadlagunta Reserve Forests till it meets Jarrivagu thence crossing Jarrivagu the boundary runs along the common boundary of Gangulagunta and Muthukur Reserve Forests till the said common Reserve Forests boundary meets the common boundary of Guntur and Prakasam Districts at the tri-junction point of Gangalagunta Reserve Forests, Muthukur Reserve Forests of Guntur District and Markapur Reserve Forests of Prakasam District (Markapur Division), which is pint 'C' denoted on the map.

South(C-D): Then the boundary of the sanctuary runs along the Chinavaram vagu flowing in a general southernly direction on the eastern side of Carnipanta (v) through Markapur Reserve Forest s in Prakasam district upto the point where the said foot-paths from Naratadikulapenta to Garripenta to Venkatadripalem(v) then it follows the said foot-path running through the Markapur Reserve Forests towards Venkatadripalem (v) till it meets the said Reserve Forests boundary thence towards west south and westerly and other directions along the boundary of the said Markapur Reserve Forests enclosing within the sanctuary the entire areas of (i) Eastern Nallamalai Block of (Venkatadripalem) Reserve Forests and (ii) Eastern Nallamalai Block No.IX (Kollurgula) Reserve Forests to it meets the quadri-junction point of the boundaries of Nandikotkur Reserve Forests, Markapur Reserve Forests, Cumbam Reserve Forests and Nandyal Reserve Forests at Rollapenta (v) (vide C1 in the map).

Then the boundary runs along the common Reserve Forests boundary of Nandikotkur and Nandyal reserve Forests towards west to the trijunction point of the boundaries of Guvvalagunta Reserve Forests Block 'C' Nandikotkur Resergve Forests and Nandyal Reserve Forests at Bairluti gudem (v) of Atmakur taluk. Then it runs along the common reserve Forests boundary of Nandikotkur Reserve Forests and Guvvalakunta Reserve Forests Block 'C' and thereafter over a short distance along boundary of Nandikotkur Reserve Forests upto a point where the foot-path from Guvvadagunta - Chintal Banda - Nudemamudapenta to Regulapayapenta crosses the said reserve Forests boundary marked 'D' in the map.

West (D-A): Then it runs along the said foot-path to the southern limits of the river Krishna near Regulapayapenta; thence along the said southern limits of River Krishna over a distance of about 3 kms. upto a point on the said river bank where a masonry pillar bearing sanctuary mark is constructed. The masonry pillar will be facing the confluence of Yemalapayavagu on Patmakolevagu (on the northern said) wth river Krishna. Then the boundary crosses the River Krishna and meets a masonry pillar bearing sanctuary mark constructed on the western park of Yemalapaya vagu. then it runs along the said vagu and the western boundary of Amarabad Reserve Forests of Achampet Division passing village lingal, billakal, Banal etc., upto a point where the southern limits of the state high way from Hyderabad to Srisailam Crosses the said Reserve Forests line south-east of Rangapur (v) and then the line crosses the highway and runs along the Reserve Forests line to northern direction upto the foot-path from Amarabad to Bommampalli and the line runs along this foot-path in southerly direction and joins the Amarabad enclosure line and then takes a right-turn and return south-westerly direction along the enclosure line and crosses the foot-path Macharam - Ainole and State highway - Hyderabad - Srisailam and then runs southerly and other directions along the said enclosure line passing Mannanur, Amarabad. Tirumaiapur, Laxmapur, Chtlankunta villages' upto a point where the foot-path from Venkeswaram to Gonepur village crosses the said enclosure line. Then it runs along the said Amarabad Reserve Forest boundary towards south along the eastern limits of said foot-path till it crosses the Amarabad Reserve Forests external boundary. Then it runs and other directions upto a point where the Reserve Forests boundary touches the Dindi River near Bakalingalapalli (v). Then it runs along the western southern bank of River Dindi over a distance of 15 (fifteen) Kms. to a point where masonry pillar, bearing sanctuary mark is constructed. Then it crosses the said river and meets the bi-junction of Nidgal Reserve Forests boundary and the northern bank Dindi river on the southern side of the hillock 1115'. Then it runs along the said Reserve Forests boundary towards north and other directions to meet the starting point 'A'. Besides the area specified above the following Reserve forests also shall be within this sanctuary.

1. Rajavaram R.F - Nalgonda District
2. Azampur - Nalgonda District

N.B:- All the enclosure within the Reserve Forests and villages and private lands covered in the above specified limits shall stand included for the purpose of the notification.

S. No	Name of the Reserve Forest	Area in ha	Tot. Area
1	Nidgul	30,140.00	
2.	Azampur	342.00	
3.	Suryaraopet	1,077.00	
4.	Rayaram	3,730.00	
5.	Nellikal	3,182.00	
6.	Rajawaram	3,166.00	41,637.00
7.	Tummurkota (Block No.II, III & IV)	277.00	
8.	Pasevemula	5397.00	
9.	Kadla Gunta	19,135.00	
10.	Gangala Gunta	7,745.00	32,554.00
11.	Markapur (Part)	64,574.00	
12.	Eastern Nallamala Block VIII	884.00	
13.	-do- Block IX	1,060.00	66,518.00
14	Nandikotkur R.F.(part)	41,100.00	41,100.00
15.	Amarabad R.F.(Part)	1,75,000.00	1,75,000.00
	TOTAL		**3,56,809.00**

The Field Director (Project Tiger) Srisailam who is authorized to perform the functions of the District Collector vide G.O.M.S. No 39 EFS & T(for III) Department, dated 17/4/1997 has determined the existence, the Nature and the extent of the rights of the persons in the Rajiv Gandhi Wildlife Sanctuary (Nagarjunasagar - Srisailam Tiger Reserve) vide his proceeding No 5039/96/PT8 dated 2/4/1998, is as follows.

1. The local communities are entitled to the rights and concessions as admitted at the time of settlement of Forest Blocks.

Sd/- C.S. RANGA CHARI,
Spl., Chief Secretary to Government

ANNEXURE-VII

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THE ANDHRA PRADESH GAZETTE

PART–I EXTRAORDINARY
PUBLISHED BY AUTHORITY

No. 711] HYDERABAD, THURSDAY, DECEMBER 20, 2007.

NOTIFICATIONS BY GOVERNMENT

ENVIRONMENT, FORESTS, SCIENCE & TECHNOLOGY DEPARTMENT

(*For. II*)

NAGARJUNASAGAR SRISAILAM TIGER RESERVE (NSTR) – NOTIFYING OF INVIOLATIVE AREA / SPACE FOR CONSERVATION OF TIGER RESERVE / SANCTUARY.

[G.O. Ms. No. 148, Environment, Forests, Science & Technology (For. II), 20th December, 2007.]

In exercise of the powers conferred by Section 38V of the Wildlife (Protection) Act, 1972 (Central Act NO.53 of 1972) and amendment Act, 2006 (No.39 of 2006) the Government of Andhra Pradesh hereby declares the areas specified in the schedule to be a inviolate area (critical tiger habitat) for the purpose of Tiger Conservation, which shall be called as inviolate area / space of "Nagarjunasagar – Srisailam Tiger Reserve" with in the limits of the Rajiv Gandhi Wildlife Sanctuary.

2. The Notification shall come into force with effect from the date of Publication of Notification in Andhra Pradesh Gazette.

[1]

G-1017

THE SCHEDULE

Names of the Districts	:	1) Mahaboobnagar 2) Guntur 3) Prakasam 4) Kurnool
Names of the Forest Divisions	:	1) Achampet 2) N.Sagar 3) Markapur 4) Atmakur
Names of the Mandals	:	1) Amrabad 2) Macherla 3) Veldurthy 4) Y.Palem 5) Dornala 6) Atmakur 7) Srisailam
Names of the Forest Ranges	:	1) Achampet 2) Amrabad 3) Mannanur 4) V.P South 5) Gangivaripalli 6) Yerragondapalem 7) Dornala 8) Nagaluty 9) Atmakur 10) Srisailam
Name of the inviolate area (critical tiger habitat)	:	Nagarjunasagar – Srisailam Tiger Reserve inviolate area (NSTR-I)
Inviolate area for Tiger Conservation (with in Tiger Reserve / Sanctuary)	:	2527 Sqkm (as per Compt. areas)

THE SCHEDULE

Sl. No.	Name of the District	Name of the Forest Division	Name of the Forest Ranges	Inviolate area in SqKm
1	Mahaboobnagar	Achampet	i) Achampet	4.80
			ii) Amrabad	397.51
			iii) Mannanur	874.23
2	Guntur	N.Sagar	i) V.P South	100.66
4	Prakasam	Markapur	i) Y.Palem	71.30
			ii) Dornala	127.10
			iii) Ganjivaripally	609.06
5	Kurnool	Atmakur	i) Nagaluty	41.07
			ii) Atmakur	99.38
			iii) Srisailam	201.89
			Total	**2527.00**

Boundaries of the Inviolate area (critical tiger habitat) within the Tiger Reserve / Sanctuary

The boundaries of the inviolate area for Tiger Conservation as delineated in the map kept in the office of the Principal Chief Conservator of Forests, Andhra Pradesh, Hyderabad are as follows:-

North (A to B) :- The boundary of inviolate area for Tiger Conservation starts from the station A, denoted on the map (North-West corner of Compartment No.161 in Amrabad RF of Wildlife Management, Achampet Division) runs easternly direction along northern boundary of Compartment Nos.161, 162, 155 and then runs towards southernly direction along eastern boundary of Compartment Nos.155, 154, 165, 166, 167, 168 & 169 in Amrabad RF of Wildlife Management, Achampet Division. Then the line runs eastern direction, along outer boundary of Compartment Nos.150 & 149 (Northern boundary of said compartments), and then the line runs towards northernly direction and thence westerly direction, along the boundary of Compartment No.140, and reached to Northern corner of Compartment No.139. Then the line runs easternly direction, along northern boundaries of compartment Nos.139, 138, 125, 122, 106 and to North-West corner of

Compartment No.105, and thence northernly direction in zig-zag manner, along western boundary of compartment Nos.104, 103, 102, 112 then the line runs Easternly direction in zig-zag manner along with outer boundaries (Northern boundary) of Compartment Nos.113, 114 and then runs towards North-East direction and along north west boundaries of Compartment No.114, 100 and thence northerly direction along western boundary of Compartment No.73, then easternly direction along Northern boundaries of Compartment Nos.73 & 70, then southern direction in zig-zag manner along eastern boundary of Compartment No.70 and meets to point 'B'.

East (B to C) :- Thence the boundary runs from point B to C towards south-west direction in zig-zag manner along with outer boundaries of Compartment Nos.69, 68, 67, 66 of N.Sagar Division (Eastern boundary of said Compartment Nos), and thence runs southernly & westernly direction along south west boundaries of Compartment Nos.369, 138, 141, 142, 119, 104 & 105 (East and west boundaries of said Compartment Nos) and meets to point 'C' (South west corner of Compartment No.105 in Markapur RF Wildlife Management, Markapur Division.

South (C to D):- Then boundary of inviolate area for Tiger Conservation runs South-west direction in zig-zag manner along the boundary of Compartment Nos.106, 107, 108, 79, 74, 76, 29, 26 in Markapur RF of Wildlife Management, Markapur Division (along South-East boundary of said compartments), and crosses district boundary of Prakasam and Kurnool District and thence the line runs towards westernly direction in zig-zag manner, along outer boundaries of Compartment No.770, 762, 870, 871, 872, 873, 852, 853, 854, 844, 843, 836 in Nandikotkur RF Wildlife Management, Atmakur Division (Southern boundary of said compartment Nos), and meets point D as denoted on the map. (Western corner of compartment No.836 in Nandikotkur RF of Wildlife Management, Atmakur Division).

