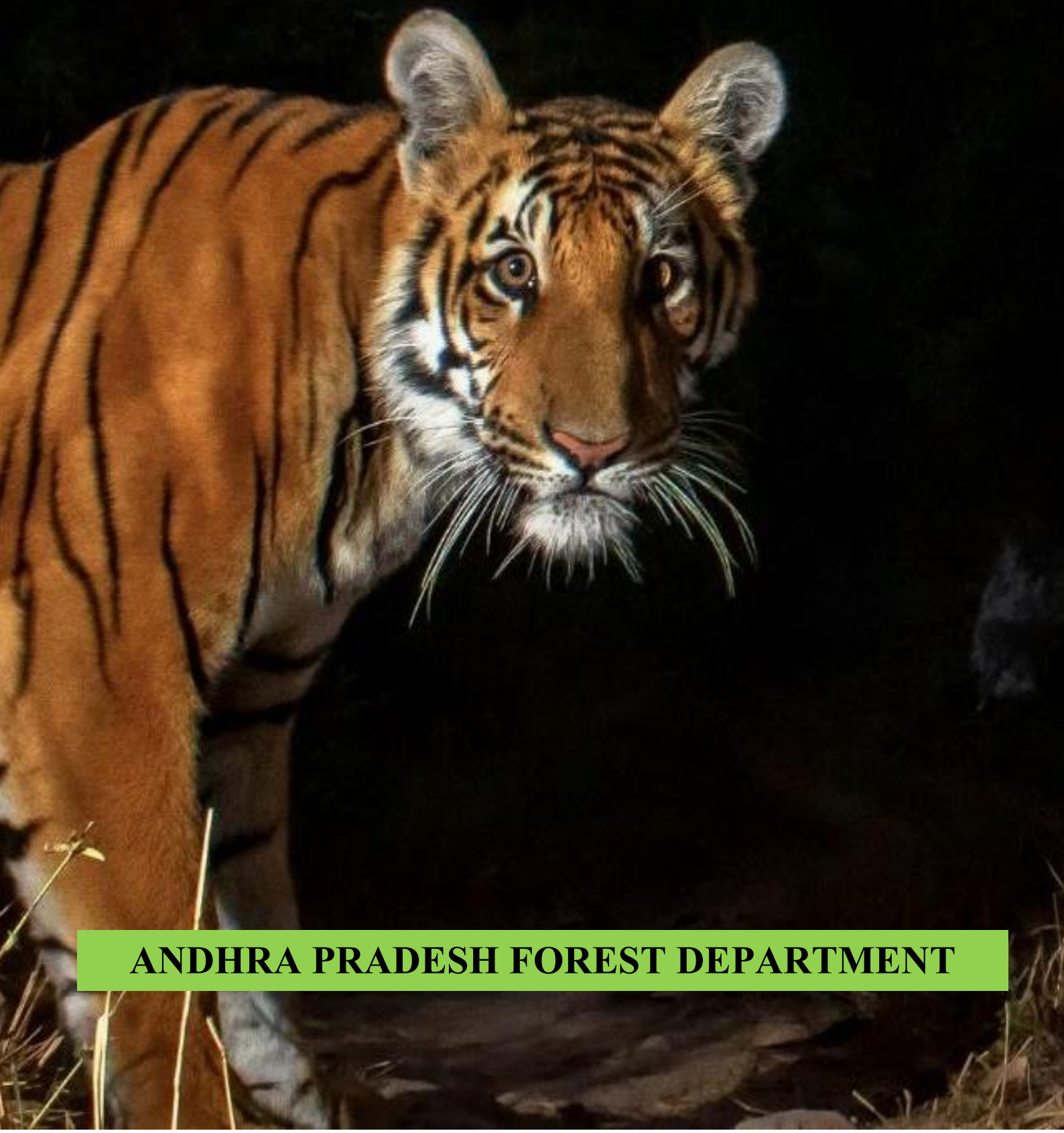
TIGER CONSERVATION PLAN
NAGARJUNASAGAR SRISAILAM TIGER RESERVE
(2023-24 to 2032-33)

VOLUME II
BUFFER 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
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
Ha	Hectare
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, Forests and Climate Change
MoU	Memorandum of Understanding
MM	Millimetres
MSL	Mean Sea Level
NHAI	National Highways Authority of India
NSTR	Nagarjunasagar Srisailam Tiger Reserve
PA	Protected Area
PCCF	Principal Chief Conservator of Forests
PF	Protected Forests
RF	Reserve 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

Acknowledgment

I would like to extend my sincere gratitude to Sri Chiranjiv Choudhary, IFS, Principal Chief Conservator of Forests and Head of Forest Force, Andhra Pradesh and Sri Ajaya Kumar Naik, IFS, Principal Chief Conservator of Forests (Wildlife) & Chief Wildlife Warden for entrusting me the task to prepare the Tiger Conservation Plan for Nagarjunasagar Srisailam Tiger Reserve (2023-24 to 2032-33). I would also like to thank, Sri P.V. Chalathi Rao, IFS, Prl. Chief Conservator of Forests & HoFF and Prl. Chief Conservator of Forests (WL) & Chief Wildlife Warden, A.P, Mangalagiri during the revision, Dr. Shanti Priya Pandey, IFS, Addl. Principal Chief Conservator of Forests (Wildlife) for her support. I would also acknowledge the efforts of Deputy Directors, Project Tiger, Sri. Alan Chong Teron, IFS, PT, Atmakur, Sri. Vignesh Appavu G, IFS, PT, Markapur, Sri. Y.V. Narasimha Rao, DyCF/DD, PT, Giddalur, Sri. Anurag Meena, IFS, DD, PT, Nandyal, Sri. P. Dhana Raj, SFS., ACF, Biodiversity, PT Circle in successful drafting of Tiger Conservation Plan.

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I am grateful to Sri. Rakesh Kalva, Wildlife Biologist and Sri Imran Siddiqui, HyTiCoS for their support and inputs in preparation of this plan.

I also greatly acknowledge the efforts of all Forest Range Officers of NSTR who play a pivotal role in implementation of Tiger Conservation Plan. The inputs from the field staff have immensely contributed in writing a meaningful and a more practical Tiger Conservation Plan.

Last but not the least, I would like to thank my Project Tiger Circle and Division office staff for all the support for compilation of required data which helped us in preparation of this plan.

B. Vijaya Kumar, IFS.,
Chief Conservator of Forests & Field Director,
NSTR, Project Tiger Circle, Nandyal.

EXECUTIVE SUMMARY: BUFFER AREA

The Management Plan is for a period of 10 years from 2024-2034. As per section 38V (4) (ii) of the Wildlife (Protection) Amendment Act – 2006, each Tiger Reserve is required to create a Buffer area consisting of areas peripheral to critical tiger habitat or core area. While the critical habitat is supposed to be kept inviolate for conservation, a buffer zone is needed to ensure the integrity of the habitat with adequate space for dispersal of tigers. It is aimed at promoting co-existence between wildlife and human activity.

The notified Buffer area of NSTR is 730.49 Km^2 notified vide G.O.Ms.No. 54, EFS&T, (FOR.II), Dept, Dt. 27-07-2012. Given that the tiger numbers have increased in the core area and based on tiger monitoring, there is frequent movement and also resident tiger identified in the surrounding landscape. Keeping this in view an additional 1,803.98 Km^2 is proposed to be added as buffer, spreaded over Nandyal (Project Tiger, Atmakur & Nandyal), Prakasam District (Project Tiger Markapur & Giddalur). As per the National level tiger Assessment report published by NTCA and WII in 2022, the estimated tiger population is in the range of 58-70 tigers in the tiger reserve.

The key threats in the buffer area are heavy dependence on NTFP, fire and poaching. Apart from that, the presence of numerous temples also adds to the biotic pressure. Proximity to human habitation and various development activities further degrade and fragment the habitat. Given the number of tigers and the threats to the landscape, the vision for the management of the buffer area of NSTR is: 'Conservation of the natural habitat to supplement the spillover tiger populations and their prey by mainstreaming wildlife concerns in key production sectors, in coordination with local communities and other government agencies/line departments.

With this vision in mind, the key management strategies of buffer area would be:

1. Strengthening and Effective Management of Buffer Area by improving the infrastructure and human resources.
2. Steps towards habitat improvement and habitat connectivity to be taken limited to promote migration.
3. Controlling forest fires and extraction of forest resource to be minimized.

4. Special focus towards mainstreaming tiger conservation into district planning and line departments (agriculture, rural development, energy, tribal welfare etc.).
5. Adequate measures for mitigating the impact of linear infrastructure projects to be taken up.
6. Community Based Eco-tourism activities in the buffer zone of Tiger Reserve to be encouraged as a component of eco-development activity, eliciting the active involvement of stakeholder communities.
7. Capacity building of frontline staff as well as Eco-development Committee members should be undertaken on a regular basis.
8. Rigorous research to be undertaken to monitor the tigers and its prey.
9. Special focus is also drawn towards setting up elephant camps at five locations in the buffer area. Given that there might be increased conflict in the buffer area two Wildlife Transit Treatment Centers are proposed in the buffer area carefully avoiding any tiger corridors.
10. A buffer area coordination committee is also proposed to be setup to review protection and other related issues in the buffer. Apart from the committee the plan also details on coordination with various other departments.

The buffer plan has been prepared with the future of the tigers in mind. All measures that could hamper their movement and dispersal have been addressed in the plan, ranging from forest resource extraction to large-scale road projects. These actions have been undertaken with a clear vision for the plan and the long-term goal of tiger conservation in the country.

TIGER CONSERVATION PLAN: BUFFER 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, have viable tiger population consisting mainly of tropical dry deciduous forests.
- The Reserve is strategically located in Central India, connected in the south to the Seshachalam hill ranges and in the northwest to the northeast side to the Amrabad Tiger Reserve.
- The habitat of NSTR is highly productive in context of tiger. 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, Annamayya and Tirupati 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 to address human-tiger conflicts.
- Restoring the corridor connections with Seshachalam hill ranges passing through Nallamalais, Kancherlamorum, Lankamalais, 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 NSTR is divided into 2 halves and this plan pertains to the state of Andhra Pradesh. The Management Plan for Nagarjunasagar Srisailam Tiger Reserve (hereafter referred to as NSTR) covers the 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, Forests & Climate Change, Govt. of India have issued detailed guidelines for the preparation of Tiger Conservation Plan. Based on these guidelines, this Tiger Conservation Plan covers an area of 5442.83 Sq.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 Area of the state, consisting of sizeable number of Tigers. The total area of the Rajiv Gandhi Wildlife Sanctuary and Gundla Brahmeswaram Wildlife Sanctuary 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 intervention. The Buffer/peripheral areas are Tiger bearing forests, having potential for further consolidation. These areas are required to provide supplement habitat 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 bearer of 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 where the residual areas of NSTR have been re-notified as Amrabad Tiger Reserve.

The Core of NSTR is spreaded 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 spreaded over an area of 2534.47 Sq. Km. 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.

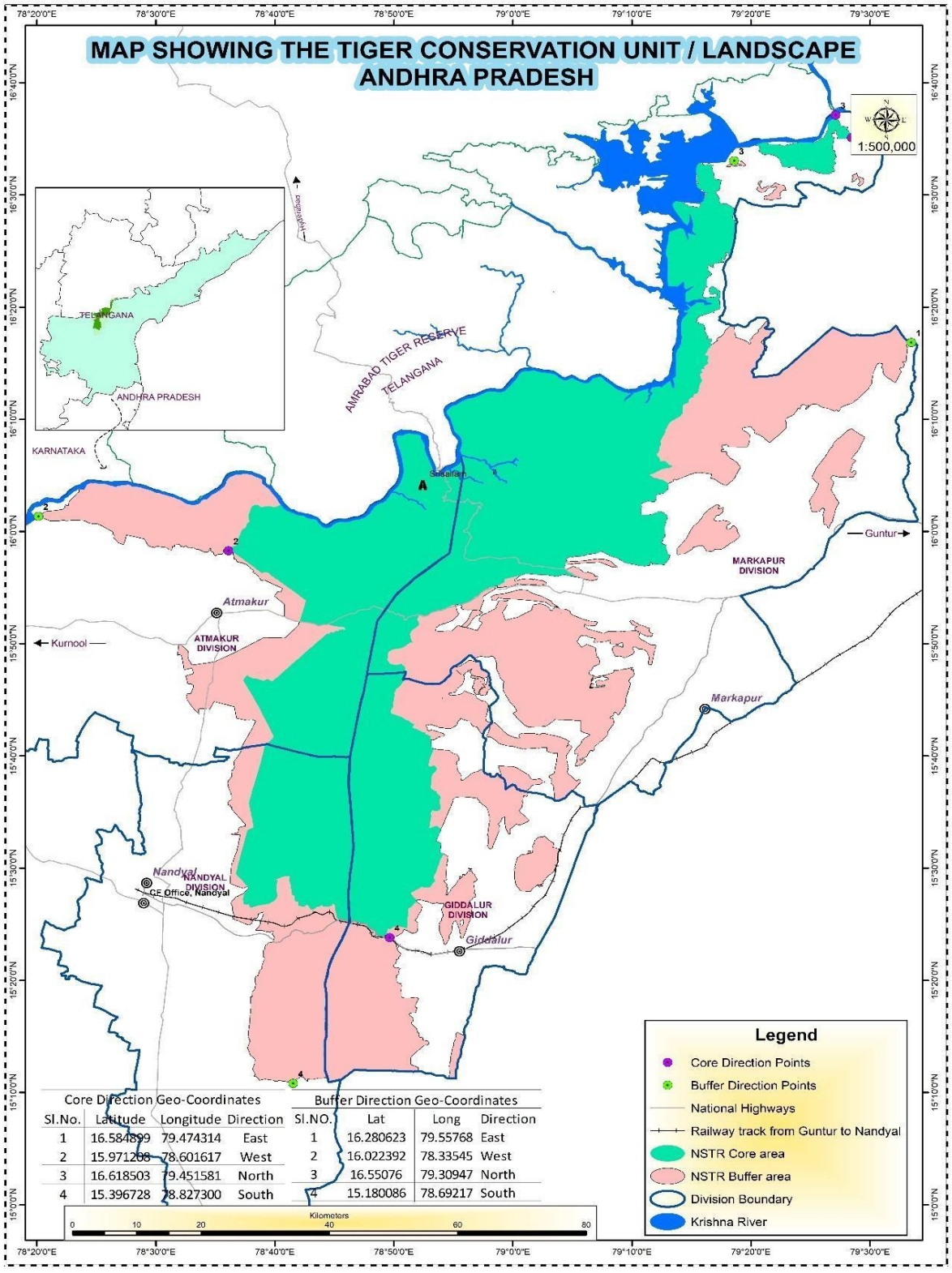
Accordingly, the notification proposals of NSTR Core & Buffer have been submitted to the Government vide Prl. CCF (WL) & CWLW, A.P., Mangalagiri Rc.no.3030/2023/WL-2 Dated 05.07.2023.