ANNEXURE-VIII

MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

NOTIFICATION

New Delhi, the 18th October, 2021

S.O. 4373(E).—WHEREAS, a draft notification was published in the Gazette of India, Extraordinary, *vide* notification of the Government of India in the Ministry of Environment, Forest and Climate Change number S.O.653 (E), dated the 11th February, 2020, inviting objections and suggestions from all persons likely to be affected thereby within a period of sixty days from the date on which copies of the Gazette containing the said notification were made available to the public;

AND WHEREAS, copies of the Gazette containing the said draft notification were made available to the public on the 11th February, 2020;

AND WHEREAS, no objections and suggestions were received from persons and stakeholders in response to the draft notification;

AND WHEREAS, Nagarjunasagar Srisailam Tiger Reserve (NSTR) is located in the Nallamara hill ranges (offshoot of Eastern Ghats) of Andhra Pradesh. The total area of the Tiger Reserve with core and buffer is 3727.82 square kilometres spread over Prakasam, Kurnool and Guntur Districts of Andhra Pradesh. The Tiger Reserve is constituted by two Wildlife Sanctuaries namely, Rajiv Gandhi Wildlife Sanctuary and Gundla Brahmeswaram Wildlife Sanctuary (GBM). After State bifurcation, Nagarjunasagar Srisailam Tiger Reserve has also been divided into two halves separated by river Krishna. The southern side of river is Nagarjunasagar Srisailam Tiger Reserve in Andhra Pradesh and the northern side is Amrabad Tiger Reserve in Telangana State. The Eco-sensitive Zone in this notification is in respect of the Nagarjunasagar Srisailam Tiger Reserve of Andhra Pradesh;

AND WHEREAS, Nagarjunasagar Srisailam Tiger Reserve, in the Nallamara ranges of southern Eastern Ghats in Andhra Pradesh is an abode for biodiversity, endangered flora and its associated fauna. This Tiger Reserve epitomises typical physical and biological features of Deccan plateau (6D, 6E). Most of the Tiger Reserve is hilly with plateaus, ridges, gorges and deep valleys which support tropical mixed dry deciduous forests with an under growth of bamboo and grass. Two Sanctuaries *viz,* Rajiv Gandhi Wildlife Sanctuary and Gundla Brahmeswaram Sanctuary form the Tiger Reserve. The final notification has been issued for Rajiv Gandhi Wildlife Sanctuary under section 26A of the Wildlife (Protection) Act, 1972 *vide* G.O. Ms. No. 84 EFS&T (For-III) dept., dated the 27th June, 1998. The final notification for Gundla Brahmeswaram Wildlife Sanctuary was issued under section 26A of the Wildlife (Protection) Act, 1972 *vide* G.O.Ms. No.81, EFS&T (For-III), dated the 27th June, 1998;

AND WHEREAS, Nagarjunasagar Srisailam Tiger Reserve epitomises a typical Deccan Plateau (6D, 6E) species of flora and fauna. The Sanctuaries are characterised by hilly terrain with plateaus, ridges, gorges and deep valleys which support tropical mixed dry deciduous and moist deciduous forests with an under growth of bamboo and grass. The protected area is endowed with a rich floral diversity comprising of trees, shrubs, herbs and climbers. Around 1521 angiosperm taxa of 149 families and 29 species of grass along with 353 species of medicinal plants have been documented. The most predominant trees found here are *Terminalia tomentosa, Anogeissus latifolia, Chloroxylon swietenia, Hardwickia binata, Pterocarpus marsupium, Lannea grandis, Boswellia serrata, Dalbergia paniculata, Zizyphus xylopyrus, Lagerstroemia parviflora, Terminalia arjuna,* etc. There are certain endemic plants found only in Nallamalais like *Andrographis nallamalayana, Eriolaena lushingtonii, Crotalaria madurensis* var. kurnoolia*, Dicliptera beddomei* and *Premna hamiltonii,* etc;

AND WHEREAS, Rajiv Gandhi Wildlife Sanctuary and Gundla Brahmeswaram Wildlife Sanctuary support a wide variety of animals, birds, insects, reptiles and amphibians. The protected areas are the home to many charismatic animals like tiger (*Panthera tigris*), leopard (*Panthera pardus*), sloth bear (*Melursus ursinus*), wild dog (*Cuon alpinus*), jackal (*Canis aureus*), ratel (*Mellivora capensis*), porcupine (*Hystrix* sp.), giant squirrel (*Ratufa indica*), mouse deer (*Moschiola* sp.), four horned antelope (*Tetracerus quadricornis*), sambar (*Rusa unicolor*), spotted deer (*Axis axis*), nilgai (*Boselaphus tragocamelus*) and wild boar (*Sus scrofa*). The faunal species documented in this Tiger Reserve are 50 species of mammal, 200 species of birds, 54 species of reptiles, 18 species of amphibians, 5 species of fishes, 84 species of butterflies, 57 species of moths, 45 species of coleopteran beetles, 30 species of damselflies, etc. The presence of wide variety of animals, birds, reptiles, amphibians, insects in the Tiger Reserve is a testimony to the bio-diversity of this landscape;

AND WHEREAS, Nagarjunasagar Srisailam Tiger Reserve is a repository of biodiversity with varied flora and fauna in Deccan plateau of peninsular India. The topography of the Tiger Reserve enables the occurrence of varied micro and macro habitats to shelter variety of wild animals;

AND WHEREAS, the National Board for Wildlife has taken decision for declaration of Eco-sensitive Zones around National Parks and Wildlife Sanctuaries. The Government of Andhra Pradesh have issued instructions to identify Eco-sensitive Zones around the protected areas in consultation with the line Departments under the Chairmanship of concerned District Collectors keeping in view the safety, security of wildlife in its natural environment within the Sanctuary and the river hood opportunities of the tribals and others, and other development

activities outside *vide* Government of Andhra Pradesh Memo No. 11747/For- 11(2)12006, EFS&T (For-III) Dept, dated the 13th March, 2012. Accordingly meetings were convened by the District Collectors and District Magistrates of Kurnool, Prakasam and Guntur Districts for declaration of Eco-sensitive Zone all round the Rajiv Gandhi Wildlife Sanctuary and buffer area of the Sanctuary. It was discussed in the meetings that the Buffer Zone area acts as a good shock absorber for the Tiger Reserve and support wildlife that disperse out from the core area. In order to provide better protection to the Tiger Reserve and to minimise the pressure on the core area and to provide additional protection, Eco-sensitive Zone has been proposed all around the Tiger Reserve; wherever there are no "Reserve Forests" adjoining the Tiger Reserve, revenue lands have been proposed as Eco-sensitive Zone. Hence, there is a need of Eco-sensitive Zone around the Nagarjunasagar Srisailam Tiger Reserve;

AND WHEREAS, the Nagarjunasagar Srisailam Tiger Reserve is falling in four forest divisions *viz,* Atmakur, Markapur, Giddarur and Nandyal wildlife divisions. Some parts of the Eco-sensitive Zone of the Tiger Reserve are agricultural fields. These agricultural lands are patta lands in general and are legally enjoyed by the occupants. The main agricultural crops are maize, groundnut, sunflower, chillies, cotton, paddy, etc. The agricultural fields located in the Eco-sensitive Zone are frequented by the herbivores like deer and wild boar and carnivores follow in search of these animals. On declaration of this area as Eco-sensitive Zone, there will be additional protection to the Wildlife and its habitat. Livelihood activities of the villagers especially farmers, whose lands are falling in the Eco-sensitive Zone will not be affected as there are no restrictions for the ongoing agricultural practices and other traditional livelihood activities in the revenue lands outside the forest area;

AND WHEREAS, it is necessary to conserve and protect the area, the extent and boundaries of which are specified in paragraph 1, around the Nagarjunasagar Srisailam Tiger Reserve as Eco-sensitive Zone from ecological, environmental and biodiversity point of view and to prohibit industries or class of industries and their operations and processes in the said Eco-sensitive Zone;

NOW, THEREFORE, in exercise of the powers conferred by sub-section (1) and clauses (v) and (xiv) of sub-section (2) and sub-section (3) of section 3 of the Environment (Protection) Act, 1986 (29 of 1986) (hereafter in this notification referred to as the Environment Act), read with sub-rule (3) of rule 5 of the Environment (Protection) Rules, 1986, the Central Government hereby notifies an area to an extent varying from 0 (zero) to 26 kilometres around the boundary of Nagarjunasagar Srisailam Tiger Reserve, in Prakasam, Kurnool and Guntur Districts in the State of Andhra Pradesh as the Nagarjunasagar Srisailam Tiger Reserve Eco-sensitive Zone (hereafter in this notification referred to as the Eco-sensitive Zone) details of which are as under, namely: -

1. **Extent and boundaries of Eco-sensitive Zone.** – (1) The Eco-sensitive Zone shall be to an extent of 0 (zero) to 26 kilometres around the boundary of Nagarjunasagar Srisailam Tiger Reserve and the area of the Eco-sensitive Zone is 2149.68 square kilometres. *(Zero extent of Eco-sensitive Zone is due to Krishna River and interstate boundary with Telangana).*

   (2) The boundary description of Nagarjunasagar Srisailam Tiger Reserve and its Eco-sensitive Zone is appended in **Annexure-I.**

   (3) The maps of the Nagarjunasagar Srisailam Tiger Reserve demarcating Eco-sensitive Zone along with boundary details and latitudes and longitudes are appended as **Annexure-IIA, Annexure-IIB** and **Annexure-IIC.**

   (4) Lists of geo-coordinates of the boundary of Nagarjunasagar Srisailam Tiger Reserve and Eco-sensitive Zone are given in Table **A** and Table **B** of **Annexure-III.**

   (5) The list of villages falling in the Eco-sensitive Zone along with their geo co-ordinates at prominent points is appended as **Annexure-IV.**

2. **Zonal Master Plan for Eco-sensitive Zone.**-(1) The State Government shall, for the purposes of the Eco-sensitive Zone prepare a Zonal Master Plan within a period of two years from the date of publication of this notification in the Official Gazette, in consultation with local people and adhering to the stipulations given in this notification and get it duly approved by the competent authority in the State.

   (2) The Zonal Master Plan for the Eco-sensitive Zone shall be prepared by the State Government in such manner as is specified in this notification and also in consonance with the relevant Central and State laws and the guidelines issued by the Central Government, if any.

   (3) The Zonal Master Plan shall be prepared in consultation with the following Departments of the State Government, for integrating the ecological and environmental considerations into the said plan:-
   (i) Environment;
   (ii) Forest and Wildlife;

(iii) Tourism;
(iv) Tribal Welfare;
(v) Agriculture;
(vi) Irrigation and Flood Control;
(vii) Panchayati Raj;
(viii) Revenue;
(ix) Rural and Urban Development;
(x) Industries;
(xi) Municipal;
(xii) Transmission Corporation Of Andhra Pradesh (APTRANSCO);
(xiii) Andhra Pradesh State Pollution Control Board; and
(xiv) Public Works Department.

(4) The Zonal Master Plan shall not impose any restriction on the approved existing land use, infrastructure and activities, unless so specified in this notification and the Zonal Master Plan shall factor in improvement of all infrastructure and activities to be more efficient and eco-friendly.

(5) The Zonal Master Plan shall provide for restoration of denuded areas, conservation of existing water bodies, management of catchment areas, watershed management, groundwater management, soil and moisture conservation, needs of local community and such other aspects of the ecology and environment that need attention.

(6) The Zonal Master Plan shall demarcate all the existing worshipping places, villages and urban settlements, types and kinds of forests, agricultural areas, fertile lands, green area, such as, parks and like places, horticultural areas, orchards, lakes and other water bodies with supporting maps giving details of existing and proposed land use features.

(7) The Zonal Master Plan shall provide mechanism for regulating developmental activities in Eco-sensitive Zone and adhere to prohibited and regulated activities listed in the Table in paragraph 4 and also ensure and promote eco-friendly development for security of local communities' livelihood.

(8) The Zonal Master Plan shall be co-terminus with the Regional Development Plan.

(9) The Zonal Master Plan so approved by the State Government shall be the reference document for the Monitoring Committee for carrying out its functions of monitoring in accordance with the provisions of this notification.

3. **Measures to be taken by State Government**.- The State Government shall take the following measures for giving effect to the provisions of this notification, namely:-

(1) Land use.– (a) Forests, horticulture areas, agricultural areas, parks and open spaces earmarked for recreational purposes in the Eco-sensitive Zone shall not be used or converted into areas for commercial or residential or industrial activities:

Provided that the conversion of agricultural and other lands, for the purposes other than that specified in clause (a) above, within the Eco-sensitive Zone may be permitted on the recommendation of the Monitoring Committee, and with the prior approval of the competent authority under Regional Town Planning Act and other rules and regulations of the Central Government or State Government as applicable and *vide* provisions of this notification, to meet the residential needs of the local residents and for activities such as-

(i) widening and strengthening of existing roads and construction of new roads;
(ii) construction and renovation of infrastructure and civic amenities;
(iii) small scale industries not causing pollution;
(iv) cottage industries including village industries; convenience stores and local amenities supporting eco-tourism including home stay; and
(v) promoted activities given in paragraph 4:

Provided further that no use of tribal land shall be permitted for commercial and industrial development activities without the prior approval of the competent authority under Regional Town Planning Act and other rules and regulations of the State Government and without compliance of the provisions of article 244 of the Constitution or the law for the time being in force, including the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 (2 of 2007):

Provided also that any error appearing in the land records within the Eco-sensitive Zone shall be corrected by the State Government, after obtaining the views of Monitoring Committee, once in each case and the correction of said error shall be intimated to the Central Government in the Ministry of Environment, Forest and Climate Change:

Provided also that the correction of error shall not include change of land use in any case except as provided under this sub-paragraph.

(b) Efforts shall be made to reforest the unused or unproductive agricultural areas with afforestation and habitat restoration activities.

(2) Natural water bodies.-The catchment areas of all natural springs shall be identified and plans for their conservation and rejuvenation shall be incorporated in the Zonal Master Plan and the guidelines shall be drawn up by the State Government in such a manner as to prohibit development activities at or near these areas which are detrimental to such areas.

(3) Tourism or eco-tourism.- (a) All new eco-tourism activities or expansion of existing tourism activities within the Eco-sensitive Zone shall be as per the Tourism Master Plan for the Eco-sensitive Zone.

(b) The Tourism Master Plan shall be prepared by the State Department of Tourism in consultation with the State Departments of Environment and Forests.

(c) The Tourism Master Plan shall form a component of the Zonal Master Plan.

(d) The Tourism Master Plan shall be drawn based on the study of carrying capacity of the Eco-sensitive Zone.

(e) The activities of eco-tourism shall be regulated as under, namely:-

(i) new construction of hotels and resorts shall not be allowed within one kilometre from the boundary of the protected area or upto the extent of the Eco-sensitive Zone, whichever is nearer:

Provided that beyond the distance of one kilometre from the boundary of the protected area till the extent of the Eco-sensitive Zone, the establishment of new hotels and resorts shall be allowed only in pre-defined and designated areas for eco-tourism facilities as per Tourism Master Plan;

(ii) all new tourism activities or expansion of existing tourism activities within the Eco-sensitive Zone shall be in accordance with the guidelines issued by the Central Government in the Ministry of Environment, Forest and Climate Change and the eco-tourism guidelines issued by the National Tiger Conservation Authority (as amended from time to time) with emphasis on eco-tourism, eco-education and eco-development;

(iii) until the Zonal Master Plan is approved, development for tourism and expansion of existing tourism activities shall be permitted by the concerned regulatory authorities based on the actual site specific scrutiny and recommendation of the Monitoring Committee and no new hotel, resort or commercial establishment construction shall be permitted within Eco-sensitive Zone area.

(4) Natural heritage.- All sites of valuable natural heritage in the Eco-sensitive Zone, such as the gene pool reserve areas, rock formations, waterfalls, springs, gorges, groves, caves, points, walks, rides, cliffs, etc. shall be identified and a heritage conservation plan shall be drawn up for their preservation and conservation as a part of the Zonal Master Plan.

(5) Man-made heritage sites.- Buildings, structures, artefacts, areas and precincts of historical, architectural, aesthetic, and cultural significance shall be identified in the Eco-sensitive Zone and heritage conservation plan for their conservation shall be prepared as part of the Zonal Master Plan.

(6) Noise pollution. - Prevention and control of noise pollution in the Eco-sensitive Zone shall be carried out in accordance with the provisions of the Noise Pollution (Regulation and Control) Rules, 2000 under the Environment Act.

(7) Air pollution.- Prevention and control of air pollution in the Eco-sensitive Zone shall be carried out in accordance with the provisions of the Air (Prevention and Control of Pollution) Act, 1981 (14 of 1981) and the rules made thereunder.

(8) Discharge of effluents.- Discharge of treated effluent in Eco-sensitive Zone shall be in accordance with the provisions of the General Standards for Discharge of Environmental Pollutants covered under the

Environment Act and the rules made thereunder or standards stipulated by the State Government, whichever is more stringent.

(9) Solid wastes.- Disposal and management of solid wastes shall be as under:-

(a) the solid waste disposal and management in the Eco-sensitive Zone shall be carried out in accordance with the Solid Waste Management Rules, 2016, published by the Government of India in the Ministry of Environment, Forest and Climate Change *vide* notification number S.O. 1357 (E), dated the 8th April, 2016; the inorganic material may be disposed in an environmental acceptable manner at site identified outside the Eco-sensitive Zone;

(b) safe and Environmentally Sound Management of Solid wastes in conformity with the existing rules and regulations using identified technologies may be allowed within Eco-sensitive Zone.

(10) Bio-medical waste.– Bio-medical waste management shall be as under:-

(a) the Bio-medical waste disposal in the Eco-sensitive Zone shall be carried out in accordance with the Bio-Medical Waste Management Rules, 2016, published by the Government of India in the Ministry of Environment, Forest and Climate Change *vide* notification number G.S.R. 343 (E), dated the 28th March, 2016.

(b) safe and Environmentally Sound Management of Bio-Medical Wastes in conformity with the existing rules and regulations using identified technologies may be allowed within the Eco-sensitive Zone.

(11) Plastic waste management.- The plastic waste management in the Eco-sensitive Zone shall be carried out as per the provisions of the Plastic Waste Management Rules, 2016, published by the Government of India in the Ministry of Environment, Forest and Climate Change *vide* notification number G.S.R. 340(E), dated the 18th March, 2016, as amended from time to time.

(12) Construction and demolition waste management.- The construction and demolition waste management in the Eco-sensitive Zone shall be carried out as per the provisions of the Construction and Demolition Waste Management Rules, 2016 published by the Government of India in the Ministry of Environment, Forest and Climate Change *vide* notification number G.S.R. 317(E), dated the 29th March, 2016, as amended from time to time.

(13) E-waste.- The e - waste management in the Eco-sensitive Zone shall be carried out as per the provisions of the E-Waste Management Rules, 2016, published by the Government of India in the Ministry of Environment, Forest and Climate Change, as amended from time to time.

(14) Vehicular traffic.– The vehicular movement of traffic shall be regulated in a habitat friendly manner and specific provisions in this regard shall be incorporated in the Zonal Master Plan and till such time as the Zonal Master plan is prepared and approved by the competent authority in the State Government, the Monitoring Committee shall monitor compliance of vehicular movement under the relevant Acts and the rules and regulations made thereunder.

(15) Vehicular pollution.- Prevention and control of vehicular pollution shall be incompliance with applicable laws and efforts shall be made for use of cleaner fuels.

(16) Industrial units.– (a) On or after the publication of this notification in the Official Gazette, no new polluting industries shall be permitted to be set up within the Eco-sensitive Zone.

(b) Only non-polluting industries shall be allowed within Eco-sensitive Zone as per the classification of Industries in the guidelines issued by the Central Pollution Control Board in February, 2016, as amended from time to time, unless so specified in this notification, and in addition, the non-polluting cottage industries shall be promoted.

(17) Protection of hill slopes.- The protection of hill slopes shall be as under:-

(a) the Zonal Master Plan shall indicate areas on hill slopes where no construction shall be permitted;

(b) construction on existing steep hill slopes or slopes with a high degree of erosion shall not be permitted.

4. List of activities prohibited or to be regulated within Eco-sensitive Zone.- All activities in the Eco-sensitive Zone shall be governed by the provisions of the Environment Act and the rules made thereunder including the Coastal Regulation Zone, 2011 and the Environmental Impact Assessment Notification, 2006 and other applicable laws including the Forest (Conservation) Act, 1980 (69 of 1980), the Indian Forest Act, 1927 (16 of 1927), the

Wildlife (Protection) Act 1972 (53 of 1972), and amendments made thereto and be regulated in the manner specified in the Table below, namely:-

TABLE

S. No. (1)	Activity (2)	Description (3)
	A. Prohibited Activities	
1.	Commercial mining, stone quarrying and crushing units.	(a) All new and existing mining (minor and major minerals), stone quarrying and crushing units shall be prohibited with immediate effect except for meeting the domestic needs of bona fide local residents including digging of earth for construction or repair of houses within the Eco-sensitive Zone; (b) The mining operations shall be carried out in accordance with the order of the Hon'ble Supreme Court dated the 4th August, 2006 in the matter of T.N. Godavarman Thirumulpad Vs. UOI in W.P.(C) No.202 of 1995 and dated the 21st April, 2014 in the matter of Goa Foundation Vs. UOI in W.P.(C) No.435 of 2012.
2.	Setting of industries causing pollution (water, air, soil, noise, etc.).	New industries and expansion of existing polluting industries in the Eco-sensitive Zone shall not be permitted: Provided that non-polluting industries shall be allowed within the Eco-sensitive Zone as per classification of Industries in the guidelines issued by the Central Pollution Control Board in February, 2016, as amended from time to time, unless so specified in this notification and in addition the non-polluting cottage industries shall be promoted.
3.	Establishment of major hydro-electric project.	Prohibited.
4.	Use or production or processing of any hazardous substances.	Prohibited.
5.	Discharge of untreated effluents in natural water bodies or land area.	Prohibited.
6.	Setting up of new saw mills.	New or expansion of existing saw mills shall not be permitted within the Eco-sensitive Zone.
7.	Setting up of brick kilns.	Prohibited.
8.	Commercial use of firewood.	Prohibited.
	B. Regulated Activities	
9.	Commercial establishment of hotels and resorts.	No new commercial hotels and resorts shall be permitted within one kilometer of the boundary of the protected area or upto the extent of Eco-sensitive Zone, whichever is nearer, except for small temporary structures for eco-tourism activities: Provided that, beyond one kilometer from the boundary of the protected area or upto the extent of Eco-sensitive Zone, whichever is nearer, all new tourist activities or expansion of existing activities shall be in conformity with the Tourism Master Plan and guidelines as applicable.
10.	Construction activities.	(a) New commercial construction of any kind shall not be permitted within one kilometer from the boundary of the

S. No. (1)	Activity (2)	Description (3)
		protected area or upto extent of the Eco-sensitive Zone, whichever is nearer: Provided that, local people shall be permitted to undertake construction in their land for their use including the activities mentioned in sub-paragraph (1) of paragraph 3 as per building bye-laws to meet the residential needs of the local residents: Provided further that the construction activity related to small scale industries not causing pollution shall be regulated and kept at the minimum, with the prior permission from the competent authority as per applicable rules and regulations, if any. (b) Beyond one kilometer it shall be regulated as per the Zonal Master Plan.
11.	Small scale non polluting industries.	Non polluting industries as per classification of industries issued by the Central Pollution Control Board in February, 2016 as amended from time to time, and non-hazardous, small-scale and service industry, agriculture, floriculture, horticulture or agro-based industry producing products from indigenous materials from the Eco-sensitive Zone shall be permitted by the competent authority.
12.	Felling of trees.	(a) There shall be no felling of trees in the forest or Government or revenue or private lands without prior permission of the competent authority in the State Government. (b) The felling of trees shall be regulated in accordance with the provisions of the concerned Central or State Act and the rules made thereunder.
13.	Collection of Forest Produce or Non-Timber Forest Produce.	Regulated as per the applicable laws.
14.	Erection of electrical and communication towers and laying of cables and other infrastructures.	Regulated under applicable laws (underground cabling may be promoted).
15.	Infrastructure including civic amenities.	Taking measures of mitigation as per the applicable laws, rules and regulations and available guidelines.
16.	Widening and strengthening of existing roads and construction of new roads.	Taking measures of mitigation as per the applicable laws, rules and regulations and available guidelines.
17.	Undertaking other activities related to tourism like flying over the Eco-sensitive Zone area by hot air balloon, helicopter, drones, microlites, etc.	Regulated as per the applicable laws.
18.	Protection of hill slopes and river banks.	Regulated as per the applicable laws.
19.	Movement of vehicular traffic at night.	Regulated for commercial purpose under applicable laws.
20.	Ongoing agriculture and horticulture practices by local communities along with dairies, dairy farming, aquaculture and fisheries.	Permitted as per the applicable laws for use of locals.
21.	Establishment of large-scale commercial livestock and poultry farms by firms,	Regulated (except otherwise provided) as per the applicable laws except for meeting local needs.

S. No. (1)	Activity (2)	Description (3)
	corporate and companies.	
22.	Discharge of treated waste water or effluents in natural water bodies or land area.	The discharge of treated waste water or effluents shall be avoided to enter into the water bodies and efforts shall be made for recycle and reuse of treated waste water. Otherwise the discharge of treated waste water or effluent shall be regulated as per the applicable laws.
23.	Commercial extraction of surface and ground water.	Regulated as per the applicable laws.
24.	Solid waste management.	Regulated as per the applicable laws.
25.	Introduction of exotic species.	Regulated as per the applicable laws.
26.	Eco-tourism.	Regulated as per the applicable laws.
27.	Use of polythene bags.	Regulated as per the applicable laws.
28.	Commercial sign boards and hoardings.	Regulated as per the applicable laws.
29.	Use of explosives for development activities.	Regulated as per the applicable laws.
	C. Promoted Activities	
30.	Rain water harvesting.	Shall be actively promoted.
31.	Organic farming.	Shall be actively promoted.
32.	Adoption of green technology for all activities.	Shall be actively promoted.
33.	Cottage industries including village artisans, etc.	Shall be actively promoted.
34.	Use of renewable energy and fuels.	Bio-gas, solar light, etc. shall be actively promoted.
35.	Agro-forestry.	Shall be actively promoted.
36.	Plantation of horticulture and herbals.	Shall be actively promoted.
37.	Use of eco-friendly transport.	Shall be actively promoted.
38.	Skill development.	Shall be actively promoted.
39.	Restoration of degraded land/ forests/ habitat.	Shall be actively promoted.
40.	Environmental awareness.	Shall be actively promoted.