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 is as follows:-

Sl. No	Division	Existing NSTR Area (Sq. km)				Proposed NSTR Area (Sq. km)		
		Core	Buffer	Buffer (Within Sanctuary)	Total (3+4)	Core	Buffer	Total (6+7)
1	2	3	4	5	6	7	8	9
1	PT Markapur	976.08	414.96	552.87	2918.99	1315.98	1063.27	2379.25
2	PT Atmakur	659.55	315.53			783.86	464.85	1248.71
3	PT Giddalur	390.225	0	0	390.225	390.23	614.33	1004.56
4	PT Nandyal	418.29	0	0	418.29	418.29	392.01	810.3
	Total	**2444.14**	**1283.68**	**552.87**	**3727.82**	**2908.36**	**2534.47**	**5442.83**

Map 1 – Map showing Tiger Conservation Unit / Landscape

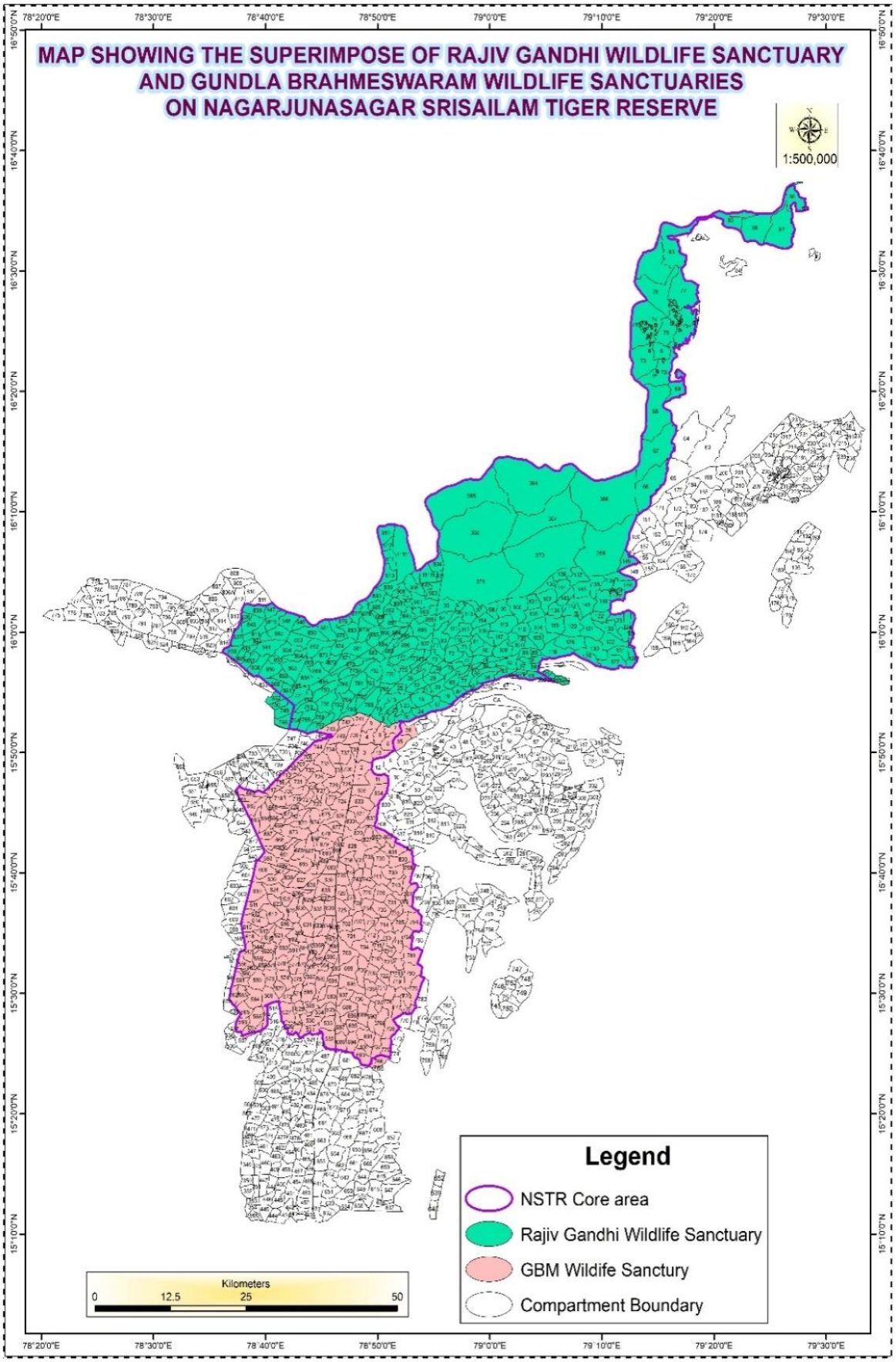


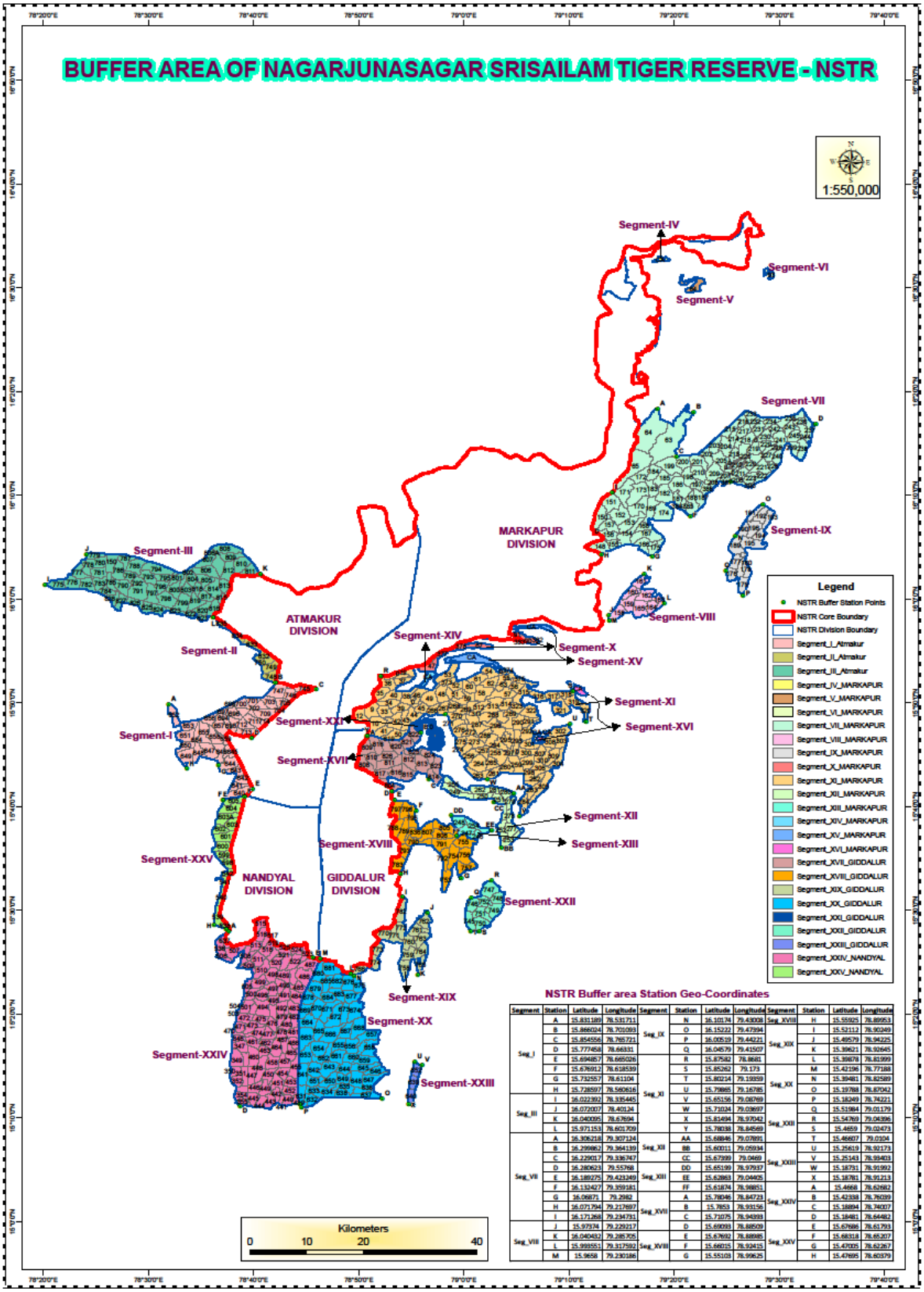
Core Direction Geo-Coordinates

Sl.No.	Latitude	Longitude	Direction
1	16.584899	79.474314	East
2	15.971268	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 SHOWING THE SUPERIMPOSE OF RAJIV GANDHI WILDLIFE SANCTUARY
AND GUNDLA BRAHMESWARAM WILDLIFE SANCTUARIES
ON NAGARJUNASAGAR SRISAILAM TIGER RESERVE
1:500,000
Legend
NSTR Core area
Rajiv Gandhi Wildlife Sanctuary
GBM Wildife Sanctury
Compartment Boundary
Kilometers
0
12.5
25
50
78°20'0"E
78°30'0"E
78°40'0"E
78°50'0"E
79°0'0"E
79°10'0"E
79°20'0"E
79°30'0"E
16°50'0"N
16°40'0"N
16°30'0"N
16°20'0"N
16°10'0"N
16°0'0"N
15°50'0"N
15°40'0"N
15°30'0"N
15°20'0"N
15°10'0"N



NSTR Buffer area Station Geo-Coordinates

Segment	Station	Latitude	Longitude	Segment	Station	Latitude	Longitude	Segment	Station	Latitude	Longitude
Seg_I	A	15.831189	78.531711	Seg_IX	N	16.10174	79.43008	Seg_XVIII	H	15.55925	78.89953
	B	15.866024	78.701093		O	16.15222	79.47394		I	15.52112	78.90249
	C	15.854556	78.765721		P	16.00519	79.44221	Seg_XIX	J	15.49579	78.94225
	D	15.777458	78.66331		Q	16.04579	79.41507		K	15.39621	78.92645
	E	15.694857	78.665026	Seg_XI	R	15.87582	78.8681		L	15.39878	78.81999
	F	15.676912	78.618539		S	15.85262	79.173		M	15.42196	78.77188
	G	15.732557	78.61104		T	15.80214	79.19359	Seg_XX	N	15.39481	78.82589
	H	15.728597	78.580616		U	15.75865	79.16785		O	15.39788	78.87042
Seg_III	I	16.022392	78.335445		V	15.65156	79.08769		P	15.38249	78.74221
	J	16.072007	78.40124		W	15.71024	79.03697		Q	15.51984	79.01179
	K	16.040095	78.67694		X	15.81494	78.97042	Seg_XXII	R	15.54769	79.04396
	L	15.971153	78.601709		Y	15.78038	78.84569		S	15.4659	79.02473
Seg_VII	A	16.306218	79.307124		AA	15.68846	79.07691		T	15.46607	79.0104
	B	16.299862	79.364139	Seg_XII	BB	15.60011	79.05934		U	15.25619	78.92173
	C	16.229017	79.336747		CC	15.67369	79.0469	Seg_XXIII	V	15.25143	78.99403
	D	16.280623	79.55768		DD	15.65189	78.97937		W	15.18751	78.91992
	E	16.189275	79.423249	Seg_XIII	EE	15.62863	79.04405		X	15.18761	78.91213
	F	16.132427	79.359181		FF	15.61874	78.98851		A	15.4668	78.62682
	G	16.06871	79.2982		A	15.78046	78.84723	Seg_XXIV	B	15.42338	78.78039
	H	16.071794	79.217897	Seg_XVII	B	15.7853	78.93156		C	15.18894	78.74007
	I	16.171268	79.234731		C	15.71075	78.94393		D	15.18481	78.64482
Seg_VIII	J	15.97374	79.229217		D	15.69093	78.88509		E	15.67686	78.61793
	K	16.040432	79.285705		E	15.67692	78.88985	Seg_XXV	F	15.68318	78.65207
	L	15.993551	79.317592	Seg_XVIII	F	15.66015	78.92415		G	15.47035	78.62267
	M	15.9658	79.230186		G	15.55103	78.99625		H	15.47695	78.60379

C. 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 (No.18 of 2022), a separate Chapter (IVB) has been added on the "National Tiger Conservation Authority". This Chapter, *inter alia*, has enabling provisions (Section 38V) for preparing a "Tiger Conservation Plan" for the proper management of a Tiger Reserve, which will 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.

D. Adjoining Landscape:

The NSTR has connectivity on both its northern and southern sides. The northwestern to northeastern side connects it to the Amrabad Tiger Reserve in the State of Telangana, which has substantial tiger population, while the southern side connects it to the Seshachalam Hills enroute to the Nallamala, Kancherlamorum, Lankamalais, Veligondas, and Palakonda hill ranges. The corridor also includes other protected areas of the Lankamalleswara and Penusula Wildlife Sanctuaries. The Nandyal, Cuddapah, Nellore, Annamayya and Tirupati divisions have been included as part of the adjoining landscape.

II. APPROACH TO TIGER CONSERVATION PLANNING:

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 have 1. Consolidation and strengthening the "source population" in the tiger reserve and protected areas 2. Managing "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 – 1
Introduction of the Area



Introduction of the Area:-

- The National Tiger Conservation Authority (NTCA), Government of India has issued instructions (NTCA Lr.No.1501/2011/2007-PT, (part) Dated. 16.1.2007) for delineation of Buffer / peripheral area in consultation with the concerned Grama Sabhas and the expert committee, under section 38 V of the Wildlife (Protection) Act, 1972.
- Accordingly, the Divisional Forest Officers (DFO) / DDs conducted Grama Sabhas in this regard and submitted Grama Sabha Resolutions. The Grama Sabha have not expressed any objections for declaration of buffer area.
- The Expert Committee has gone through the details of households, cattle prey, the presence of Tigers in recent past, in the proposed buffer area to find out the suitability of the areas for the constitution as buffer of NSTR.
- Hence, in the erstwhile united state of Andhra Pradesh, Government notified the area of 1175.5 square kilometer vide G.O.Ms.No. 54, EFS&T, (FOR.II), Dept, Dt 27-07-2012 as buffer area outside the Tiger Reserve out of which an area of 730.49 Km^2 falls in the present state of AP.