5. **Monitoring Committee for monitoring Eco-sensitive Zone Notification.**- For effective monitoring of the provisions of this notification, the Central Government hereby constitutes a Monitoring Committee under the provisions of sub-section (3) of section 3 of the Environment (Protection) Act, 1986, comprising of the following, namely:-

Sl. No.	Constituent of the Monitoring Committee	Designation
(i)	District Collector, concerned district	Chairman, *ex officio;*
(ii)	A representative of non-Governmental organisation working in the field of wildlife conservation to be nominated by the State Government	Member;
(iii)	Environmental Engineer, concerned district, Andhra Pradesh State Pollution Control Board	Member, *ex officio;*
(iv)	Project Officer, concerned Integrated Tribal Development Agency (ITDA)	Member;

(v)	Superintending Engineer, Road and Building, concerned district	Member;
(vi)	An expert in Biodiversity and Ecology nominated by the State Government	Member;
(vii)	Assistant Director, Mines and Geology of concerned district	Member;
(viii)	Joint Director, Agriculture, concerned district	Member;
(ix)	District Tourism Officer, concerned district	Member;
(x)	General Manager, District Industries Centre, concerned district.	Member;
(xi)	District Wildlife Warden, Concerned Divisional Forest Officer	Member-Secretary.

6. Terms of reference. – (1) The Monitoring Committee shall monitor the compliance of the provisions of this notification.

(2) The tenure of the Monitoring committee shall be till further orders, provided that the non-official members of the Committee shall be nominated by the State Government from time to time.

(3) The activities that are covered in the Schedule to the notification of the Government of India in the erstwhile Ministry of Environment and Forests number S.O. 1533 (E), dated the 14th September, 2006, and are falling in the Eco-sensitive Zone, except for the prohibited activities as specified in the Table under paragraph 4 thereof, shall be scrutinised by the Monitoring Committee based on the actual site-specific conditions and referred to the Central Government in the Ministry of Environment, Forest and Climate Change for prior environmental clearances under the provisions of the said notification.

(4) The activities that are not covered in the Schedule to the notification of the Government of India in the erstwhile Ministry of Environment and Forest number S.O. 1533 (E), dated the 14th September, 2006 and are falling in the Eco-sensitive Zone, except for the prohibited activities as specified in the Table under paragraph 4 thereof, shall be scrutinised by the Monitoring Committee based on the actual site-specific conditions and referred to the concerned regulatory authorities.

(5) The Member-Secretary of the Monitoring Committee or the concerned Deputy Commissioner(s) shall be competent to file complaints under section 19 of the Environment Act, against any person who contravenes the provisions of this notification.

(6) The Monitoring Committee may invite representatives or experts from concerned Departments, representatives from industry associations or concerned stakeholders to assist in its deliberations depending on the requirements on issue to issue basis.

(7) The Monitoring Committee shall submit the annual action taken report of its activities as on the 31st March of every year by the 30th June of that year to the Chief Wildlife Warden in the State as per proforma appended as Annexure V.

(8) The Central Government in the Ministry of Environment, Forest and Climate Change may give such directions, as it deems fit, to the Monitoring Committee for effective discharge of its functions.

7. Additional measures.- The Central Government and State Government may specify additional measures, if any, for giving effect to provisions of this notification.

8. Orders of Supreme Court, etc.- The provisions of this notification shall be subject to the orders, if any passed or to be passed by the Hon'ble Supreme Court of India or High Court or the National Green Tribunal.

[F. No. 25/86/2015-ESZ-RE]

Dr. SATISH C. GARKOTI, Scientist 'G'

ANNEXURE- I

BOUNDARY DESCRIPTION OF ECO-SENSITIVE ZONE AROUND NAGARJUNASAGAR SRISAILAM TIGER RESERVE IN THE STATE OF ANDHRA PRADESH

(A to D):- The Eco-sensitive Zone starts from station 'A' (south west corner of comp. 644) in Velgode RF of Velgode Range as shown in the map. The GPS co-ordinates of station A is 15.73300N, 78.61000E and the Eco-sensitive Zone runs in western direction along the southern boundary of Compartment Nos. 646, 647, 648,

649 in Velgode RF of Velgode range and reaches south west corner of compartment No 649. Then the line runs towards north west direction in zigzag manner along the western boundary of compartment Nos. 649, 650, 651, 653 and 652 in Velgode RF of Velgode Range till it reaches the northern corner of compartment 652 and further proceeds towards south and eastern directions in a zigzag manner with a width of 100 Mts. along the northern boundary of compartment Nos. 653, 656 of Velgode Range and Compt. Nos. 697, 698, 700, 701 of Bairluty Range. Thence it moves in north east direction along the western boundary of compartment No.747 and meets point 'B' on Kurnool-Guntur road at the north–west corner of compartment No.747. GPS co-ordinates of Station 'B' is 15.86642 N, 78.69979E.

Thence, the boundary line runs towards north – west direction in a Zigzag manner with a width of 100 Mts outside R.F boundary of Guvvalakunta 'C' R.F of Nagaluty Range along the western boundary of compartment Nos.748, 749, 750, 832, 833, 834, 835 and meets the Northern corner of Compartment No. 835. Thence the boundary line runs towards Western direction in Zig – Zag manner with a width of 100 meters from the notified buffer of NSTR and along the Southern boundary of Compartment Nos. 816, 821, 822, 823, 824 and meets Station 'C' as shown on map which is on the south west corner of Compartment No.824, Guvvalakuntla-B RF, Atmakur Range. The GPS co-ordinates of Station 'C' is 15.97570N, 78.50460E.

Thence the boundary runs in northern direction in zigzag manner along the western boundary of compartment Nos.824, 797, 793, 794 in Nandikotkur RF of Atmakur Range and reaches point 'D' as shown in the map which is on the northwest corner of compartment No.794. The GPS reading of station 'D' is 16.05913N, 78.49756E.

(D to E):-The Eco-sensitive Zone boundary from D to E runs along the central line (Mid line) of river Krishna which is inter State boundary between Andhra Pradesh and Telangana i.e., the boundary between Rajiv Gandhi Wildlife Sanctuary of Nagarjunasagar Srisailam Tiger Reserve, Andhra Pradesh on the southern side and Amrabad Tiger Reserve of Telangana State on the northern side of river Krishna.

The Eco-sensitive Zone boundary moves along mid of River Krishna from point 'D' in zig-zag manner in Srisailam, G.V Palli and V.P South Ranges and touches the Nagarjunasagar reservoir and further proceeds in north eastern direction along the mid of river Krishna till it reaches point 'E' i.e., one Km from the northern part of compartment No.88 of Tummarkota RF of V.P South Range. The GPS coordinates of station 'E' is 16.61847N, 79.46114E.

(E to G): Thence the Eco-sensitive Zone boundary line runs from point E towards southern direction in zigzag manner with a width of '1'Km from Rajiv Gandhi Wildlife Sanctuary boundary and along the eastern boundary of compartment No.88, then turns towards west and further south and moves at a distance of 1 km from the eastern boundary of Compartment No.87 and meets station 'F' as shown in the map. The GPS coordinates of station 'F' is 16.52433N, 79.44743E.

Thence the Eco sensitive Zone runs from point F towards Western direction in a zigzag manner with a width of '1' Km from Rajiv Gandhi Wildlife Sanctuary boundary south of compartment Nos.87, 86 and 85. Then, turns towards south west 1km from the north east corner of compartment No.83 of Pasuvemula RF, V.P South Range.

Thence the eco-sensitive zone boundary line runs towards south and moves in a zig–zag manner with a width of '1' Km from Rajiv Gandhi Wildlife Sanctuary boundary on the east of compartment Nos.83, 77, 75, 70 and 69 of Kandlagunta RF and compartment Nos.68 and 67 of Gangulagunta RF of V.P South Range till it touches the western boundary of compartment No.64. Then it turns towards north east, passes along the western boundary of compartment No.64 which is notified buffer of NSTR. Thence it turns south and moves in various directions along the north west boundary of compartment No.64, western, northern and eastern boundaries of compartment No.63 and meets station 'G' which is located on District boundary of Guntur and Prakasam Districts as depicted in the map. The GPS coordinates of station 'G' is 16.23081N, 79.33778E.

(G to I): Thence the Eco-sensitive Zone boundary line starts from station 'G' in Markapur Division of Prakasam District and runs towards Southern direction in zig–zag manner along the notified buffer of NSTR and the eastern boundary of compartment Nos.200, 199, 185, 182 of Markapur RF compartment Nos. 174, 169 of ENB-XI RF, compartment 168, 167, 175 of EN Block X RF in Y.Palem Range and turns towards south and moves along the southern boundary of compartment Nos.175 and 166. Thence the boundary line runs towards south and moves in a zigzag manner with a width of '5' Kms from Rajiv Gandhi Wildlife Sanctuary boundary and touches the point on the western boundary of compartment No.160 of Y. Palem RF in Y. Palem Range. Thence it moves in north east direction along the notified buffer touching the western boundary of compartment Nos.160 and 161 and moves towards south east direction in zigzag manner along the boundaries of compartment Nos.162 and 163, turns towards west and moves along boundary of compartment Nos.164, 165 and 159 of Y. Palem RF and reaches point 'H' on the south west corner of compartment No.159 of notified buffer. The GPS coordinates of 'H' is 15.97874 N, 79.26384E.

From point 'H', the eco- sensitive zone boundary runs 5 kilometres from the Rajiv Gandhi Wildlife Sanctuary boundary in the revenue lands till it reaches the boundary of notified buffer at point "I' as indicated in the map. GPS coordinates of point 'I' is 15.88992 N, 79.04887E

(I to K): Then, the Eco-sensitive Zone boundary line runs from point 'I' in eastern direction along the northern boundary of compartment No.54 in Cumbum R.F. of Dornal Range and moves further towards eastern direction in zig–zag manner along the northern boundary of compartment No. 55 and 56 in Cumbum RF of Dornal Range and Compartment Nos.315,316,317 & 318 in ENB V RF of Markapur Range and meets the point 'J' on the north east corner of compt no 318. The GPS coordinates of point 'J' is 15.84889 N, 79.17745E.

Thence, the Eco-sensitive Zone boundary runs towards south and moves along the eastern boundary of Compartment No 318 in ENB V of Markapur Range, turns west and moves in a zig-zag manner along the southern boundary of Compartment Nos 318, 317, 316 and 315 of ENB V RF of Markapur Range and further runs along the southern boundary of compartment Nos.314 and 57 in ENB VI B RF and comp No. 58 in Cumbum RF of Dornal range passing along the notified buffer of Rajiv Gandhi Wildlife Sanctuary. Further, the Eco-sensitive Zone runs along the boundary of notified buffer towards South – West direction along the Eastern boundary of compartment No. 311, 269 & 270 in Cumbum R.F. and moves along the western boundary of compartment No.270 in Cumbum RF, southern boundary of compartment Nos. 267 and 266 in Cumbum R.F. of Markapur Range and runs towards south–west direction along the eastern boundary of compartment Nos.45, 44, 43 in Cumbum R.F of Dornal Range and meets point 'K'. The GPS coordinates of station 'K' is 15.79700N, 78.91500E, where the Eco-sensitive Zone of Rajiv Gandhi Wildlife Sanctuary meets the boundary of proposed buffer of Gundla Brahmeswaram Wildlife Sanctuary as depicted in the map.

(K to L): Then the Eco-sensitive Zone boundary line runs from point 'K' along the proposed buffer boundary of GBM in south-eastern direction along the eastern boundary of compartment No.822 and southern boundary of Compt. No.821 of Cumbum R.F. of Giddalur Division and moves further towards northern boundary of Compt. No.825, 824 and eastern boundary of Compt. No.823, 814 of ENB-III of Turimella Range of Giddalur Division. Then the Eco-sensitive Zone boundary line runs in southern direction and meets the proposed buffer boundary of GBM at Northern boundary of Compt. No.807 with a distance of 5 Kms from notified GBM Sanctuary boundary. Then the boundary line runs along the proposed buffer boundary in eastern direction along the Northern boundary of Compt. No.805, 755 and runs in southern direction along the eastern boundaries of Compt. No.756, 757 of ENB-II RF. Then the boundary line runs in South west direction along the southern boundary of Compt. No.757 of ENB-II RF and also western boundary of Compt. No.757 of ENB-II RF and touches the southern boundary of Compt.No.754 of ENB-II RF and runs towards southern direction along eastern boundary of Compt. No.753 of ENB-II RF. Thence it turns towards northerly direction and moves along the Western boundary of compt. No.753 of ENB-II RF, 792 of Ambavaram RF, 791 of ENB-II RF. Thence the line runs towards western direction and meets the southern boundary of Compt. No.790. Then the boundary line runs in southern direction and touches the Compt. No.762 with a distance of 5 Kms from the GBM Sanctuary boundary. Then the boundary line runs towards southern direction along the proposed buffer boundary of GBM and also eastern boundary of Compt. No.762, 761,763,764, 765 , 759 and up to Compt. No.758 of Ambavaram RF of Giddalur Division. Then the boundary line runs in south westerly direction and touches the eastern boundary of Compt. No.674 with a distance of 5 Kms from the GBM Sanctuary. Then the boundary line runs in zig-zag manner in southern direction along the proposed buffer boundary of GBM and also along the eastern boundary of Compt. No.668, 657, 658, 659, 645, 646, 647 of Uyyalawada Extn. RF, Compt. No. 636 and 637 of Uyyalawada RF of Giddalur Range of Giddalur Division and meets the point 'L'. The GPS coordinates of point 'L' is 15.19865 N, 78.86796E.

(L to M) : Then the Eco-sensitive Zone boundary line runs from point 'L' along the proposed buffer boundary of GBM in western direction along the southern boundary of Compt. No.637,638, 634, 633 and meets at south west corner point of Compt. No.632 and meets the point 'M'. The GPS coordinates of point 'M' is 15.18359 N, 78.74258 E.

(M to N) : Then the Eco-sensitive Zone boundary line runs from point 'M' along the proposed buffer boundary of GBM in northern direction along the western boundary of Compt. No.631,641, 653 and 663 of Uyyalawada RF of Giddalur Range of Giddalur Division and meets the point 'N'. The GPS coordinates of point 'N' is 15.29578 N, 78.73825 E.

(N to O) : Then the Eco-sensitive Zone boundary line runs from point 'N' along the proposed buffer boundary of GBM in western direction along the southern boundary of Compt. No.481, 478, 477, 474, 470 of Sirivel RF of Chalama Range of Nandyal Division and meets the point 'O'. The GPS coordinates of point 'O' is 15.30093 N, 78.63349 E.

(O to P) : Then the Eco-sensitive Zone boundary line runs from point 'O' along the proposed buffer boundary of GBM in northern direction in zig-zag manner along the western boundary of Compt. No.470, 471, 472 of

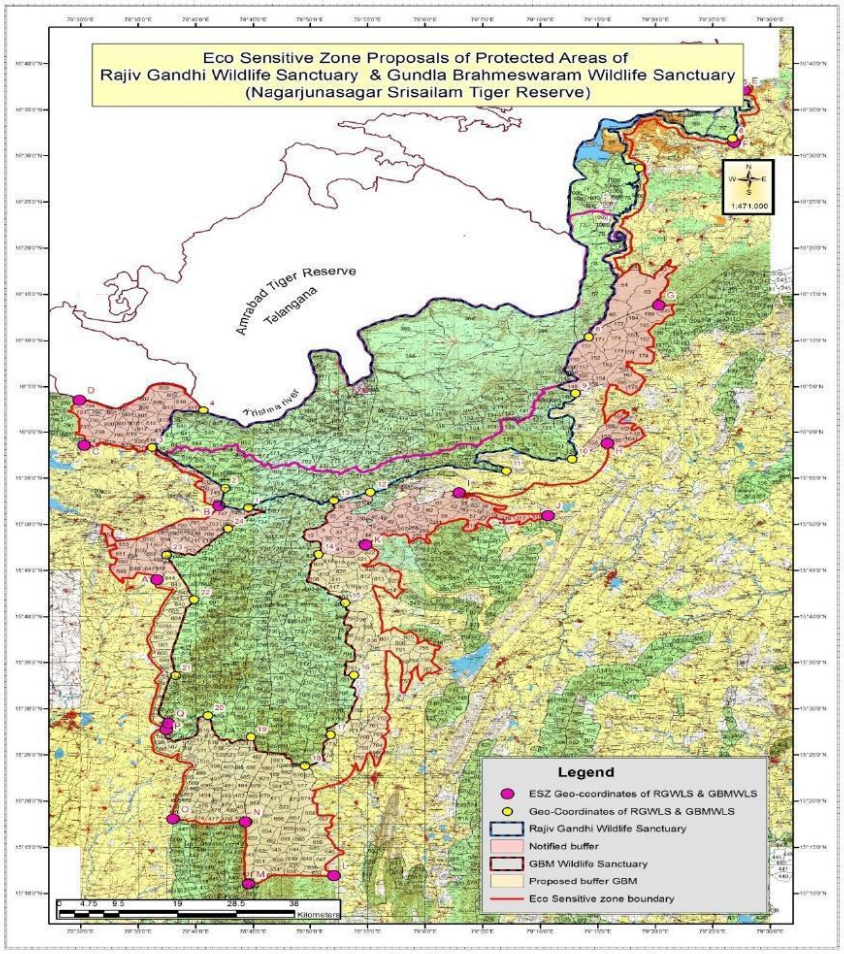
Sirivel RF and compt. No.503, 504 and 505 of Sirivel Extn. RF and then southern boundary of Compt. No.509 and then western boundary of compt. No.508 of Nandyal RF and then eastern boundary of Compt. No.507, 506 of Nandyal RF and then southern boundary of Compt. No.506. Then the boundary line runs towards northerly direction along the western boundary of Compt. No.506, 536, 537 and meets the point 'P' which is north west corner of Compt. No.566. The GPS coordinates of point 'P' is 15.46261 N, 78.62339 E.

(P to Q): Then the Eco-sensitive Zone boundary line runs from point 'P' north-western and south west direction in a small distance with a width of '5' mts along the western boundary of Compt. No.565 of Nandyal Range (Mahanandi Temple area) and meets the point 'Q'. The GPS coordinates of point 'Q' is 15.47375 N, 78.62659 E.

(Q to A) : Then the Eco-sensitive Zone boundary line runs from point 'Q' along the proposed buffer boundary of GBM in north west direction with a width of 500 Mts along the southern boundary of Compt. No.538 and 539 of Nandyal Extn. – II RF of Nandyal Range. Then the boundary line runs in zig-zag manner along the proposed buffer boundary of GBM with a width of 500 mts along the western boundary of Compt. No. 539 and 540 of Nandyal Range and 541, 542, 598, 599, 600, 601, 602, 603A, 604 and 605 of Bandi Atmakur Range of Nandyal Division (which is also junction point of Nandyal and Atmakur Divisions). Then the boundary line runs towards northern direction along the proposed buffer boundary of GBM to a width of 500 meters along the western boundary of Compt. No.640, 641, 642 and turns in western direction and runs along the southern boundary of Compt. No.643 and meets the point 'A' which is starting point as shown in the map.

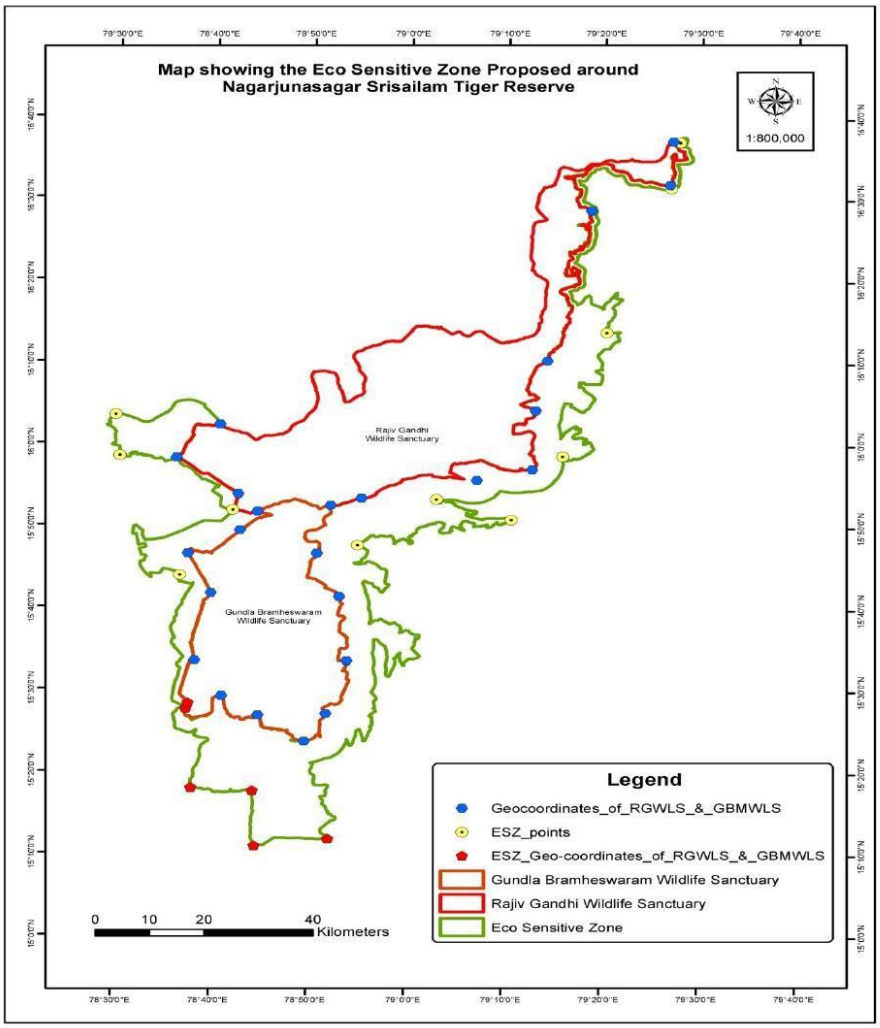
ANNEXURE- IIA

MAP OF ECO-SENSITIVE ZONE OF NAGARJUNASAGAR SRISAILAM TIGER RESERVE ALONG WITH LATITUDE AND LONGITUDE OF PROMINENT LOCATIONS



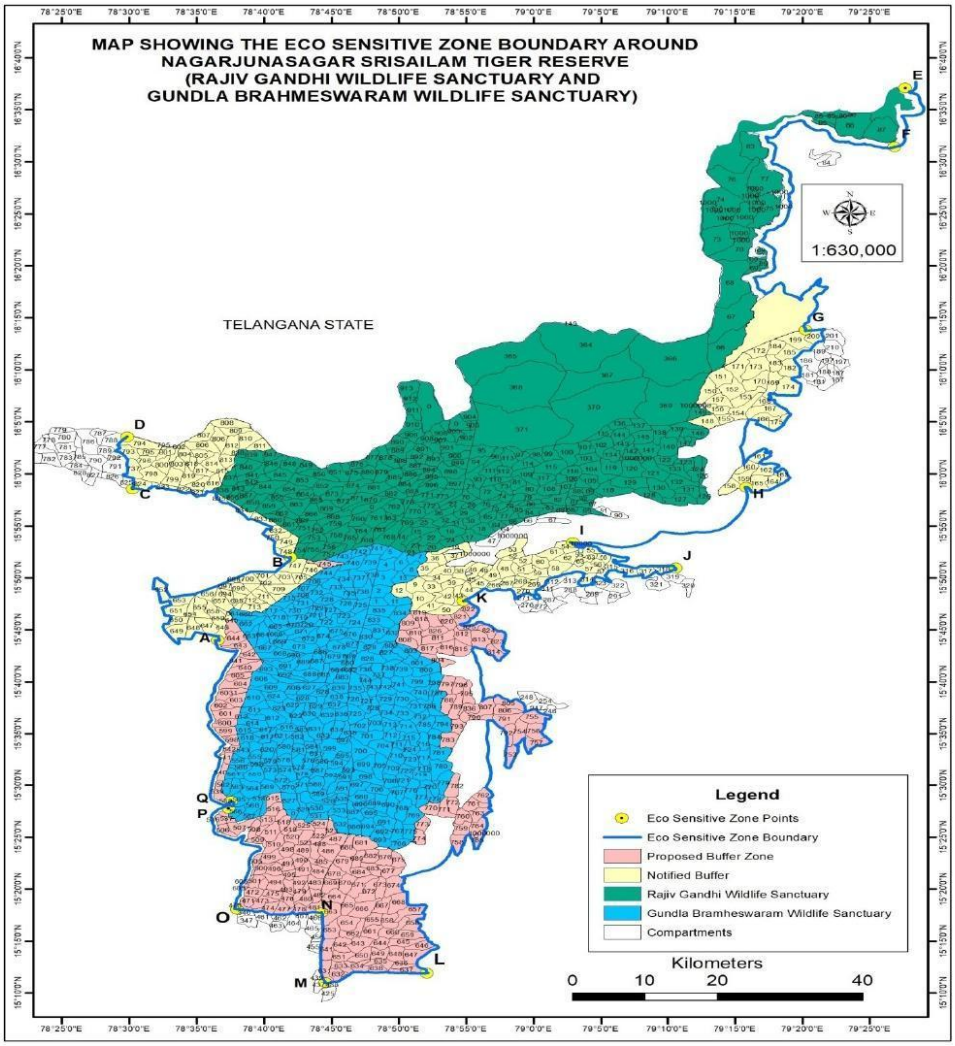
ANNEXURE- IIB

MAP OF ECO-SENSITIVE ZONE OF NAGARJUNASAGAR SRISAILAM TIGER RESERVE ALONG WITH LATITUDE AND LONGITUDE OF PROMINENT LOCATIONS