1.1 NAME, LOCATION, CONSTITUTION AND EXTENT

1.1.1 NAME

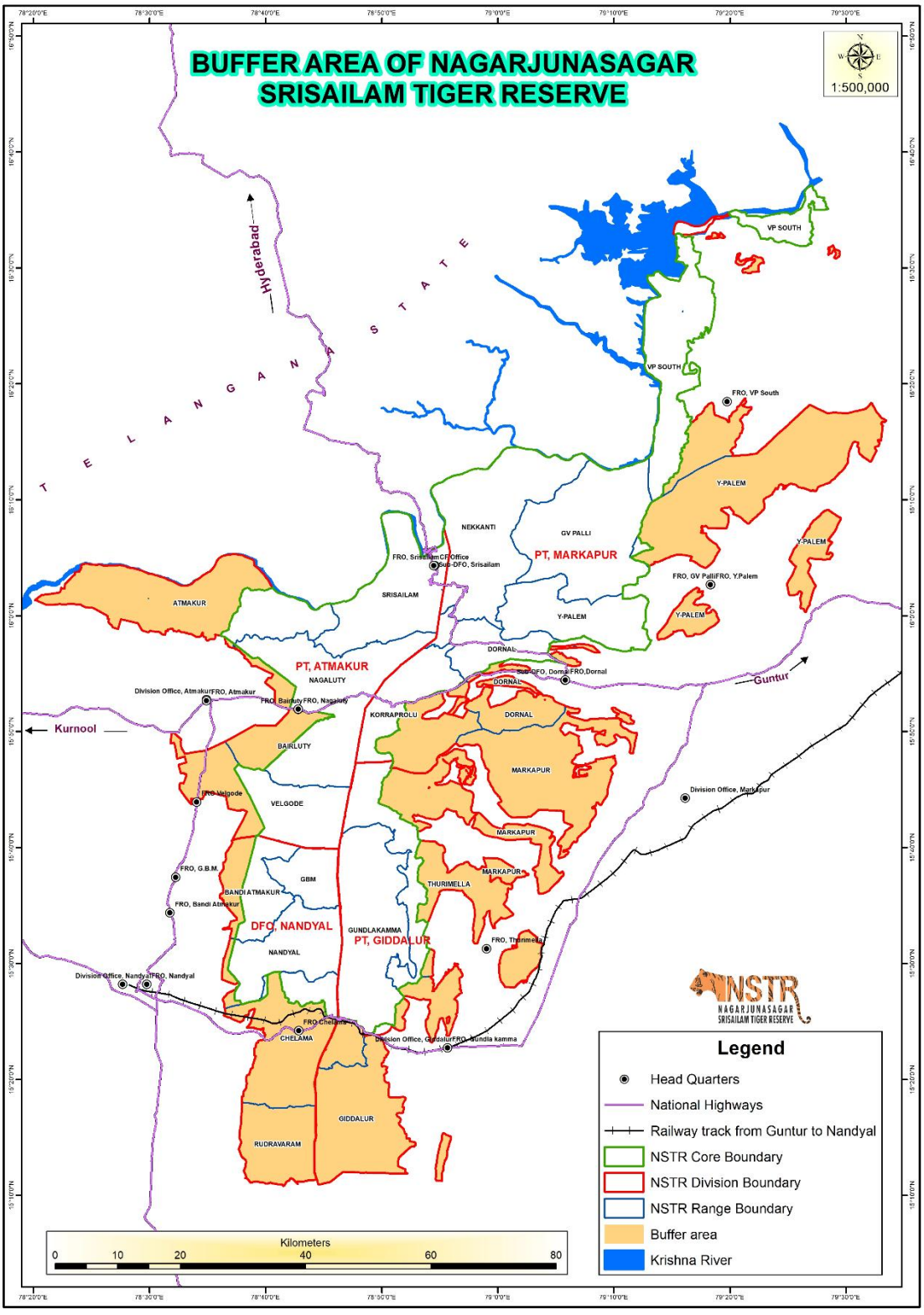
BUFFER AREA

- The Government of Andhra Pradesh notified the area of 1175.5 square kilometer vide G.O.Ms.No. 54, EFS&T, (FOR.II), Dept, Dt 27-07-2012 as buffer area in erstwhile united Andhra Pradesh (earlier NSTR including Telangana) which included buffer area to the extent of 730.49 square kilometers in present Andhra Pradesh. (ANNEXURE I)
- The adjacent reserved forest areas of Rajiv Gandhi Wildlife Sanctuary and GBM Wildlife Sanctuary needs to be notified as buffer to the NSTR as per the Hon'ble Supreme Court of India orders dated 03.04.2012 notifying the core and buffer together.

Table 1 - Area Statement of Buffer Zone of NSTR

Sl. No.	PARTS OF BUFFER ZONE	Area in Km^2
1.	Notified Buffer Zone of NSTR vide G.O.Ms.No. 54, EFS&T, (FOR.II), Dept, Dt. 27-07-2012.	730.49
2.	Proposed Buffer around NSTR (Due to frequent tiger movement)	1803.98
	TOTAL BUFFER AREA (1+2)	**2534.47**

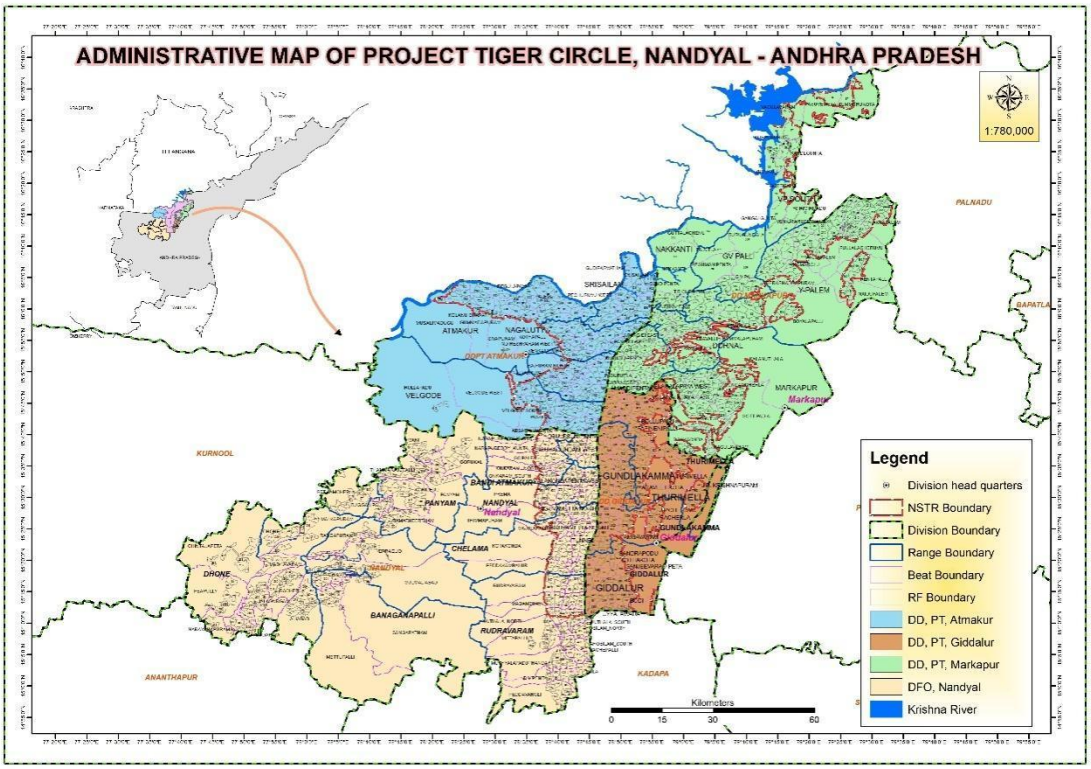
Map 2:– Map showing Buffer area of NSTR



1.1.2 LOCATION:-

It spreads over three districts *viz*., Nandyal, Prakasam and Palnadu in the state of Andhra Pradesh.

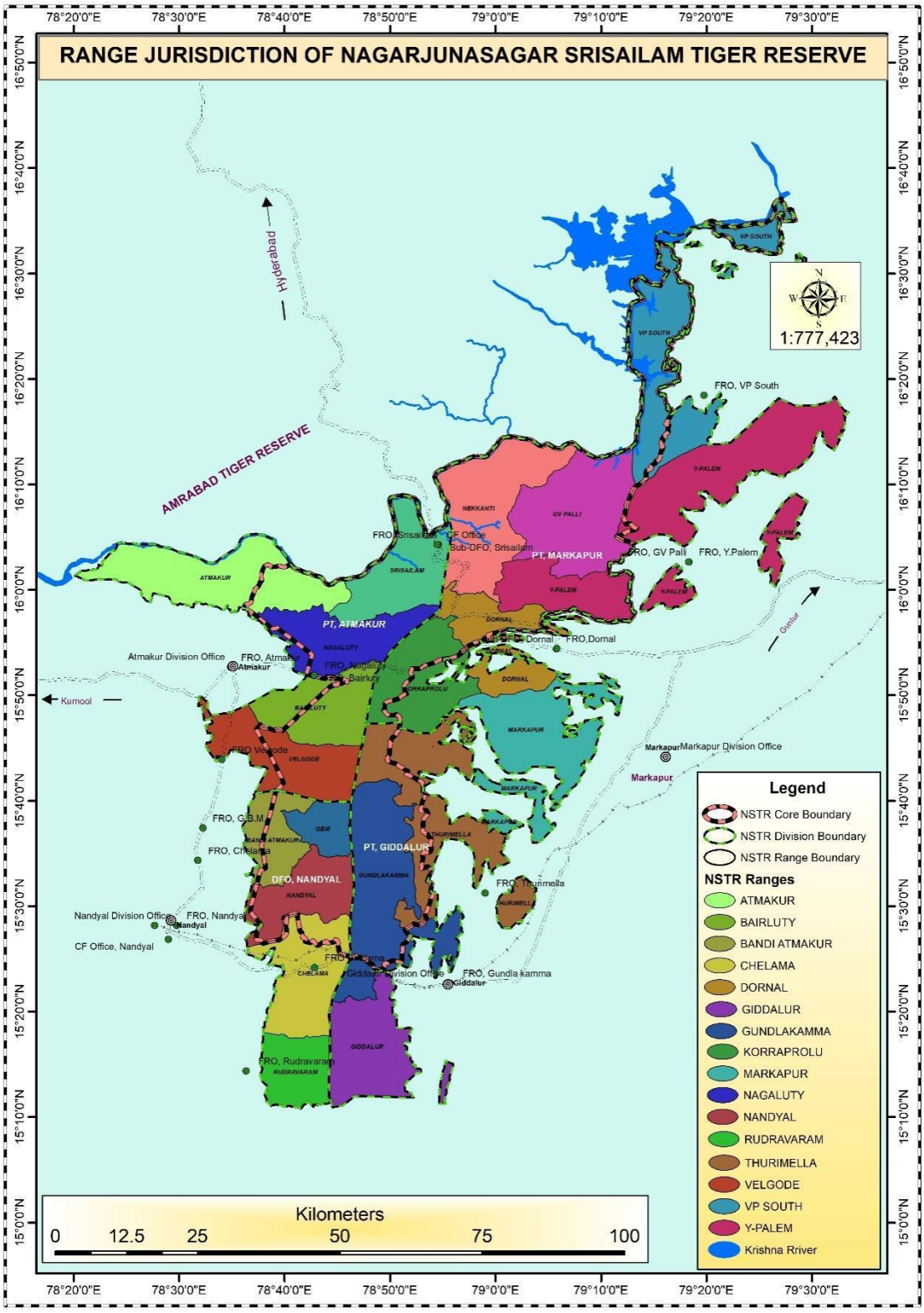
Map 3:– Map showing districts in Buffer area of NSTR



1.1.3. Constitution & Extent

The buffer area is spreaded in 3 districts viz Nandyal (Project Tiger Atmakur & Nandyal Divisions), Prakasam (Project Tiger Markapur & Giddalur Divisions) and Palnadu (Project Tiger Markapur Division) districts.

Map 4:– Map showing Range jurisdiction in Buffer area of NSTR



THE SCHEDULE OF BUFFER AREA :-

Names of the Districts	:	1. Prakasam 2. Palnadu 3. Nandyal
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. Rentachinthala 7. Atmakur 8. Srisailam 9. Kothapalli 10. Pamulapadu 11. Velgodu 12. Bandi Atmakur 13. Mahanandi 14. Sirivella 15. Giddalur 16. Racherla 17. Ardaveedu
Name of the Forest Ranges	:	1. V.P. South 2. Yerragondapalem 3. Dornala 4. Markapur 5. Korraprolu 6. Nagaluty 7. Bairluty 8. Atmakur 9. Velgode 10. Rudravaram 11. Bandi Atmakur 12. Nandyal 13. Chelama 14. Giddalur 15. Turimella 16. Gundlakamma
Buffer / Peripheral area to NSTR	:	2534.46 Sq.Km (or) 253446.68 ha.

Table 2 - Range wise area statement of Buffer Zone of NSTR

Name of Buffer area for Nagarjunasagar Srisailam Tiger Reserve	District	Name of the Forest Division	Name of the Forest Range	Buffer / Peripheral area	
				In Ha	In Sq. Km
Buffer area for Nagarjunasagar Srisailam Tiger Reserve –I	Nandyal	Project Tiger, Atmakur	Bairluty	6245.06	62.45
			Velgode	10083.60	100.84
			Total	**16328.66**	**163.29**
Buffer area for Nagarjunasagar Srisailam Tiger Reserve –II	Nandyal	Project Tiger, Atmakur	Atmakur	73.20	0.73
			Nagaluty	2142.42	21.42
			Total	**2215.62**	**22.16**
Buffer area for Nagarjunasagar Srisailam Tiger Reserve –III	Nandyal	Project Tiger, Atmakur	Atamkur	27941.15	279.41
			Atmakur Division Total	**46485.43**	**464.85**
Buffer area for Nagarjunasagar Srisailam Tiger Reserve –IV	Palnadu	Project Tiger, Markapur	V.P South	2.02	0.02
Buffer area for Nagarjunasagar Srisailam Tiger Reserve –V	Palnadu	Project Tiger, Markapur	V.P South	614.14	6.14
Buffer area for Nagarjunasagar Srisailam Tiger Reserve –VI	Palnadu	Project Tiger, Markapur	V.P South	122.13	1.22
Buffer area for Nagarjunasagar Srisailam Tiger Reserve –VII	Palnadu	Project Tiger, Markapur	V.P South	2989.68	29.90
	Prakasam	Project Tiger, Markapur	Y. Palem	36607.03	366.07
			Total	**39596.71**	**395.97**
Buffer area for Nagarjunasagar Srisailam Tiger Reserve –VIII	Prakasam	Project Tiger, Markapur	Y. Palem	3664.13	36.64
Buffer area for Nagarjunasagar Srisailam Tiger Reserve –IX	Prakasam	Project Tiger, Markapur	Y. Palem	4848.80	48.49
Buffer area for Nagarjunasagar Srisailam Tiger Reserve –X	Prakasam	Project Tiger, Markapur	Dornal	1975.52	19.76
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
			Total	**47213.44**	**472.13**
Buffer area for Nagarjunasagar Srisailam Tiger Reserve –XII	Prakasam	Project Tiger, Markapur	Markapur	4682.96	46.83
Buffer area for Nagarjunasagar Srisailam Tiger Reserve –XIII	Prakasam	Project Tiger, Markapur	Markapur	1377.17	13.77