ANNEXURE- IIC

MAP OF ECO-SENSITIVE ZONE OF NAGARJUNASAGAR SRISAILAM TIGER RESERVE (RAJIV GANDHI WILDLIFE SANCTUARY AND GUNDLA BRAHMESWARAM WILDLIFE SANCTUARY) ALONG WITH LATITUDE AND LONGITUDE OF PROMINENT LOCATIONS



ANNEXURE-III

TABLE A: GEO- COORDINATES OF PROMINENT LOCATIONS OF NAGARJUNASAGAR SRISAILAM TIGER RESERVE

Station	Latitude (N)	Longitude (E)	Sanctuary
1	15.86300	78.74243	Rajiv Gandhi Wildlife Sanctuary
2	15.89830	78.70910	
3	15.97184	78.60298	

4	16.03997	78.67716	
5	16.62012	79.45007	
6	16.53153	79.44496	
7	16.47800	79.31000	
8	16.17320	79.23708	
9	16.07136	79.21732	
10	15.95114	79.21243	
11	15.92929	79.11756	
12	15.89127	78.92074	
13	15.87622	78.86808	
13	15.87622	78.86808	Gundla Brahmeswaram Wildlife Sanctuary
14	15.77900	78.84500	
15	15.69100	78.88400	
16	15.56100	78.89700	
17	15.45300	78.86300	
18	15.39700	78.82600	
19	15.44900	78.74600	
20	15.48800	78.68400	
21	15.56000	78.63700	
22	15.69700	78.66400	
23	15.77800	78.62400	
24	15.82500	78.71300	
1	15.86300	78.74243	

TABLE B: GEO-COORDINATES OF PROMINENT LOCATIONS OF ECO-SENSITIVE ZONE

Station	Latitude (N)	Longitude (E)	Sanctuary
A	15.73300	78.61000	Rajiv Gandhi Wildlife Sanctuary
B	15.86642	78.69979	
C	15.97570	78.50460	
D	16.05913	78.49756	
E	16.61847	79.46114	
F	16.52433	79.44743	
G	16.23081	79.33778	
H	15.97874	79.26384	
I	15.88992	79.04887	
J	15.84889	79.17745	
K	15.79700	78.91500	
K	15.79700	78.91500	Gundla Brahmeswaram Wildlife Sanctuary
L	15.19865	78.86796	
M	15.18359	78.74258	
N	15.29578	78.73825	

O	15.30093	78.63349	
P	15.46261	78.62339	
Q	15.47375	78.62659	
A	15.73300	78.61000	

ANNEXURE-IV

LIST OF VILLAGES COMING UNDER ECO-SENSITIVE ZONE OF NAGARJUNASAGAR SRISAILAM TIGER RESERVE ALONG WITH GEO-COORDINATES

Sl. No.	Name of the District	Name of the Division	Name of the Mandal	Name of the Village	Latitude (N)	Longitude (E)
1	Kurnool	Atmakur	Kothapalli	1. Palem Cheruvu	15.96580	78.59880
			Atmakur	2. Kottala Cheruvu	15.95360	78.61310
			Atmakur	3. Indireswaram Gudem	15.92350	78.64290
			Atmakur	4. S. N.Thanda	15.86780	78.68700
			Pamulapadu	5. Kotha Banakacherla	15.80170	78.53570
			Pamulapadu	6. Natla kothuru	15.78610	78.54340
			Velgodu	7. Sugali thanda	15.70850	78.63570
2	Prakasam	Markapur	Y. Palem	1. Gurrapusala	15.95561	79.23162
			Y. Palem	2. Kolukula	16.00963	79.22551
			Y. Palem	3. Chinna Kolukula	15.99697	79.22386
			Y. Palem	4. Chennarayunipalli	15.99064	79.21903
			Y. Palem	5. V. B. Puram	16.05672	79.25007
			Y. Palem	6. Ellareddypalli	16.06130	79.25724
			Y. Palem	7. G.V. Palli	16.03864	79.20682
			Dornala	8. Nallaguntla	15.86360	78.91930
			Dornala	9. P. Manthanala	15.88140	78.89320
			Dornala	10. Y. Cherlopalli	15.89390	78.96730
			Dornala	11. Chilakacherla	15.89190	79.00440
			Dornala	12. Gantavanipalli	15.91410	79.03760
			Dornala	13. Yadavalli	15.90720	79.06930
			Dornala	14. Pedda Dornala	15.90640	79.09510
			Dornala	15. Bommalapuram	15.94410	79.12840
			Pedda Araveedu	16. Tambadapalli	15.92900	79.18600
			Pedda Araveedu	17. Sanikavaram	15.90570	79.18290
			Pedda Araveedu	18. Ragumanupalli	15.92630	79.24340
			Pedda Araveedu	19. Masirajukunta	15.91160	79.22770
			Pedda Araveedu	20. Gangupalli	15.93250	79.23020
			Dornala	21. Peddamanthanala	15.88140	78.89320
3	Guntur	Markapur	Veldurthy	1. Davupalli thanda	16.23683	79.29350
			Veldurthy	2. Botukulapaya	16.24025	79.26847
			Veldurthy	3. Ramalayam Center	16.29508	79.31067

			Veldurthy	4. Vazralapadu thanda	16.28697	79.28517
			Veldurthy	5. Papireddykunta thanda	16.29764	79.29753
			Veldurthy	6. Hanumapuram thanda	16.29669	79.29053
			Veldurthy	7. Ramachandrapuram	16.28436	79.29903
			Veldurthy	8. Gangalakunta	16.29894	79.28889
			Veldurthy	9. Kandlakunta	16.38610	79.29483
			Veldurthy	10. Gudipati Cheruvu	16.40406	79.29933
			Veldurthy	11. Ramachandrapuram Thanda	16.31689	79.26742
			Veldurthy	12. Morasapenta Village Center	16.35408	79.28103
			Veldurthy	13. Zendapenta Village Center	16.37075	79.25133
			Veldurthy	14. K.P Gudem Busstand Center	16.39780	79.25750
		Markapur	Macherla	15. Bhiravunipadu Village	16.50235	79.39176
			Macherla	16. Tallapalli Village	16.51210	79.39063
			Macherla	17. 7th Mailu (Veeranjaneyapuram)	16.53572	79.38235
			Macherla	18. Pasuvemula Village	16.52077	79.36211
			Macherla	19. Narayana reddypuram	16.56817	79.41795
			Macherla	20. Econampet	16.57421	79.38905
			Macherla	21. Anupu gate	16.50360	79.28208
			Macherla	22. Chenchu Colony	16.50514	79.29403
			Macherla	23. Anupu Chenchu Colony	16.50371	79.28757
			Macherla	24. Anupu	16.50384	79.28647
			Macherla	25. Chintala thanda	16.52415	79.28915
			Rentachintala	26. Tumurukota	16.55717	79.46027
			Rentachintala	27. Kottagangarjupalli	16.57749	79.45113
			Rentachintala	28. Mallavaram	16.60145	79.47495
			Rentachintala	29. Palvai	16.50010	79.49014
			Rentachintala	30. Matukumalli	16.52026	79.47372
			Rentachintala	31. Gannavaram	16.52259	79.47292
4	Prakasam	Giddalur	Giddalur	1. Diguvametta	15.39629	78.82556
			Giddalur	2. K.S.Palli	15.37069	78.88324
			Giddalur	3. Bayanapalli	15.36681	78.85905
			Giddalur	4. Kanchipalli	15.36178	78.88292
			Giddalur	5. Yellupalli	15.42319	78.89159
			Giddalur	6. Jayarampuram	15.42222	78.88580
			Giddalur	7. Lakshmipuram Thanda	15.44582	78.87895
			Giddalur	8. Jayarampuram Thanda	15.43286	78.87523
			Racherla	9. J.P.Cheruvu	15.50104	78.92523
			Racherla	10. Chinaganipalli	15.52392	78.93881
			Racherla	11. Araveeti Kota	15.57821	78.92735

West (D to A) :- Then the line runs along western boundaries of Compartment Nos.836, 837, 840, 838 & 839 in Nandikotkur RF of Wildlife Management, Atmakur Division to Northernly direction, and then runs towards Easternly direction, along the northern boundary of Compartment Nos.839, 847 in Nandikotkur RF of Wildlife Management, Atmakur Division. Then the line runs to Northernly direction, along Western boundary of Compartment Nos.363, 364, 365, 368 & 369 in Amrabad RF of Wildlife Management, Achampet Division, then runs westerly direction along southern boundary of Compartment Nos.380, 386 to south west corner of Compartment No.386. Then the boundary runs from south west corner of Compartment No.386 to North-easternly direction in zig-zag manner along western boundaries of Compartment Nos.386, 385, 382, 383, 384, 40, 335, 336, 331, 311, 312, 313, 248 to North-West corner of Compartment No.248. Thence the line runs to Easternly direction in zig-zag manner along Northern boundaries of Compartment Nos.248, 247, 245, 227, 228, 194, 193, 192, 191, 190, 178, 177 and thence Northernly direction along Western boundary of compartment Nos.166, 165, 164, 163, 161 to meet the starting point 'A'.

N.B.: 1) All the enclosure with in the Reserve Forest and villages and private land covered in the specified limits except Srisailam, Sunnipenta and Egalpenta enciosures, shall stand included for the purpose of notification.

2) The local communities are entitled to the rights and concessions as admitted at the settlement of Forest Blocks until relocation.

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EFS & T Department.

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ANNEXURE - IX

Revenue and expenditure progress under APTCF Scheme for the Years 2014-15 to 2022-23 of Project Tiger, Circle, Nandyal (As per cash book).

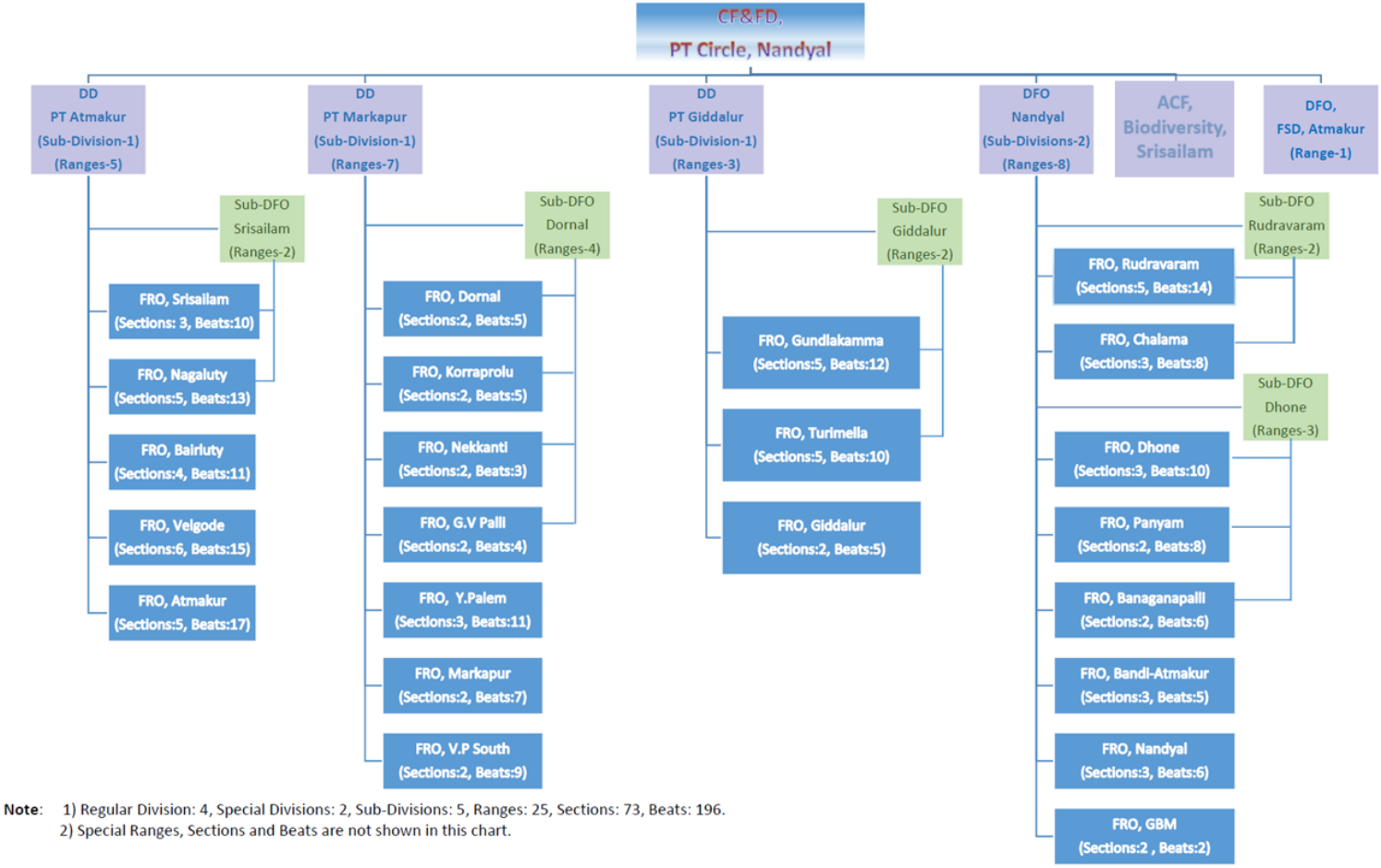
(Rs in lakhs)

Sl. No.	Name of the Division	Name of the Range	Name of the EMC Check post / Eco-Tourism	Year wise revenue realized									
				Date of Functioning	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
1	2	3	4	5	6	7	8	9	10	11	12	13	14
I	**EMC Check Posts**												
1	DD, PT, Markapur	Dornal	Ganapathi	03-06-2014	10.946	21.950	35.612	42.854	43.061	58.316	81.167	93.308	148.76
2		Dornal	Korraprolu	01-12-2016				63.997	69.35	105.673	135.464	138.103	182.445
3		V.P South	Sirigiripadu	21-03-2019					1.128	44.675	42.074	36.298	28.768
4		V.P South	Ethipothala cross road	26-02-2020					0	0.146	39.273	41.122	30.163
5		V.P South	Nagarjunasagar X road	26-02-2020					0	0.25	85.817	105.211	76.656
6		Y.Palem	Nerajamulathanda	15-06-2020					0	0	21.974	55.684	63.587
			Sub-Total		**10.946**	**21.95**	**35.612**	**106.851**	**113.539**	**209.06**	**405.769**	**469.726**	**530.379**
7	DD, PT, Atmakur	Bairluty	Bairluty	05-11-2016				64.190	64.859	104.479	119.519	145.1	135.97
8		Srisailam	Lingalagattu	12-12-2018					11.132	82.154	94.636	146.865	180.651
9		Srisailam	Sikharam	01-11-2019					0	42.772	78.891	110.259	156.292
			Sub-Total		**0.000**	**0.000**	**0.000**	**64.190**	**75.991**	**229.405**	**293.046**	**402.224**	**472.913**
10	DFO, Nandyal	Chalama	Pacherla	13-06-2019					-	75.435	136.764	153.238	140.401
11	DD, PT, Giddalur	Gundlakamma	Diguvametta	16-08-2019					-	65.827	141.412	134.471	129.128
			Sub-Total		**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**141.262**	**278.176**	**287.709**	**269.529**

					10.946	**21.950**	**35.612**	**171.041**	**189.530**	**579.727**	**976.991**	**1159.659**	**1272.821**
II	**Eco-Tourism**												
1	DD, PT, Atmakur	Nagaluty	Bairluty	10-07-2017				49.608	57.567	39.732	31.218	26.992	76.172
2	DD, PT, Markapur	Dornal	Thummalabailu	20-12-2017				3.840	9.173	6.258	4.004	8.651	26.755
3		G.V Palli	Nekkanti Jungle Ride	18-11-2021					-	-	-	50.000	158.580
4		V.P. South	Ethipothala Waterfalls (Veeranjaneyapuram)	24-04-2007									21.500
5	DFO, Nandyal	Chelama	Pacherla Eco-Tourism	22-04-2017									27.755
			Eco-Tourism Total		**0.000**	**0.000**	**0.000**	**53.448**	**66.740**	**45.990**	**35.222**	**85.643**	**310.762**
			Grand Total		**10.946**	**21.950**	**35.612**	**224.489**	**256.270**	**625.717**	**1012.213**	**1245.302**	**1583.583**

Sl. No	Name of the Sub Component	Year wise expenditure									Total
		2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	
1	Forest & Wildlife Protection	6.688	19.851	21.037	39.949	53.285	134.997	296.191	691.687	933.672	2197.357
2	Habitat Improvement					0	0	8.975	0	161.753	170.728
3	Man Animal Conflict				1.999	0.700	5.289	1.366	27.960	34.335	71.649
4	Eco Tourism and Eco-Development				17.800	37.325	50.173	33.753	48.164	246.057	433.272
5	Publicity & Extension				0.000	2.000	7.210	22.761	12.500	42.546	87.017
6	Wildlife Research and Monitoring					0	0	0	15.253	21.000	36.253
7	Staff Welfare				0.000	0.000	2.940	2.900	3.243	0	9.083
8	Office Support				9.750	5.617	35.030	32.076	51.016	83.665	217.154
	Total	**6.688**	**19.851**	**21.037**	**69.498**	**98.927**	**235.639**	**398.022**	**849.823**	**1523.028**	**3222.513**

ANNEXURE X: ADMINISTRATION HIERARCHY



Note: 1) Regular Division: 4, Special Divisions: 2, Sub-Divisions: 5, Ranges: 25, Sections: 73, Beats: 196.
2) Special Ranges, Sections and Beats are not shown in this chart.

ANNEXURE XI: Regular and Outsourcing staff in NSTR

STATEMENT SHOWING THE CADRE STRENGTH OF PROJECT TIGER CIRCLE, NANDYAL AS ON 01.08.2023

Sl. NO	Name of the Cadre	O/o FDPT CIRCLE NANDYAL (09150402001)			DD, PT, ATAMAKUR (09050402001)			DD, PT MARKAPUR (07090403003)			DD PT GIDDALUR (07060402001)			DFO, NANDYAL (09120402001)			DFO, FSD ATMAKUR (09050402002)			ACF BIODIVERSITY, SRISAILAM (09150402002)			TOTAL		
		S	W	V	S	W	V	S	W	V	S	W	V	S	W	V	S	W	V	S	W	V	S	W	V
1	Conservator of Forests	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
2	Divisional Forest Officers / Deputy Directors	0	0	0	1	1	0	1	1	0	0	0	0	1	0	1	0	0	0	0	0	0	3	2	1
3	Deputy Conservator of Forest	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	1	0	0	0	2	1	1
4	Assistant Conservator of Forest	0	0	0	1	0	1	1	0	1	1	0	1	2	0	2	0	0	0	1	1	0	6	1	5
5	Accounts Officer	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
6	Draughtsman Grade-I	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
7	Draughtsman Grade-II	0	0	0	1	0	1	1	0	1	1	0	1	1	1	0	0	0	0	0	0	0	4	1	3
8	Forest Range Officer	0	0	0	7	6	1	12	6	6	5	4	1	13	8	5	1	1	0	1	0	1	39	25	14
9	Deputy Range Officer	0	0	0	4	4	0	9	8	1	6	4	2	7	7	0	0	0	0	0	0	0	26	23	3
10	Forest Section Officer	0	0	0	27	22	5	35	7	28	19	7	12	40	20	20	2	1	1	2	1	1	125	58	67
11	Forest Beat Officer	0	0	0	80	30	50	124	40	84	57	24	33	99	51	48	4	1	3	0	0	0	364	146	218
12	Asst. Beat Officer	0	0	0	43	7	36	63	9	54	46	1	45	62	8	54	2	0	2	0	0	0	216	25	191
13	Superintendent	1	1	0	2	2	0	2	2	0	2	2	0	2	2	0	0	0	0	0	0	0	9	9	0

Sl. NO	Name of the Cadre	O/o FDPT CIRCLE NANDYAL (09150402001)			DD, PT, ATAMAKUR (09050402001)			DD, PT MARKAPUR (07090403003)			DD PT GIDDALUR (07060402001)			DFO, NANDYAL (09120402001)			DFO, FSD ATMAKUR (09050402002)			ACF BIODIVERSITY, SRISAILAM (09150402002)			TOTAL		
		S	W	V	S	W	V	S	W	V	S	W	V	S	W	V	S	W	V	S	W	V	S	W	V
14	Senior Assistant/ Accountant	4	3	1	5	4	1	5	5	0	4	3	1	7	7	0	0	0	0	0	0	0	25	22	3
15	Junior Assistant	5	2	3	8	5	3	7	6	1	7	5	2	7	4	3	0	0	0	0	0	0	34	22	12
16	Junior Assistant cum Typist	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
17	Typist	0	0	0	2	0	2	1	0	1	2	1	1	1	0	1	0	0	0	0	0	0	6	1	5
18	L.D. Steno	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
19	Research Assistant	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
20	Research Field Assistant	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
21	Research Tech. Asst. Lab	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
22	Live Stock Inspector	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
23	Projectionist	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
24	Driver (L.V.)	1	0	1	4	1	3	2	1	1	3	0	3	2	0	2	0	0	0	1	0	1	13	2	11
25	Driver (Heavy Vehicle)	0	0	0	2	1	1	0	0	0	0	0	0	1	0	1	1	1	0	0	0	0	4	2	2
26	Office Subordinate	2	1	1	11	10	1	7	5	2	9	5	4	12	6	6	1	0	1	0	0	0	42	27	15
27	Office Watcher/Night Watchman/Tappal Watcher	1	0	1	3	1	2	4	2	2	4	2	2	4	1	3	0	0	0	0	0	0	16	6	10
28	Depot Watcher	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	0	0	0	0	0	0	2	1	1
29	Thanedar	0	0	0	3	0	3	0	0	0	3	0	3	4	1	3	0	0	0	0	0	0	10	1	9
30	Jamedar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1	0
31	Cleaner	0	0	0	2	0	2	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	3	0	3
32	Gardener	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1

Sl. NO	Name of the Cadre	O/o FDPT CIRCLE NANDYAL (09150402001)			DD, PT, ATAMAKUR (09050402001)			DD, PT MARKAPUR (07090403003)			DD PT GIDDALUR (07060402001)			DFO, NANDYAL (09120402001)			DFO, FSD ATMAKUR (09050402002)			ACF BIODIVERSITY, SRISAILAM (09150402002)			TOTAL		
		S	W	V	S	W	V	S	W	V	S	W	V	S	W	V	S	W	V	S	W	V	S	W	V
	Total	**17**	**9**	**8**	**210**	**93**	**117**	**273**	**91**	**182**	**169**	**58**	**111**	**264**	**117**	**147**	**12**	**5**	**7**	**4**	**1**	**3**	**949**	**374**	**575**

Outsourcing staff:-

Sl. No.	Scheme	Category	No. of persons working *(In Tiger Reserve area only)*						Total
			DD PT Atmakur	DD PT Markapur	DD PT Giddalur	DFO Nandyal	ACF Biodiversity	DFO FSD Atmakur	
1	APTCF	Anti Poaching Protection watchers (each base camp 5 Nos)	130	130	45	40	0	0	**345**
2		River Party Protection watchers (Srisailam upper stream)	5	0	0	0	0	0	**5**
3		Strike Force (Istamakeswari – Nakkanti)	0	5	0	0	0	0	**5**
4		Drivers	10	2	1	0	0	0	**13**
5		Swachh sevaks	31	27	14	13	0	0	**85**
6		Record Assistant/Cashier (EMC Check posts)	9	16	3	2			**30**
7		Check Post helpers(EMC Check Posts)	30	40	6	6	0	0	**82**
8		Veterinary Doctors	2	0	0	0	0	0	**2**
9		Snake rescuer	1	0	0	0	0	0	**1**
10		Supervisors at CBET	1	1	0	1	0	0	**3**
11		Asst. Superiors CBET	1	1	0	0	0	0	**2**
12		Guide at Jungle Safari	1	1	0	0	0	0	**2**
13		Manpower Support CBET	14	5	0	12	0	0	**31**
14		Drivers for Jungle Safari	3	2	0	3	0	0	**8**
15		Supporting Staff for Nekkanti Ride	0	8	0	0	0	0	**8**
16		DEO –Ticket counter (Nekkanti Jungle Ride)	0	1	0	0	0	0	**1**
17		Designer in NSTR	0	1	0	0	0	0	**1**