Buffer area for Nagarjunasagar Srisailam Tiger Reserve –XIV	Prakasam	Project Tiger, Markapur	Korraprolu	283.21	2.83
Name of Buffer area for Nagarjunasagar Srisailam Tiger Reserve	**District**	**Name of the Forest Division**	**Name of the Forest Range**	**Buffer / Peripheral area**	
				In Ha	**In Sq. Km**
Buffer area for Nagarjunasagar Srisailam Tiger Reserve –XV	Prakasam	Project Tiger, Markapur	Dornal	1416.44	14.16
Buffer area for Nagarjunasagar Srisailam Tiger Reserve –XVI	Prakasam	Project Tiger, Markapur	Markapur	530.10	5.30
			Markapur Division Total	**106326.77**	**1063.27**
Buffer area for Nagarjunasagar Srisailam Tiger Reserve –XVII	Prakasam	Project Tiger, Giddalur	Turimella	10808.32	108.08
Buffer area for Nagarjunasagar Srisailam Tiger Reserve –XVIII	Prakasam	Project Tiger, Giddalur	Turimella	9799.00	97.99
Buffer area for Nagarjunasagar Srisailam Tiger Reserve –XIX	Prakasam	Project Tiger, Giddalur	Gundlakamma	6854.78	68.55
Buffer area for Nagarjunasagar Srisailam Tiger Reserve –XX	Prakasam	Project Tiger, Giddalur	Giddalur	23787.86	237.88
			Gundlakamma	3905.49	39.05
			Total	**27693.35**	**276.93**
Buffer area for Nagarjunasagar Srisailam Tiger Reserve –XXI	Prakasam	Project Tiger, Giddalur	Turimella	1494.69	14.95
Buffer area for Nagarjunasagar Srisailam Tiger Reserve –XXII	Prakasam	Project Tiger, Giddalur	Turimella	3758.006	37.58
Buffer area for Nagarjunasagar Srisailam Tiger Reserve –XXIII	Prakasam	Project Tiger, Giddalur	Giddalur	1025.00	10.25
			Giddalur Division Total	**61433.14**	**614.33**
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
			Total	**33734.93**	**337.35**
Buffer area for Nagarjunasagar Srisailam Tiger Reserve –XXV	Nandyal	Project Tiger, Nandyal	Bandi Atmakur	4767.26	47.67
			Nandyal	699.15	6.99
			Total	**5466.41**	**54.66**
			Nandyal Division Total	**39201.34**	**392.01**
			Grand Total	**253446.68**	**2534.46**

1.1.4. Notification of Buffer Areas:-

- Nagarjunasagar Srisailam wildlife sanctuary was declared as a wildlife sanctuary, *vide* G.O.Ms.No. 485, Forests and Rural development (For-III) Dept, dated 5th July, 1978.
- The sanctuary attained the status of Project Tiger area in 1983. This was subsequently renamed as Rajiv Gandhi Wildlife Sanctuary vide G.O.Ms.No. 233, EFS&T (For-III) Dept, dt. 16th September, 1992.
- The final Notification was issued for Rajiv Gandhi Wildlife Sanctuary vide section 26A of the Wildlife (Protection) Act, 1972 vide G.O.Ms.No. 84 EFS&T (For-III) dept, dt. 27th June, 1998.
- The Government of Andhra Pradesh notified the area of 2527 square kilometer vide G.O.M.S. No 148, EFS &T (For III) Department dated 20/12/2007 as Critical tiger habitat/inviolate area in united Andhra Pradesh. After reorganization extent is 1250.46 Sq.Km. in Nagarjunasagar Srisailam Tiger Reserve in the state of Andhra Pradesh. Thus, remaining area of the tiger reserve / sanctuary being the buffer area / peripheral area.
- The Government of Andhra Pradesh has notified the area of 1175.5 square kilometer vide G.O.Ms.No. 54, EFS&T, (FOR.II), Dept, Dt 27-07-2012 as buffer area in erstwhile united Andhra Pradesh (earlier NSTR including Telangana) which included buffer to the extent of 730.49 square kilometers in present State of Andhra Pradesh.
- 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.

Objectives of notification of Buffer:-

- The main objective of declaring the buffer area is to provide additional space for tiger conservation and to ensure adequate habitat for the dispersal of spillover populations from the core area.
- The demarcation of buffer also aims at promoting co-existence between wildlife and humans with due recognition of the livelihood, developmental, social and cultural rights of the local people. The limits of such buffer areas are determined on the basis of scientific and objective criteria with due consultation with Grama Sabha and expert committee constituted for this purpose.

1.2 APPROACH AND ACCESS:

a) By Road:		Distance in km
Eastern side:		
From Kurnool to Bairluty	-	80
Southern side:		
From Chennai to Markapur	-	380
From Ongole to Markapur	-	100

b) Rail:

1. Markapur Road to Dornal	-	35
2. Macherla to Nagarjunasagar	-	25
3. Kurnool to Atmakur	-	80

c) **By air**

1. Nearest airport at Hyderabad	-	216

1.3. STATEMENT OF SIGNIFICANCE

The buffer area of the NSTR encompasses diverse landscapes, endemic flora and fauna, and significant biodiversity value. It serves as a shock absorber against anthropogenic and other developmental pressures on the core. Some of the important values worth mentioning are -

1.3.1 Conservation values:

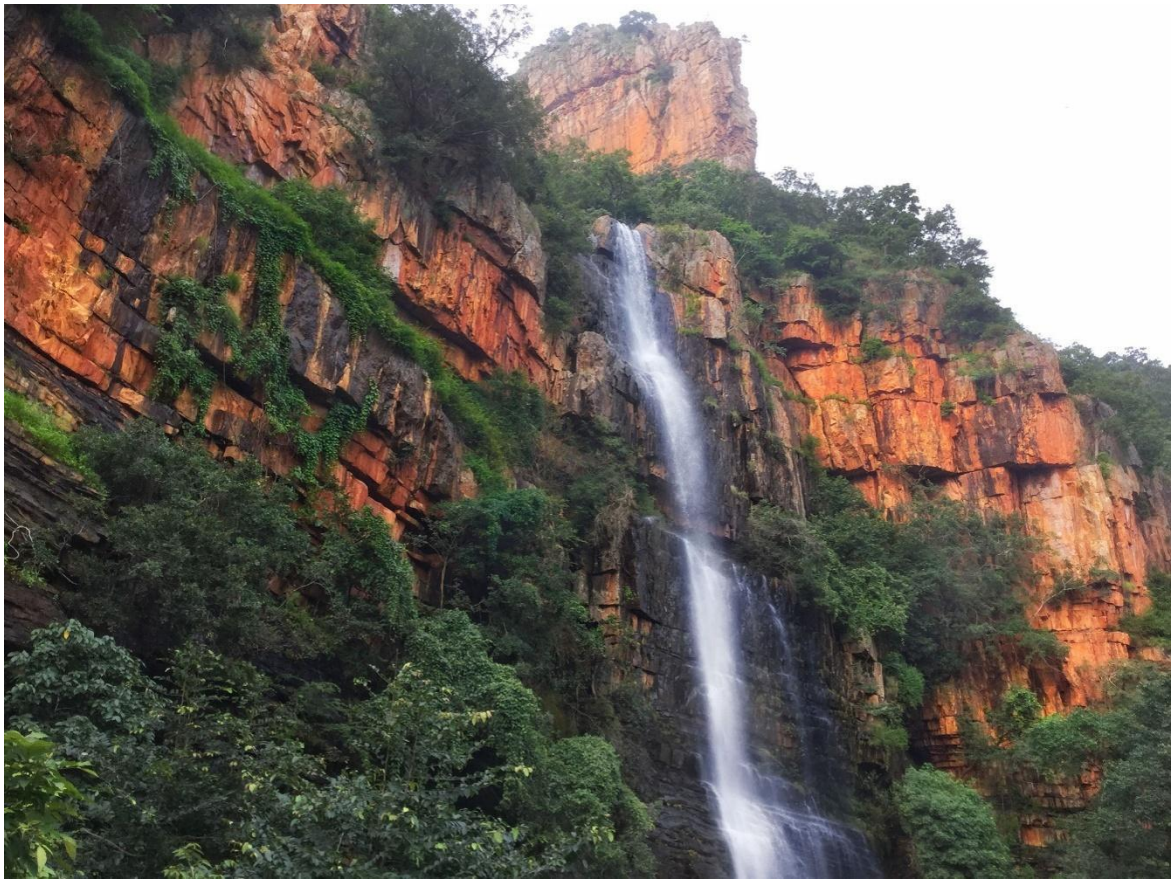
- The forests of the buffer area represent typical Deccan peninsular species of flora and fauna.
- **Supporting significant population of Tigers: -** The wildlife population, especially Tiger population is increasing. The buffer area plays a vital role for establishing new territories for surging Tiger population.
- **Potential Recreation:** There is a good potential for promotion of Eco-tourism in strategic locations in buffer area, especially riverine eco-tourism. Community based ecotourism in buffer area will be a key activity to enhance livelihood of the fringe villages and to reduce the pressure on forests.

1.3.2 Research and Education values:

Exceptional medicinal plant diversity exists in the buffer zone, but many endemic and endangered plant species need protection and research to conserve this invaluable resource.

1.3.3 Tangible values:

Fuel, fodder and NWFP resources for local people: - The buffer area supports needs and sustenance of local people especially the Chenchus.



A view of Landscape from the proposed Ahobilam Wildlife Sanctuary

CHAPTER – 2

Background Information and Attributes



2.1. GEOLOGY, ROCK AND SOIL: -

2.1.1 Geology and Rock:

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 (Achaeans), when the conditions for the existence of life on the earth were not favorable. The principal formations of Nallamala are Kurnool - Kadapa formations.

- Intrusive and extrusive igneous rocks.
- Kurnool formation consists of Shales, limestone and Quartzite and its distribution is confined to Western portion of Nallamalais.
- Kadapa formation consists of Metamorphosed Clay, Shales, Quartzite and Conglomerates.

Srisailam quartzite forms rugged plateau with bluish, grey brown and purplish colors.

2.1.2 Soils:

Ten types of soil have been identified in the areas outside the protected zones. These are: Clay, Clayey-Skeletal, Cracking Clay, Fine Clay, Fine Clayey, Gravel Clayey, Gravelly Loam, Loamy-Clayey Skeletal, Loamy Skeletal, Riverbed, and Very Fine Clay.

2.2. HYDROLOGY AND WATER SOURCES

River Krishna forms the main drainage of the catchment of core and buffer area of NSTR, running mainly from West to East and then to North. Total length of the streams in core and buffer area is estimated to be 10394.05 Km. The back water of river Krishna due to construction of dam at Srisailam spreads over large chunk outside Reserve Forests. This is trained not only for irrigation and hydroelectricity but also for supply of drinking water.

2.2.1. Water sources

2.2.1.1 Streams:

There are numerous streams, small and big, flowing over the entire reserve including core and buffer areas, most of which join river Krishna ultimately. Most of these streams are dry throughout the year except for a few months (July-November). Some of the important perennial and semi perennial streams are Galeru, the Pangidi vagu, Buggavanka etc.

2.2.1.2. Springs:

Number of surface springs exist in the interior forest which provides water for wildlife and cattle but most of them go dry during the summer season.

2.2.1.3. Waterfall:

There are numerous waterfalls both seasonal and perennial, scattered across the tiger reserve in the core and buffer area. The Nallamalais have an impressive main ridge running in a north south direction throughout the length, which forms the main watershed in the catchment. This ridge runs at an average elevation of about 750 meters.

2.2.1.4. Tanks:

The distinctive topography of the tiger reserve functions both as a catchment and a multiple watershed.

2.3. VEGETATION TYPES

2.3.1. Vegetation in Buffer area

The forests are mostly Southern Tropical dry deciduous miscellaneous type

i) *5A/C3: Southern dry mixed deciduous forests*

It is found in plain areas and gentle slopes. The main species are *Anogeissus latifolia, Chloroxylon swietenia, Boswellia seretta, Bauhinia racemosa, Soymida febrifuga, Albizzia amara, Dolichondron crispa and Sapindus emarginatus.*

ii) *5A/E5: Anogeissus latifolia type*

It is found in patches. The main associates of this species are *Chloroxylon swietenia, Terminalia tomentosa, Soyamida fabrifuga, Sapindus emarginatus, Pterocorpus marsupium, Bauhinia racemosa, Hardwickia binata.*

iii) *5A/E6: Terminalia tomentosa type*

It is found extensively in Nallamalai hills, *Terminalia tomentosa* forms considerable portion of the crop. The other associates are *Anogeissus latifolia, Terminalia chebula, Bauhinia racemosa* etc.

iv) *6A/C1: Southern thorn Forests type*

This type of forest is mainly distributed in the plain areas. Mostly they are degraded due to heavy biotic pressure from the fringe villages. The sub-soil and rocky substratum are exposed.

Based on the composition of the forests, the forests are grouped as following main types:

i) Mixed teak

ii) Yepi type (Hardwickia type)

iii) Bamboo Forests

iv) Thorny scrub type

v) Miscellaneous

a) Mixed teak:

This type of forest once contained teak in mixtures ranging from 10–30%. At present, teak is rarely seen, and when present, it is mostly as pole crops in old plantation areas. Large or mature teak trees are now very rarely found throughout the forests.

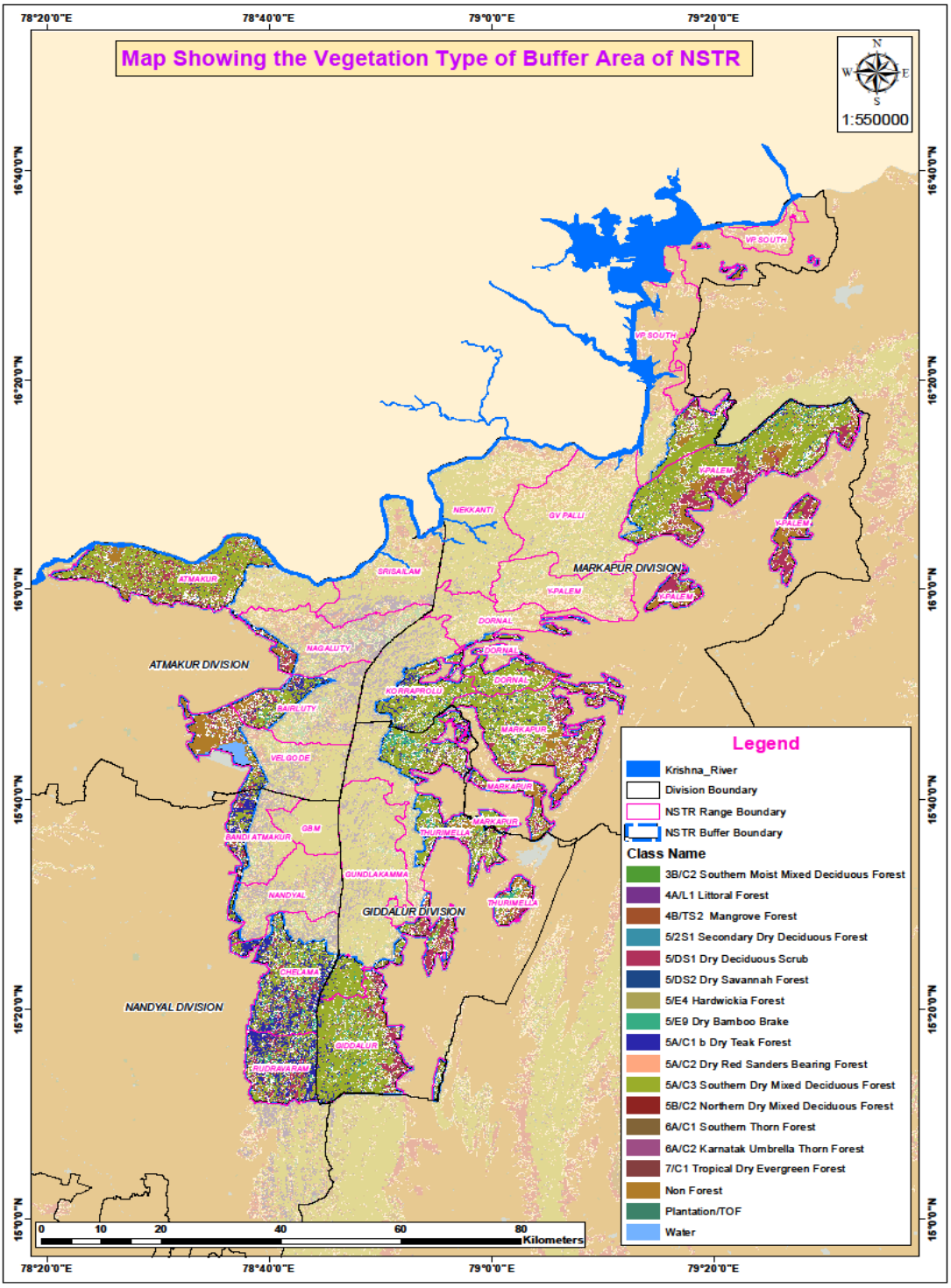
b) Yepi type:

In some places, they have attained fairly large dimensions but due to illicit felling and smuggling its proportion is gradually diminishing in the forest. It is one of the main timber species that is being seized during raids.

c) Bamboo Forests:

The principal bamboo species is *Dendrocalamus strictus* and *Bambusa arundinacea*, which are the highest revenue yielding forest in the area.