Sl. No.	Scheme	Category	No. of persons working *(In Tiger Reserve area only)*						Total
			DD PT Atmakur	DD PT Markapur	DD PT Giddalur	DFO Nandyal	ACF Biodiversity	DFO FSD Atmakur	
18		Biologist (Phase –IV)	0	1	0	0	0	0	**1**
19		Data Processing Officer	2	0	1	1	2	0	**6**
20		Data Entry Operators	0	2	1	0	0	1	**4**
21		Non-Technical Assistant	2	2	1	0	0	0	**5**
22		Tech Assistant (Skilled)	0	1	0	0	0	0	**1**
23		Supporting staff for FD Office	2	0	0	0	0	0	**2**
24		Office Subordinate / Night Watchmen / Supporting staff for FRH	6	4	1	0	0	1	**12**
25		EEC supporting staff	3	0	0	0	0	0	**3**
		Total:	**253**	**250**	**73**	**78**	**2**	**2**	**658**

Sl. No.	Scheme	Category	No. of persons working *(In Tiger Reserve area only)*						Total
			DD PT Atmakur	DD PT Markapur	DD PT Giddalur	DFO Nandyal	ACF Biodiversity	DFO FSD Atmakur	
26	CAMPA	Anti-Poaching Protection watchers (each base camp 5 Nos)	0	0	5	10	0	0	**15**
27		Strike Force (Each Strike Force 5 Nos.)	10	20	5	5	0	0	**40**
28		Drivers	5	6	6	9	1	1	**28**
29		Wildlife Protection Rescue Parties (Each WPRP 5 Nos.)	15	10	5	5	0	0	**35**
30		River Party Protection watchers	5	8	0	0	0	0	**13**
31		Care taker for Sniffer Dog	0	1	0	0		0	**1**
32		Anti-Poaching and Rescue Squad	0	2	6	6	0	0	**14**
33		Check Post helpers	6	2	4	4	0	0	**16**
		Total:	41	49	31	39	1	1	**162**

34	BIOSAP	Animal Care taker	2	0	0	0	0	0	**2**
35		Care taker for Sniffer Dog	0	0	0	1	0	0	**1**
36		Snake rescuer	1	1	0	0	0	0	**2**
37		Data Entry Operators for Mstirpes	0	0	0	0	1	0	**1**
38		Field Assistant	0	0	0	0	14	0	**14**
39		Driver for Anti-Poaching Squad	0	0	1	0	0	0	**1**
		Total:	3	1	1	1	15	0	**21**
		Grand total:	**297**	**300**	**105**	**118**	**18**	**3**	**841**

ANNEXURE XII
Regulation of Traffic during prohibitive hours on the Hyderabad Srisailam – Dornal Highway passing through NSTR

Regulation of Traffic during prohibitive hours

REGISTERED NO. M – 1977

Kurnool District Gazette

EXTRODINERY

PUBLISHED UNDER THE AUTHORITY

No. 3 :	**Kurnool, Year: 1988, Month: March, Date:31st, No: 2B**

NOTICE

Under the powers vested with the Chief Wild Life Warden, Andhra Pradesh, Hyderabad through Section 33 of Indian Wild Life (Protection) Act 1972 the Chief Wild Life Warden, Government of Andhra Pradesh, Hyderabad desires to restrict the movement of all vehicular traffic on the Hyderabad – Srisailam – Dornal Highway, passing through the Nagarjuna Sagar Srisailam Tiger Reserve starting at the Mannanur and ending at Dornal from 15th May 1988, onwards in between hours 9.00 PM to 6.00 AM every day.

However, these restrictions are relaxed in case of Government officials moving on emergent official duties, who shall move so with the written permission of the Assistant Director, Atmakur (Kurnool District) / Achampet (Mahaboob Nagar District) of the Tiger Reserve.

All vehicles will be stopped for night halt at Mannanur (Mahaboob Nagar District) & Dornal (Prakasam District) in between the above specified hours.

Any appeals against these restrictions may be made to the Chief Wild Life Warden, Andhra Pradesh, Hyderabad before 31st March ' 1988.

Sd/-
K. JAGANMOHAN RAO,
Field Director,
Project Tiger, Srisailam.

ANNEXURE XIII
NSTR - Collection of Environmental maintenance Charges for the Vehicles passing through Tiger Reserve areas

GOVERNMENT OF ANDHRA PRADESH
ABSTRACT

Wildlife – Forest Department – NSTR – Collection of Environmental maintenance Charges for the Vehicles passing through Tiger Reserve areas – Permission accorded – Orders – Issued.

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ENVIRONMENT, FORESTS, SCIENCE & TECHNLOGY (FOR.II) DEPARTMENT

G.O.Ms. No. 56 Date:28-05-2014.

Read the following:

1) From the PCCF (WL) & CWLW,A.P., Hyd. Rc.No:11566/2013/ WL-1, Dated:11.12.2013.
2) From the PCCF(WL) & CWLW, A.P., Hyd,Lr.Rc.No.11566/2013/ WL-1, Dated:22.03.2014

* * * * *

O R D E R:

In the reference 1st read above, the Principal Chief Conservator of Forests (Wildlife) & Chief Wildlife Warden, A.P., Hyderabad has informed that the road from Hyderabad to Srisailam and Guntur / Kurnool to Srisailam passes through the core area of Nagarjunasagar Srisailam Tiger Reserve, the entry point being Mannanur from Hyderabad side and Dornala from the other side. The traffic is prohibited on this road from 9.00 P.M. to 6.00 A.M. and during non-prohibited hours lot of tourists / Pilgrims pass through these roads in different type of vehicles on their way to Srisailam temple. During festival times the numbers of vehicles passing through these roads becomes very high and due to use of the roads by such large number of vehicles and pilgrims a lot of litter and garbage is generated on the road sides which is very harmful to the health of the wildlife. Instances of plastic bags containing food articles dispensed by the tourists and ingested by the wild herbivores and these plastic bags getting lodged in the rumen of these animals and becoming fatal have been noticed. Due to heavy accumulation of such litter and garbage it is becoming very difficult to clean litter and garbage on day to day basis as sufficient monetary resource is not available for engaging people for the cleaning work and it is desirable to keep the core area totally litter and garbage free for conservation of wildlife. In view of the above, it is proposed to collect Environmental maintenance charges for the vehicles passes through R&B roads falling in Nagarjunasagar Srisailam Tiger Reserve i.e., Guntur / Kurnool – Srisailam Road and Hyderabad – Srisailam for the improvement of habitat at the rate of Rs.20/- per heavy vehicle (Buses and Lorries) and Rs. 10/- per light vehicle (Toofans, Tempos, Cars and Vans), except for all Government Vehicles and APSRTC and vehicles of other State Government owned corporation as the Chief Wildlife Warden is Empowered to impose such collection as per Section-28(2) and Section - 33(c) of the Wildlife (Protection) Act, 1972.

2. In the reference 2nd read above, the Principal Chief Conservator of Forests (Wildlife) & Chief Wildlife Warden, A.P., Hyderabad has stated that the proposal is being made to control the adverse impact of the vehicular traffic in the core area of the Tiger Reserve and to take up certain measures like deploying mobile patrol parties to keep check on speeding vehicles, clearance and disposal of litter along the highway, setting up of speed breakers to avoid accidents to wild animals crossing the roads, putting up sign boards and caution boards to maintain speed limit. These activities will be taken up with the proposed fee collected from various vehicles passing through the Tiger Reserve and the amount so collected will be deposited in Tiger Conservation Foundation of Andhra Prades which was registered with the Registrar of Societies, Nandyal and accounting procedure and guidelines will be followed as provided in the Bylaws of Tiger Conservation Foundation.

3. The Principal Chief Conservator of Forests (Wildlife) & Chief Wildlife Warden, A.P., Hyderabad has therefore requested the Government to consider collection of Environmental maintenance Charges from 1st April, 2014, at the rate of Rs.20/- per heavy vehicle (Buses and Lorries) and Rs. 10/- per light vehicle (Toofans, Tempos, Cars and Vans), except for all belonging to Government, APSRTC and vehicles of other State Governments and Government owned Corporations.

4. Government, after careful examination of the proposal of the Principal Chief Conservator of Forests (Wildlife) & Chief Wildlife Warden, A.P., Hyderabad, hereby accord permission to Levy Environmental maintenance charges for the vehicles passing through Nagarjunasagar Srisailam Tiger Reserve at the rate of Rs.20/- per heavy vehicle (Buses and Lorries) and Rs. 10/- per light vehicle (Toofans, Tempos, Cars and Vans), except for all belonging to Government APSRTC and vehicles of other State Government and Government owned corporations.

5. The Principal Chief Conservator of Forests (Wildlife) & Chief Wildlife Warden, A.P. Hyderabad shall take further necessary action accordingly. This order comes into force with effect from the date of issue.

6. The orders are issued with the concurrence of Finance (Expr. M&F) Department vide their U.O.No.11316-J/91/A2/Expr.M&F/14, Dt.26.05.2014.

(BY ORDER AND IN THE NAME OF THE GOVERNOR OF ANDHRA PRADESH)

D. LAKSHMI PARTHASARATHY BHASKAR
SPECIAL CHIEF SECRETARY TO GOVERNMENT

To
The Principal Chief Conservator of Forests (WL) &
Chief Wildlife Warden, A.P. Hyderabad.

Copy to:-
PS to Governor to Advisor
PS to CS
PS to Spl.CS, EFS&T Dept.
The Finance (Expr. M&F) Dept.

//FORWARDED :: BY ORDER//

SECTION OFFICER

ANNEXURE XIV

Constitution of a Committee to study the issues and initiate concrete measures to avoid Man-Animal Conflict over improper disposal of garbage and indiscriminate usage, disposal of plastic bottles and polythene bags by the pilgrims and local residents all along the main roads in Srisailam area and also improper maintenance of dump yard at Srisailam

GOVERNMENT OF ANDHRA PRADESH
ABSTRACT

Environment, Forests, Science & Technology Department – Constitution of a Committee to study the issues and initiate concrete measures to avoid Man-Animal Conflict over improper disposal of garbage and indiscriminate usage, disposal of plastic bottles and polythene bags by the pilgrims and local residents all along the main roads in Srisailam area and also improper maintenance of dump yard at Srisailam - Orders – Issued.

ENVIRONMENT, FORESTS, SCIENCE & TECHNOLOGY (SEC.II) DEPARTMENT

G.O.Ms.No.11 **Dated:06.02.2024.**

Read the following:-

1. From the PCCF (WL) & Chief Wildlife Warden, A.P., Mangalagiri, letter Rc.No.21/38/2023/WL-3, dated 29.09.2023.
2. Memo.No.2294/Section.II/2023/2233496, E.F.S. & T. (Sec.II) Department, dated 17.10.2023.
3. From the PCCF & HoFF, A.P., Mangalagiri letter Rc.No.21/158/2023/WL-3, dated 05.12.2023.

*****

ORDER:

In the letter 3rd read above, the Principal Chief Conservator of Forests & Head of Forest Force, Andhra Pradesh, Mangalagiri has submitted a proposal for constitution of the Committee, to study the issues and initiate concrete measures to avoid Man-Animal Conflict, in the wake of improper disposal of garbage and indiscriminate usage, disposal of plastic bottles and polythene bags by the pilgrims and local residents all along the main roads in Srisailam area and also improper maintenance of dump yard at Srisailam.

2. After careful examination of the proposal, the Government hereby constitute a Committee with the following composition, to study the issues and initiate concrete measures to avoid Man-Animal conflict over improper disposal of garbage and indiscriminate usage, disposal of plastic bottles and polythene bags by the pilgrims and local residents all along the main roads in Srisailam area and also improper maintenance of dump yard at Srisailam:-

Sl.No.	Name of the Designatory	Designation
1	Conservator of Forests & Field Director, Project Tiger, Nandyal	Chairman
2	Deputy Director, Project Tiger, Atmakur	Member Secretary/ Member Convener.
3	Deputy Director, Project Tiger, Markapur	Member
4	Divisional forest Officer, Flying Squad Division, Atmakur	Member
5	Sri Avula Venkata Narayana Reddy, Honorary District Wildlife Warden, Nandyal	Member
6	Deputy Collector & Executive Officer, Srisailam Devasthanam, Srisailam	Member
7	Revenue Divisional Officer, Atmakur	Member
8	Assistant Director, Veterinary Area Hospital, Atmakur	Member
9	Mr.Imran Siddhiqui, HYTICOS, Hyderabad	Member

[P.T.O]

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3. The Principal Chief Conservator of Forests & Head of Forest Force, Andhra Pradesh, Mangalagiri, shall take necessary action in the matter accordingly.

(BY ORDER AND IN THE NAME OF THE GOVERNOR OF ANDHRA PRADESH)

NEERABH KUMAR PRASAD
SPECIAL CHIEF SECRETARY TO GOVERNMENT

To
The Principal Chief Conservator of Forests &
Head of Forest Force, A.P., Mangalagiri.
All the Members through PCCF & HoFF, A.P., Mangalagiri.

Copy to:

The PS to Hon'ble Minister (E, E. F. S. & T., M & G).
The PS to Spl.CS to Govt., E.F.S. & T. Department.

//FORWARDED :: BY ORDER//

SECTION OFFICER