Map 5: – Map showing Vegetation Type of Buffer Areas in NSTR



2.3.2. Bio-geographical Classification:

The buffer area of Nagarjunasagar Srisailam Tiger Reserve lies astride the river Krishna in two biotic provinces of zone (6) of the Deccan peninsula i.e., 6D and 6E.

2.3.3. Ecology:

Out of four main Eco-floristic zones found in Andhra Pradesh, the Buffer area of NSTR 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).

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

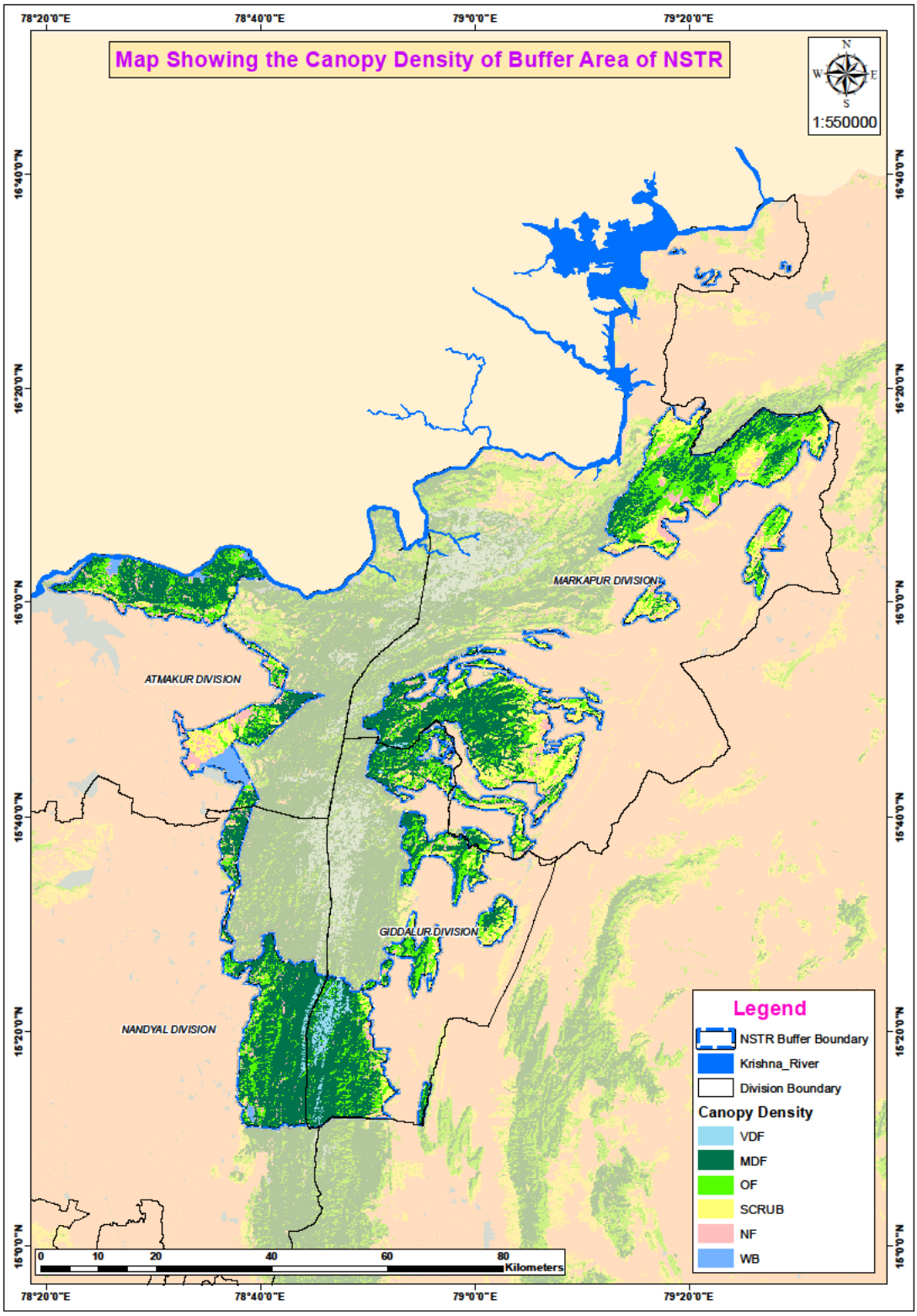
The vegetation of the buffer area can be classified under Group 5 and 6 of the "Forest Types of India" (1968) adopted by the "Champion and Seth".

- Southern dry mixed deciduous forests *degradation stage* - 5A/C3
- Secondary dry deciduous scrub forests edaphic type - 5/DS1
- *Boswellia serrata* forests - 5/E2
- *Hardwickia binata* forests - 5/E4
- Southern Tropical thorn forests - 6/A/C1
- Southern thorn scrub - 6A/C1/DS1
- Southern *Euphorbia* scrub - 6A/C1/DS2

In the Nallamala, under the broad classification of tropical vegetation, three types of forests occur—Dry Deciduous, Moist Deciduous, and Scrub—along with their subtypes and several microclimatic niches that support the growth of fidelity plants.

.

Map 6:– Map showing Canopy density of Buffer Area of NSTR



2.3.5. Evaluation of Habitats through Satellite mapping and digital analysis:

The detailed vegetation and land cover statistics of the forests of non sanctuary part of Buffer area, generated from satellite data from the year 2019 is shown in the following table. The species composition of the forest by number of stems per ha and volume contribution per ha and their percentages to total as per PIS (1970 -74).

STATEMENT SHOWING THE DIVISION WISE BUFFER AREA (OUTSIDE THE SANCTUARY) VEGETATION STATISTICS FOR THE YEAR 2019

SL. NO.	DIVISION	VDF	MDF	OF	SF	NF	WB	TOTAL
1	Atmakur	39.25	710.35	229.27	76.76	118.82	66.18	1240.63
2	Markapur	136.64	842.18	644.95	504.58	461.53	25.30	2615.18
	TOTAL	**175.89**	**1552.53**	**874.22**	**581.34**	**580.35**	**91.48**	**3855.81**

2.4. WILDLIFE AND HABITAT

2.4.1. Fauna of Buffer area of NSTR

The faunal composition represents the Deccan peninsular zone of bio-geographic classification of India. Buffer zone harbors some of the rare animals being its position in Deccan plateau of peninsular India.

2.4.1.1. Faunal diversity:

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 buffer area.

2.4.1.2. Mammals:

There are about 51 species of mammals identified in buffer area of NSTR i.e., Chiroptera (10); Insectivora (3); Rodentia (8); Logomorpha (1); Pholidoata (1); Primates (3); Carnivora (17); Artiodactyla (8).

2.4.1.3. Birds:

There are about 305 species of avifauna identified in the buffer area.

2.4.1.4. Amphibians and Reptiles:

The buffer of tiger reserve supports about 18 species of amphibians belonging to 12 genera, distributed in 4 families and 59 species of reptiles belonging to 42 genera, distributed in 15 families.

2.4.1.5. Fishes:

This tiger reserve constitutes significant piscine fauna comprising 55 species of 36 genera under 20 families.






2.4.1. Edges and ecotones:

Transition between dry deciduous forests and thorn forests provides maximum ecotone effect and supports many deers and antelopes.

2.4.2 Presence and adequacy of cliffs, ledges, caves, dens etc:

The Nallamala hill ranges with valleys and gorges are 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 river banks of Krishna in the buffer zone.

2.4.3. Fodder species and forage conditions:

Plenty of fodder is available in 70% of the reserve in the form of grasses and browsable material.

2.4.4. Natural saltlicks, wallows, shallow pools and water etc:

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

2.4.5. Cover, undergrowth, grass etc.:

In the western part of the buffer area, there is adequate undergrowth and grass that provide shelter and cover for various fauna. *Lantana camara* offers good cover for gallinaceous birds and tigers, while bamboo clumps provide effective cover in most areas. Tall grasses (up to 2 m) also serve as important cover.

2.4.6. Frequency and Distribution of large and old trees:

Large trees though less in number are distributed almost uniformly throughout the buffer area except in eastern parts of sanctuary. Particularly giant tree species like *Terminalia, Tamarindus, Hardwickia, Givotia* and *Bosewellia* are found all over the buffer area.

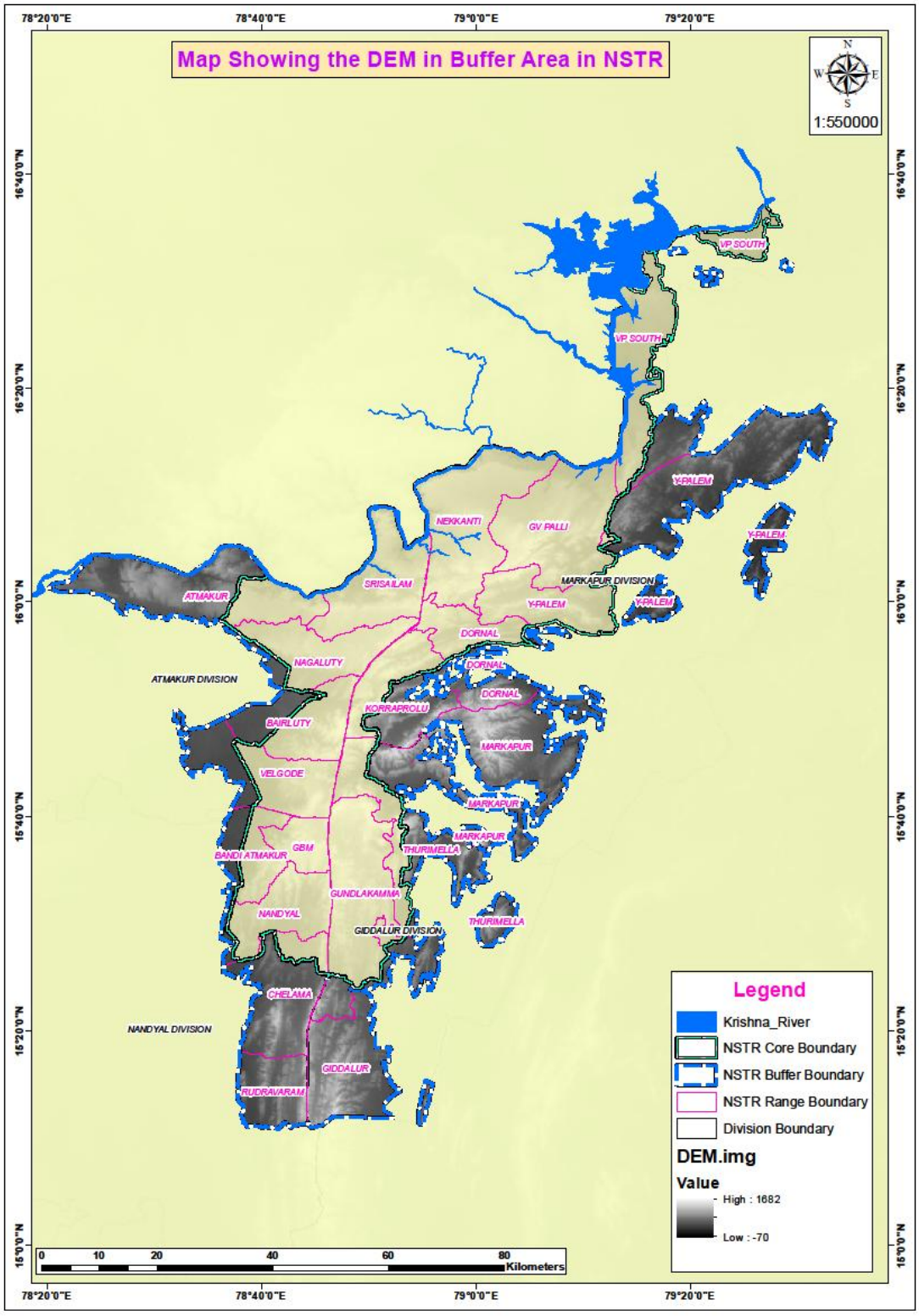
2.4.7. Aquatic habitat:

River Krishna flowing through the buffer area part of NSTR provide good aquatic habitat for residential as well as migratory birds. It is a good habitat for Mugger crocodile, smooth – coated Indian Otter and many varieties of fish and amphibians. Flocks of Demoiselle Cranes and Bar-headed Geese are seen along the river Krishna.

2.5. MAJOR CONSPICUOUS CHANGES IN THE HABITAT SINCE INCEPTION IN BUFFER AREA

- The moisture regime in the soil has substantially increased due to various soil and moisture conservation measures taken up under various schemes, which has also contributed towards the improvement in vegetation.
- The vegetation change detection maps of APFD Geomatics Center, National Remote Sensing Agency (NRSA), and Forest Survey of India (FSI) showed the positive changes in the vegetation.

Map 7:– Map showing Digital Elevation Model (DEM) in Buffer Areas in NSTR



CHAPTER-3
Status of Tiger and Co-predators



The National level tiger Assessment report published by National Tiger Conservation Authority (NTCA) and Wildlife Institute of India (WII) in 2022 shows the estimated tiger population is in the range of 58-70 tigers in NSTR. As the Buffer area is located adjoining and around the Core area and movement of tigers between core and buffer areas are frequent, it is difficult to arrive at the number of tigers in the buffer separately. Hence, it is estimated that the number of tigers is in the range of 58-70 tigers, as indicated by the NTCA in 2022.

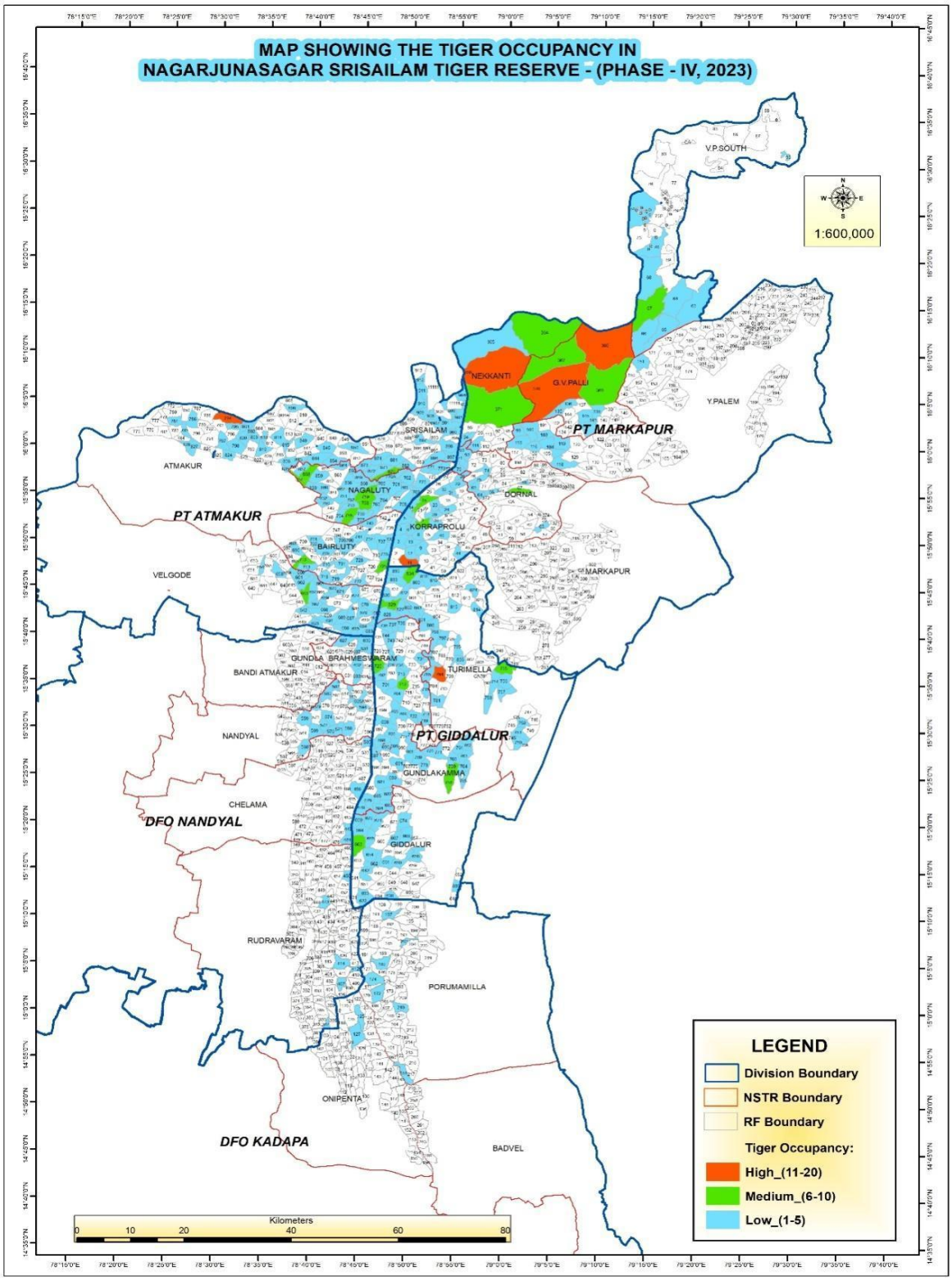
3.1 DISTRIBUTION

The tiger population declined from 94 in the 1980s to as few as 34 in the 1990s. The major causes of this decline were hunting, low prey density, and man-animal conflict, as tigers frequently preyed on cattle.

However, there has since been a significant increase in tiger numbers within the core area, which is expected to have a spillover effect into the buffer areas as well. With the population on the rise, the buffer zone has become essential as it provides new habitats and territories for young tigers dispersing from adults to establish their own ranges. Numerous records confirm tiger movements within the notified buffer zone.

Co-predators such as leopards and dholes are also frequently encountered, with direct and indirect evidence of their presence regularly recorded. This highlights the importance of the buffer zone as an additional habitat and extended territory for tigers, co-predators and their prey

Map 8 :– Map showing Tiger Occupancy in Buffer Areas in NSTR



3.2. ABUNDANCE STATUS

At present highest density of tigers are noticed in G.V.Palli, Nekkanti and Korraprolu ranges of Project Tiger Markapur followed by the Nagaluty and Srisailam Ranges of Project Tiger Atmakur.

Distribution of animals in different habitats and their trophic niches

The carnivores are distributed throughout the buffer area. However, their density is more in the places where, there is a good prey density. In general, the tigers occupy the prey dominated areas in buffer areas. The leopards occupy fringe habitats between different tiger territories.

3.3. PREY - PREDATOR RELATIONSHIPS

Tigers in buffer area of NSTR have a varied diet. The most important prey species is wild boar (*Sus- scrofa: 37-38%)* followed by sambar (*Rusa unicolor: 28-29%)* and chital (*Axis axis: 17-18%).* The prey species include four horned antelope, langur, sloth bear and porcupine. In several places along the trails, tigers routinely kill larger livestock (primarily buffaloes and bulls) while Leopards prefer smaller livestock (Calves and goats). There are instances of Leopard scavenging tiger and wild dog kills.



3.4. ASSESSMENT OF THREATS

The following threats have been recognized in buffer area of Tiger Reserve

- Heavy dependence of the local people on the forests for collection of Non-Timber forest produce (NTFP) and small timber extraction.
- Pilgrims during festival seasons like Ugadi and Shivratri may cause damage to buffer area of Tiger Reserve in terms of waste disposals and movement restriction in regular animal trails.
- Attempts for illicit removal of Bamboos and other grasses in the Reserve forest areas of the buffer.
- Habitat fragmentation due to the competing claims over the land.
- Forest Fire incidents.
- Disturbance caused due to developmental activities by various agencies for resource utilization.
- Proposals for widening the road network inside the Sanctuary.
- Attempts of poaching wildlife.

CHAPTER-4

History of Past Management and Present practices



The Jungle Conservancy Department under the British rule, took over the administration of the forests in 1862 in the Southern side of River Krishna. 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. The Northern part of the river Krishna was ruled by Nizam of Hyderabad State. Forest Acts were promulgated to regulate the forest resources from 1900 A.D. onwards in Hyderabad state.

On 2nd of June 2014, the erstwhile state of Andhra Pradesh was reorganized and divided into Andhra Pradesh and Telangana. This plan pertains to the buffer area of NSTR of Andhra Pradesh.

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 in the

Reserve, habitat improvement works, infrastructure maintenance & improvement and day to day maintenance of the Reserve in nutshell.

4.1. CONSERVATION AND FOREST MANAGEMENT HISTORY

4.1.1. General History of the Forests:

a) Southern Bank:

The historical management of the forests in the Nallamala, which are now part of the buffer area can be divided into five 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.

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 on under the "permit system" at a nominal rate, and illicit fellings occurred on a large scale.

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. Timber fellings were undertaken in the form of improvement fellings under 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. During this period departmental exploitation for forest produce was replaced by contractors' agency.

5) 1942--1962: During this period large-scale plantation of teak were given up. Artificial regeneration was proposed in the timber selection and pole series was a failure. Coppice with standards system was replaced with coppice with reserves.

6) 1962--1978: During this period Y.C. Lakshmiah Naidu's working plan was in force and followed the similar system as above period.

7) 1980--1988: Lastly these forests have been worked under the Nallamalai Industrial Management Plan to feed the industries.

b) Northern Bank: (1905-1948)

The first plan for Amarabad areas was prepared by Shri M.A. Rahim in 1931. Subsequently, many plans evolved for the scientific management of resource base were in place.

These plans addressed:

- Wildlife Management to control and regulate hunting. The shooting blocks were worked on a cycle of 4 years.
- An area of 14,177 acres around Srisailam temple forming part of shooting block was restricted for each license holder.
- Crop protection guns were to be deposited in the nearest police station during non-crop season but this rule was more violated than practised.
- The Forest Department improved important saltlicks and water holes. Cattle lifters and man-eaters were to promptly be destroyed by the sportsmen on an order.
- In course of time in some parts of the sanctuary (Markapur Reserve Forest) no shooting licenses were given except for wild dogs.
- But again, 1968 shooting blocks were opened with a closing period from 1st June to 30th June every year.

Timber Operations including Bamboo and firewood harvest:

Bamboo coupes are operational only in the reserved forest areas of Buffer only. They were all closed in the sanctuary part of Buffer area immediately after the order of Apex Court.

CONSERVATION AND MANAGEMENT AFTER FORMATION OF THE TIGER RESERVE

4.1.2. FIRST MANAGEMENT PLAN (1990 – 1995)

Jaganmohan Rao's First Management Plan:

After declaration of the sanctuary in 1978, the management of the area shifted towards the Wildlife Management under the Directorship of Sri K. Jagan Mohan Rao, IFS Conservator of Forests, who wrote the first management plan for the period (1990 to 1995).

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 great extent.

Results:

- Once the hostile extremists against the P.T, now, warned the people of dire consequence for destruction of forests.
- Socio-economic problems of the people successfully been prioritized and addressed.
- Sensitization on the importance of conservation to the livelihoods of people minimized conflicts.
- Orientation of staff towards welfare of the people created confidence in them.
- Fear of extremists among the staff, to a large extent decreased.
- No interference of extremists in PA activities except for little stray incidents either by mistake or when perceived threat.
- The successful implementation of the Eco-development program through people's involvement has improved the quality of habitat, which in turn has led to the dispersal of fragmented and restricted prey base. Frequency of sighting of wild herbivores - Chital, Sambar, Nilgai, Four-horned antelope, and Chinkara increased.

4.1.3. THE SECOND MANAGEMENT PLAN (2000–2005)

Thulsi Rao's Biodiversity Management Plan:

The Second Management Plan for N.S.T.R was written by Sri K. Thulsi Rao, for the period 2000 to 2005 basing on the scientific study carried out, with a goal to *"*Conserve natural resources typical of the Nallamala with a special emphasis on protecting the Tiger with his habitat'.

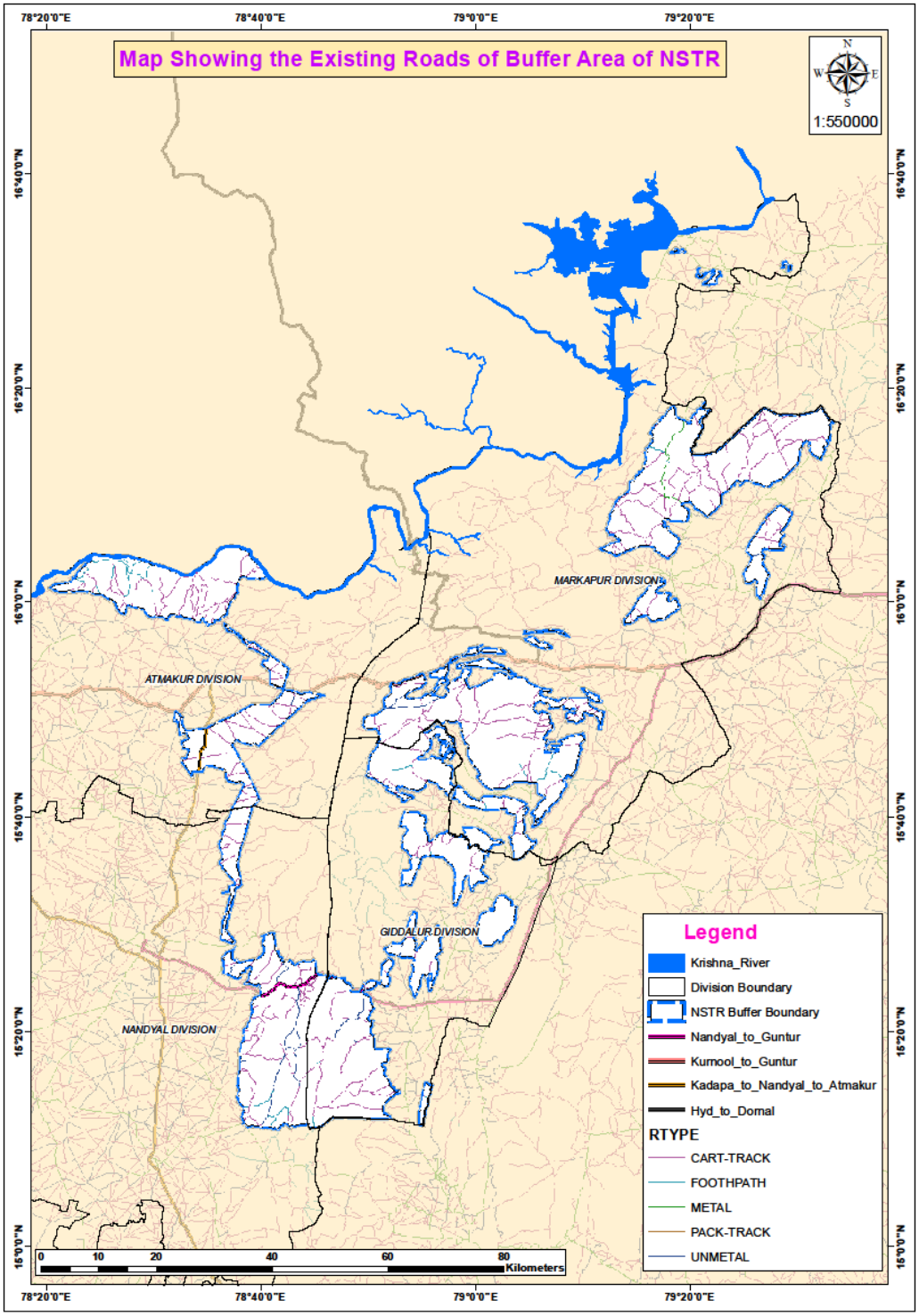
COMMUNICATION

Road network:

- The buffer area is connected to all the District Headquarters and the capital of Andhra Pradesh with well-laid blacktopped (BT) road network.
- Road connecting Hyderabad to Guntur-Kurnool Road runs through the middle of the buffer area connecting Mannanur - Srisailam - Dornal.
- Entire periphery of the buffer is also covered with the B.T. roads.

- There is good Network of coupe paths (coupe paths laid before declaration of sanctuary) existing connecting all interior Forests.
- All these need to be maintained for the movement of the staff to check illegal activities if any.

Map 9:– Map showing Road network in Buffer Area in NSTR



4.1.4. THIRD MANAGEMENT PLAN (2013-14 to 2022-23)

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 aimed at 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 Nallamalais to Seshachalam hills through various stepping stones 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 aimed at conservation of tiger populations at source and outside the Protected Areas.

Consolidation of Forest area in Project Tiger Circle: Series of attempts have been done in declaration of buffer area for Gundlabrahmeswaram and Rajiv Gandhi Wildlife Sancturies and proposals were sent to Government. Attempts were made to consolidate Core and Buffer areas by the Chief Wildlife Warden of the State. Massive 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 for approval. These proposals were prepared by studying the distribution of prey and predator in the areas of Core and proposed Buffer.

After re-organisation of State of Andhra Pradesh, the area of NSTR is not notified, considering the reorganization of the department in view of the formation of new districts in the state of Andhra Pradesh, proposals have been sent to Government for re-notification of NSTR:

i. by including the earlier buffer proposals which was not declared. (NSTR buffer, GBM buffer since its addition as extended core which are pending with Government).
ii. by implementing the NTCA guidelines/ MEE reports bringing the entire area of Tiger Reserve under Unified Command which was not there since inception of 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 included the area in the State of Telangana.

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

Wireless network:-

This buffer is well connected through a Network of Wireless with ground stations and mobile stations. Adequate number of handsets are given to the Executive staff for effective communication.

4.2. PROTECTION OF TIGER, ITS PREY AND HABITAT

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 existing 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 protection watchers 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 (shandis) 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 the submission of certificates required and arrange immediate compensation to the owner to avoid the possibility of poisoning. **(NTCA SOP on livestock depredation)**
9. In areas where more than three incidents of livestock depredation are reported within a fortnight, continuous monitoring based on field evidence 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. Deputy Directors/District Forest Officers shall organize quarterly review meetings with the Superintendent of Police to exchange crime dossiers with local police and facilitate updation.
12. Deputy Directors/District 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.

4.3. Eco Tourism, Nature Education and Interpretation:-

4.3.1. Eco-Tourism:

This item is discussed in chapter 14 of Buffer plan.

4.3.2. Ecological Knowledge Park

Ecological Knowledge Park, Biodiversity Research Center and Environmental Education Centre (EEC) located at Sundipenta are meant for research, imparting the knowledge of evolutionary processes, information about not only core area but also buffer area and species checklist to visitors, especially students from colleges and schools.

4.4. Research, Monitoring and Wildlife Health.

This item is discussed in detail at Chapter 11 of Buffer plan.

4.5. Relocation of Villages:

No villages have been relocated or are proposed for relocation at present.

4.6 ADMINISTRATION AND ORGANIZATION:

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 T Department Dated: 05.11.2003.

4.6.1 Advisory Committee

The State Government shall constitute an "Advisory Committee" as per Section 33B of Wildlife (P) Act, 1972 consisting of the Chief Wildlife Warden or the Conservator of Forests and the Field Director, Project Tiger as its head and shall include a member of the State Legislature within whose constituency the sanctuary is situated, three representatives from the Panchayat Raj Institutions, two representatives from N.G.O and three individuals active in the field of wildlife conservation, one representative each from the departments dealing with home and veterinary matters, 'Honorary Wildlife Warden' and Officer-in-charge of the Sanctuary, as Member Secretary.

4.6.2 Tiger Steering Committee

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 their prey within the State of Andhra Pradesh.

4.6.3 Tiger Conservation Foundation:-

The Tiger Conservation Foundation for NSTR has been created vide G.O.Ms. No.143, EFS & T Department, dt.15.12.2007 and G.O.Rt.No.210 Dated: 02.05.2008. The purview of the Foundation includes the buffer area of NSTR also.

4.6.4 Staff Deployment

The Field Director of Nagarjunasagar Srisailam Tiger Reserve is of the rank of Conservator of Forests and is the overall in-charge of the Buffer area of NSTR. He is responsible to the state government 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.

The administrative office of the Field director is located at Nandyal (field headquarter at Srisailam) and the offices of the Deputy Director, Project Tiger situated at Atmakur, Markapur, Giddalur and Nandyal.

Table :- 3 The Reorganized structure of management units under Deputy Directors

Division	Ranges		Sections		Beats	
	Existing	After Re-organisation	Existing	After Re-organisation	Existing	After Re-organisation
PT, Atmakur	7	7	23	30	42	42
PT, Markapur	5	7	15	21	49	52
PT, Giddalur	2	5	6	19	12	28
PT, Nandyal	4	9	11	28	21	59
FDPT Circle Total	**18**	**28**	**55**	**98**	**124**	**181**

4.6.5 Hierarchical Structure: -

Four Deputy Directors holding charge of the Project Tiger Divisions *viz*., Atmakur, Markapur, Giddalur and Nandyal, the DFO Flying Squad and ACF (Biodiversity) and their staff assist the CF and FD in the management of the buffer area.

Staff working under Flying Squad and Research division is drafted from the respective Territorial Divisions.

There is a Research Division headed by an Asst. Conservator of Forests specialized in Environmental Science or Wildlife Management. Project scientists have been taken on contract basis under various Research Projects of ongoing schemes.

4.7. Other Land Use – Villages, Agriculture, Developmental Programmes And Tourism

4.7.1 Grazing

After the onset of the monsoon, people drive their cattle from the adjoining plains for grazing into the sanctuary and grazing is done for six months from mid June to end of December. These animals compete for water and fodder with wild animals.

4.7.2 NWFP Collection

The forests of Nallamala in the buffer area are well known for a variety of NWFPs. People from local villages collect different types of NWFPs for both domestic consumption and commercial purposes. At times, it has been observed that NTFP collectors set fires to facilitate easier collection and to enhance yield.

4.7.3 Chenchu

- Collection of NWFP is the primary source of income accounting for 45%.
- Overall collection of NWFP contributes 6-45% of household income.
- Employment opportunities as agricultural labourer are limited.
- Over 60% of the expenditure is on food and clothes.

The other item absorbing a significant part of household expenditure is intoxicants at around 10% illustrating the tribals ingrained habit of drinking.

4.7.4 Lambadas

The Lambadas earn their livelihood by raising cattle and selling the milk products besides practicing agriculture.

4.7.5 Farmers:

As most of the region is rainfed, dryland 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 cycle of debts. Measures have to be taken up to provide alternate livelihood options.

4.7.6 Non-Forest Dependent Occupations

Agriculture (Present status)

(a) Crop area: The total cropped area of twelve (12) Mandals is estimated at 1,03,096 Ha, out of which two crops are growing in 22% of the area, which causes total annual crop area to be 1,31,981 ha. These figures present an over-simplified picture of the net and gross crop area since some of the short-season kharif “cash" crops are not included and the irrigated area has not been up-dated since 1981.

With the release of high yielding short season pulses already being grown by the farmers in the plains, the intensity of croping and the crop productivity is expected to increase.

(b) Cropping System: The main cereal crops are paddy, sorghum and maize. Pulse crops include Blackgram, Greengram, Horsegram and Bengal gram. The major Oilseeds are Groundnut, Castor and Sunflower. The growing of cash crops is important in some areas, particularly cotton, chilli, tobacco and to a lesser extent, sunflower, Castor and Soybean.

4.7.7 Labour

Family Labour: The average family of forest dependent user groups has around 2.5 labour units providing about 625 days (based on 250 working days / year / labour unit) of available family labour.

4.7.8 Forest-Dependent Occupations:-

About 250 villages, one way or other depend on the resource base of the buffer area to meet their subsistence needs. Approximately 5.8 Lakh people and 2.94 Lakhs livestock of twelve mandals depend on this resource. The Mandal wise livestock population is given in the following table.

Table – 4: Division wise Livestock population - 2011 Census

Sl. No	Division	Name of the cattle					Total
		Cow	Goat	Sheep	Buffalo	Others	
1	PT Markapur	2767	10448	9156	4726	867	**31437**
2	PT Atmakur	4329	1848	4752	2433	90	**23090**
3	PT Nandyal	10485	28324	122769	1787	0	195796
4	PT Giddalur	2277	10540	21660	8898	476	43851
	Total	**19858**	**51160**	**158337**	**17844**	**1433**	**294174**

It is to be mentioned that energy requirements of the villagers from forests are enormous, causing damage to forests and wildlife of buffer area. One of the objectives of this plan is to develop alternate energy resources on the community lands to meet the biomass needs.

4.7.9 Sustainability and Carrying Capacity of Forests:-

Grazing:

The cattle mostly of inferior type consume the palatable grasses which otherwise would have been available to the wild herbivores. Fodder from the agricultural fields hardly meets the demand.

Fuel wood Collection:

Firewood is mainly used for cooking, water heating and keeping houses warm during the winter in the villages. However, some villagers collect the firewood for commercial purposes from the reserved forests of buffer area.

Timber and Small Wood:

The local people use Smallwood for variety of purposes. The use of Smallwood is mainly for (a) House construction. (b) Agriculture Implements.

Leaf plate Making:

About 550 families of different villages in adjoining the buffer area depend on collection of leaves or making leaf plates or both.

Collection of Tuniki leaves

About 1060 families depend on this business earning an amount of about Rs.15.90 lakhs during April-May from the Reserved Forests of Buffer Area. This provides good employment during the lean months.

Bamboo basket making:

Bamboo basket making is bread earner for the villagers of Vadlaramapuram and Medaras of Sundipenta. These villagers cut and transport illegally the Bamboo from the Indreswaram, Peddacheruvu and Pangidi beats. They make Chandrikas *(Baskets for rearing Silk worms)* and sell them in the Atmakur market and export to Karnataka.

Carpentry:

About 1500 carpenters are dependent by making agricultural implements, bullock carts, construction of houses, making furniture and bodybuilding for trucks etc. More often than not, the wood used by them is illegally bought from the smugglers. At least 25% of smuggled wood is the raw material for the carpenters.

Harvesting of rock Honey

Mostly the Chenchus of NSTR collect honey from the trees and rock cliffs. They make crude and laborious efforts to collect honey from the tall trees and from the over hanging cliffs.

4.7.10 MAN-ANIMAL CONFLICTS

Crop Raiding:

Crop damage by wild animals has become the main reason for the conflict between the protected area and the people. It is found that about 30 - 35% of the crops are either eaten or destroyed by the wild life. About 70-75% of the damage is caused by wild boars and chital (about 15%) and sambar (about 10%). Chital mostly eat Paddy, Kandi (Arhar grams), Sorghum and Bajra while sambar prefers maize, paddy and Chana. The compensation for damage to house or crop or any other property is being paid promptly as per government orders.

CHAPTER – 5

Land use Patterns and Conservation-Management Issues



5.1 LAND USE CLASSIFICATION

5.1.1 Human Population Structure:

As per 2011 Census, the population of Andhra Pradesh is 84.58 million and separate data after reorganization is not available. The overall population density is 308 per Sq. Km. 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

5.1.2 Habitations:

About 35 villages are situated in and around ($\leq$ 2 km.) the buffer area of Tiger Reserve

Table 5: - District wise, number of villages in and around the buffer area within 2 kms Distance from the Sanctuary.

S. No.	District	Total
		Fringe (≤ 2 Kms)
1.	Nandyal	12
2.	Palnadu	9
3.	Prakasam	14
	Total	**35**

5.2. SOCIO-ECONOMIC PROFILE OF VILLAGES

5.2.1. Chenchu:

Collection of NWFP is the primary source of income accounting for 45% (PRA). Overall collection of NWFP contributes 6-45% of household income.

5.2.2. Lambadas:

The Lambadas earn their livelihood by raising cattle and selling the milk products besides practicing agriculture. Since the cattle are of inferior quality, they cannot get substantial income from them.

5.2.3 Farmers:

As most of the region is rain-fed, dry land crops are raised by the farmers. Since the crop yield is not commensurate with the investment. To cope with the situation and for survival they find smuggling as an alternative.

5.2.4 Fishermen:

Fishermen of the coastal Andhra Pradesh migrated and settled along 130 Km length of the river Krishna within the boundaries of buffer, mostly in reserve forests part of buffer in NSTR. Though their catch per day is good, they are exploited by the middle men. The following recommendations are made to enforce the section 29 of Wildlife (Protection) Amendment Act, 2006.

- Fishing is regulated and all the fishermen families from the shores of the river Krishna within the sanctuary part of buffer are relocated.
- Traditional fishing shall be allowed as prescribed by the Field Director.

5.2.5 Agriculture (Present Status):

- Crop area: The total cropped area is estimated at 65,752 Ha, of which in 22% area two crops are taken up thus total annual crop area is 131504 Ha.
- Cropping System: The main cereal crops are paddy, sorghum and maize. Pulse crops include black gram, green gram, horse gram and bengal gram and the major oilseeds are groundnut, castor and sunflower. The growing of cash crops is important in some areas, particularly cotton, chilli, tobacco and to a lesser extent soyabean.
- Crop Rotations: Farmers vary their crop rotations according to the onset of the monsoon. Kharif crop as mainly paddy and later sorghum, sunflower, groundnut, bengal gram would follow this.
- Land use changes and deforestation risk: Present decennial rate of population growth at 13.86% causes non-availability of suitable lands for agriculture in the villages. The projections of "Area Production Model (APM)" for 30 years (2001-2030) estimates that the deforestation risk of natural forests being converted into agricultural fields is to the tune of 13000 Ha.

5.2.6. Labour:

Family Labour: The average family of NSTR user groups has around 2.5 labour units providing about 625 days (based on 250 working days / year / labour unit) of available family labour.

5.3. RESOURCE DEPENDENCE OF VILLAGES:

About 35 villages one way or other depend on the resource base of the sanctuary to meet their subsistence needs. Approximately 5.8 Lakh people and 6.24 Lakhs livestock of seven Mandals depend on this resource.

5.3.1 Supply:

The sustainability and carrying capacity of the forests has been computed and discussed in Eco-Development Plan under Proposed Management Actions.

As seen from the mean grass biomass table computed through remotely sensed data the average grass yield is 0.289 Kg/m^2 or 2.9 tonnes/Ha. The productive grass area in NSTR is 1,33,122 Ha. Thus, the total productivity comes to 3,86,053.8 tonnes.

5.3.2 Demand:

The mean grass consumption by a cow unit is considered to be 5 Kg of dry grass weight. The yearly grass consumption by the cattle from NSTR resources is computed as follows. Average number of days of stay of cattle is assumed as 270 days for resident (413636 CU) and 180 for migratory (150000 CU) ones. The fodder requirement @ 5 Kg per day for 9 and 6 months both for resident and migratory cattle is 6.934 lakh tonnes per annum. Thus, there is a shortage of palatable grass is about 3.073 lakh tonnes/year.

5.3.3 Grazing: -

The cattle mostly of inferior type consume the palatable grasses which otherwise would have been available to the wild herbivores. Fodder from the agricultural fields hardly meets the demand.

5.3.4 Fuel wood Collection:

Firewood is mainly used for cooking, water heating and keeping houses warm during the winter in the villages. However, some villagers collect the firewood for commercial purposes.

5.3.5 Timber and Small Wood:

The local people use small wood for variety of purposes. The use of small wood is mainly for (a) House construction. (b) Agriculture Implements. About 1007 m^3 of small timber is needed for the agricultural implements in 50 fringe villages. The total wood requirement for both the housing and agricultural implements is 2,146 m^3 per annum.

5.3.6 Bamboo basket making: -

Bamboo basket making is bread earner for the villagers of Vadlaramapuram and Sundipenta. These villagers used to cut and transport illegally the Bamboo from the Indreswaram, Peddacheruvu and Pangidi beats, but now under control due to protection measures. They make Chandrikas *(Baskets for rearing Silk worms)* and sell them in the Atmakur market and export to Karnataka.

5.3.7 Carpentry:

About 500 carpenters depends for their livelihood by making agricultural implements, bullock cart, construction of houses, furniture and bodybuilding for trucks, etc. Mostly the wood used by them is illegally bought from the smugglers. At least 5% of smuggled wood is the raw material for the carpenters. The only solution for discouraging this practice is

providing alternative employment for smugglers who fetch timber for them, besides providing alternate source of income for the carpenters.

5.3.8 Honey collection: -

Mostly the Chenchus of NSTR collect honey from the trees and rock cliffs. They make crude and laborious efforts to collect honey from the tall trees and from the over hanging cliffs. In that process they harm the honey combs which affect the sustained yield. Therefore, the Project Tiger authorities and Center for Peoples Forestry (N.G.O) have jointly taken up awareness and training classes through folklore.

5.4 HUMAN-WILDLIFE CONFLICTS

5.4.1 Crop Raiding:

Crop damage by wild animals has become the main reason for the conflict between the protected area and the people. It is predicted that about 30 - 35% of the crops are either eaten or destroyed by the wildlife. About 70-75% of the damage is caused by wild boars and spotted deer (about 15%) and sambar (about 10%). Spotted deer mostly prefers paddy, Kandi (arhar grams), sorghum and bajra while sambar prefers maize, paddy and chana.
For the damages caused to crop, the compensation shall be paid as per government order:

- The Ex-gratia granted is paid to the person injured or the legal heir in the case of death of the person (Rs.5,00,000/- for the wildlife caused human death cases).
- The damages caused to agricultural crop other than paddy and sugarcane is paid up to Rs.6000/- per acre.
- The compensation for the damages to paddy crop be paid upto Rs.6000/- per acre if entire crop is damages.
- The compensation for the damage caused to Sugarcane crop is paid upto Rs.6000/- per acre if entire crop is damaged.
- The compensation for the damage caused to grown up Mango Trees and Coconut Trees is paid Rs.1500/- per tree for total damages of trees.
- Damage to Horticulture Crops like Banana and Citrus Fruit Trees, is compensated based on the assessment of Revenue Officials / Horticulture Department.

5.4.2 Cattle Lifting:

There are number of instances of cattle lifting and cattle kill cases reported in buffer area. The Leopard attacks on live stock is a common phenomenon and there are also incidents of tiger attack. Cattle lifting by the tiger or Leopard on the livestock are occurring frequently in the fringe villages. In fact, actual number of cases of cattle deaths/ injury caused by them exceeds the official records as most of them are not being reported.

Disproportionate compensations to the actual cost of the animal killed had turned out to be the source of antagonism against the park previously but now the compensations are paid as per assessments of government veterinary doctor and market value. After careful consideration and in suppression of the orders issued earlier Government approved for repayment of compensation for loss of life or injury to human lives and cattle killed due to attack of Tigers or other Wild Animals in the State, as specified in the rules in G.O.Ms. No 90, Dated: 01.08.2011

The financial assistance as compensation for death of domestic cattle (Buffaloes, Bullocks, Bulls, Cows, Sheep and their young ones but does not include Goats) killed by a Carnivore (Hyena, Wolf, Wild Dog, Bear, Leopard, Crocodile and Tiger) shall be given subject to the fulfillment of the following conditions:

- Compensation is payable when any cattle is killed by carnivore. No compensation is, however is paid for migratory cattle killed inside the Sanctuary.
- Information regarding the kill of cattle by a Carnivore should be given to the nearest Forest Officer by the owner within 78 hours i.e. (2 days) of the killing.
- Under no circumstances the kill be shifted from the place where it was killed or found left by the carnivore till it is inspected by a Forest Officer, not below the rank of Forest Beat Officer.
- The incident of Cattle killed by a Carnivore should be certified by a Forest Officer not below the rank of Forest Section Officer who will verify the age, general health and also estimate the value of the Cattle killed.
- The amount of compensation in an individual case of cattle killed is paid as per the market value of the cattle, as assessed by the livestock inspector or veterinary officer or village sarpanch as per availability.

- The concerned Divisional Forest Officer / Wildlife Warden / Assistant Conservator of Forests, or Divisional Forest Officer (Anti Poaching Squad) in whose jurisdiction the cattle kill has occurred shall sanction the compensation to the owner of the cattle.
- The full compensation can be paid in cash / draft / cheque to the owner of the cattle in the presence of two local Panchayat persons.

5.4.3 Death/Injury to Humans:

Wild animal attack on human beings is not uncommon. Mostly the victims are marginal people grass-cutters and NTFP gatherers. Grievous injuries or deaths are caused by the Sloth Bears and occasionally by the Leopards. Ex-gratia will be payable towards injury or loss human life by any wild animal except Snakes and Monkeys in the State on fulfillment of the following conditions:

- Spot inspection is being done preferably within 2 days if it is loss of life, by a Forest Officer not below the rank of Forest Range Officer or by a Police Officer not below the rank of a Sub Inspector.
- A Medical Certificate as to the cause of injury or loss of life will be necessary from a Government Doctor not below the rank of Assistant Civil Surgeon, in respect of such happening.
- The Ex-gratia granted is paid to the person injured or to the legal heir in the case of death of the person.
- The maximum limit of Ex-gratia, in an individual case shall not exceed Rs. 5.00 lakhs in case of loss of human life. Half of the amount is paid in cash through Demand Draft and remaining shall be paid through long term deposits. Funeral charges of Rs.2000/- shall be paid on the same day by the Divisional Forest Officer/ Forest Range Officer which will be deducted from the Ex-gratia sanctioned.
- In case of grievous injury an amount of Rs.75,000/- is paid for the following:

  a. Total permanent disablement resulting in disqualification to continue in any avocation.

  b. Grievous hurt falling within section 320 of the Indian Penal Code.

     i. Emasculation.

     ii. Permanent privation of sight of either eye

iii. Privation of any member of Joint of the body.

iv. Destruction or permanent impairing of powers of any member of Joint of the body.

v. Permanent disfiguration of face or head.

c. In case of minor injury, the actual cost of treatment shall be paid on production of medical bill certified by a Government doctor not below the rank of Assistant Civil Surgeon.

However, in case of injury or hospitalization of the victim, advance payment to maximum of Rs.10,000/- to be paid by the Divisional Forest Officer / Wildlife Warden having jurisdiction over the area in consultation with the hospital authorities to be adjusted in final payment.

5.4.4 Encroachments:

The Supreme Court of India in its judgment dated 12/12/1996 in W.P. (Civil) No 202 of 1995 has given direction to all the State Governments to see that all non - forestry activities in the forests shall cease forthwith.

Government of Andhra Pradesh in its memo No. 26531/FOR_I /87 EFS & T Department, Dated: 3/11/1995 has given guidelines to bring encroached lands under beneficial tree plantations to the people to re-gain the lands back and simultaneously stop further encroachment.

5.5. ASSESSMENTS OF INPUTS OF LINE AGENCIES/ OTHER DEPARTMENTS

- The resource allocation granted by the line departments for the welfare of the communities living in buffer zone has to be assessed. For example, the quantity of the agricultural input subsidies to farmers who are cultivating in the areas close to buffer of NSTR.
- Similarly, the various welfare activities run by ITDA (Integrated Tribal Development Agency), Rural Development Dept. will be listed out and regular review and monitoring mechanism will be put in place for successful coordination.

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



Chapter – 6
Vision, Goals, Objectives and Problems



The main aims of demarcating and notifying a buffer zone are to absorb the impacts of human and developmental pressures and to conserve the inviolate core from all forms of biotic disturbance. The buffer area provides space for the establishment of territories and habitats by spillover populations of tigers in particular, and other wildlife in general, from the source populations of the core area. The concept of a buffer is to promote the coexistence of humans and wildlife.

6.1 VISION

"Conservation of the natural habitat to supplement the spillover tiger populations and its prey by mainstreaming wildlife concern in key production sectors in coordination with people and other Government Agencies/ line departments."

6.2 MANAGEMENT GOALS

Conservation and restoration of ecological integrity typical of the Nallamala landscape with a special emphasis on protecting and providing a suitable habitat for the Tigers and other wildlife spilling out of core areas of NSTR in perpetuity by involving local communities.

6.3 MANAGEMENT OBJECTIVES

1. Mainstreaming tiger (wildlife) conservation concerns in various production sectors by modification of developmental activities / practices to make them more conservation friendly.
2. To provide habitat supplement to the spillover population of tiger and its prey from the core area, conserved with the active cooperation of stakeholder communities.
3. Protection of buffer areas of Nagarjunasagar Srisailam Tiger Reserve and providing site specific habitat inputs for a viable population of tigers, co-predators and their prey without distorting the natural prey-predator ecological cycle in the habitat
4. Promotion of conservation education among various stakeholders and creating public awareness.
5. Mainstreaming wildlife concerns, especially to enhance protection against poaching near the fringe villages.
6. To monitor the status of the tiger, the flagship species in general and other threatened indicator species of flora and fauna in particular.
7. To provide site specific, need based, participatory eco-development inputs to various stakeholders for rationalizing their resource dependency on the Tiger Reserve and strengthen their livelihoods, so as to elicit their support for conservation of the area.
8. To advocate ecologically compatible land uses for addressing the livelihood concerns of local people and to restore the degraded habitats to provide sufficient habitat for spatial movement of spill-over species outside NSTR.
9. To encourage multi-disciplinary integrated research encompassing scientific and socio-economic aspects related to Tiger Reserve Management.
10. To ensure public support and participation in conservation through suitable measures, which are ecologically appropriate and yield sustainable benefits to them.
11. To promote conservation compatible Community Based Eco-tourism to benefit the tribal and the local communities in the form of employment opportunities and economic upliftment in order to promote sustainable development.
12. Improvement of management capacity of the staff in protection, conservation and monitoring.

6.4 PROBLEMS IN ACHIEVING OBJECTIVES

- The natural grasslands tend to follow the natural succession to become the woodlands until and unless managerial interventions are done. The basic issues are invasion of the grasslands by the weeds and woody species including *Cassia tora, Lantana camara, Eupatorium, Woodfordia fruticosa, Phoenix humilis*. This is a major problem to be tackled under habitat management.
- As far as the regeneration status of the forests in the buffer area of NSTR is concerned, it varies from the place to place. The Bamboo (*Dendrocalamus strictus*) regeneration is good in Markapur and Atmakur area where there is no biotic interference and it needs to be protected. In small patches near nalas the *Bambusa bambos* is also present and sporadic flowering is also noticed at places.
- The regeneration establishes naturally. The main threats to the vegetation are manmade fire, grazing, fuel, small timber and fodder requirement in fringe villages.
- Water scarcity is a problem in buffer areas of NSTR, especially during summer seasons and continuous drought for years together makes the situation still worse. The natural water sources dry up during summer and saucer pits are to be filled.
- The villages in the buffer and in the fringe with huge population depend upon natural resource for their day to day need like fuel wood, agricultural implements, food security, minor forest produce etc. on the buffer zone. The increasing population is putting added pressure on resources, causing degradation of forest and habitat.
- The cattle population around buffer is very high and the migratory cattle put more pressure on the reserve forests of buffer area for water and fodder.
- The areas are very large in certain beats that are having around 50 Sq.Km also, so reserve has to be reorganized and staff is to be increased to tackle the issues of smuggling, poaching and managerial aspects of Wildlife of the Buffer area. The available staffs are getting aged and not properly trained for all the activities. This concern has been addressed by recent recruitment drive.
- Collection of NTFP like Mahua, Chiranji, Honey, Gum, Amla, & Medicinal plants is mostly carried out in reserve forest of buffer area. The major threat is unscientific collection of NTFP in buffer area, which is degrading the habitat. Removal of fuel wood in reserve forests of buffer area involves lopping/cutting down of trees, at certain times. The collection of mahua, honey and grass often lead to forest fires.

- Poaching in the fringe villages for wildlife meat is a major threat.

6.5 Strengths-Weaknesses-Opportunities-Limitation (SWOT) Analyses

6.5.1 Strengths:

- An offshoot of the southern Eastern Ghats in the state of Andhra Pradesh, NSTR is located in the extremely beautiful, pristine cultural and natural landscape. Nagarjunasagar-Srisailam Tiger Reserve (NSTR) is the largest Tiger Reserve in India.
- NSTR (Rajiv Gandhi Wildlife Sanctuary and Gundla Brahmeswaram (GBM) Wildlife Sanctuary) provides an approach to landscape conservation, as it is contiguous with the Amrabad Tiger Reserve (Telangana) in the north (Nallamala Forest) and with Lankamalleswara Sanctuary and Sri Venkateswara National Park, extending southwards upto Tirupati.
- NSTR is connected to Seshachalam biosphere reserve through forested patches and three protected areas- Sri Lankamalleswaram Wildlife Sanctuary, Sri Venkestwara 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.
- NSTR has documented all individual tigers using unique Id. Pictures of phase IV tigers and other species are compiled and presented in the form of an album.
- The vast collection of museum specimens, ranging from plankton and invertebrates to mammals, in Srisailam Research Lab 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.
- Ecotourism management at NSTR is well developed, with ecotourism centres established at Bairluty, Thummalabailu, and Pacherla. NSTR also hosts a remarkable bio-park at Srisailam, where the evolutionary history of the animal kingdom is depicted, making it an excellent ecotourism site.
- The Tiger Conservation Foundation has adequate corpus fund which is managed well. The funds are utilised well by the management for the betterment of the Tiger Reserve. However, there is serious burden on TCF resources in the absence of non-disbursal of central and state funds for identified planned activities as per the TCP including the wages for protection watchers.
- There is no scarcity of water in the Tiger Reserve due to river Krishna which is the perennial water source and apart from it, large scale network of Bavis (Well) and Kuntas

(Ponds) are distributed in NSTR. There are numerous streams small and big which cover the entire tiger reserve, most of them join river Krishna ultimately. All the animals are dependent on the natural water sources and also artificial water sources developed by department, which are to be maintained and new water resources are being developed.

- The core and buffer are under the unified command of the Field Director. Such unified control is a major strength of management, as the reserve is large and spread across three districts of the state. Teamwork and coordination are now evident, ensuring the effective management of the Tiger Reserve.
- The Tiger Reserve has established Wildlife Dispensary for in-house management of rescued and stressed animals.
- The reserve has well connected wireless network across the Tiger Reserve.
- Anthropogenic disturbance are limited and especially GBM Wildlife Sanctuary is free from any habitations.
- Invasive species threat is minimal.
- Solid waste accumulated due to public roads passing through the TR and movement of pilgrims etc. has been effectively managed by the Tiger Reserve.
- Existing buffer is already a good habitat
- Deployment of local Chenchu tribals as Base Camp Protection Watchers, Tiger Trackers in wildlife monitoring.
- Good population of Tigers.
- Rough terrain, mostly undulating to minimize any possible poaching threats.

6.5.2 . Weakness:

- There are **69** villages in the buffer. There is a high dependency of the villagers on NSTR for fodder, fuelwood, NTFP and bamboo. This is peculiar problem of buffer with higher human population and bigger villages unlike Core.
- Thousands of cattle belonging to the scheduled tribes residing in Buffer area wander in the forests for fodder, it results in the 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 programmes are planned.
- Illegal fishing activities in the backwaters of the multipurpose dam that have been constructed across the River Krishna at Srisailam and Nagarjunasagar, forming large reservoirs within the boundaries of the core of Tiger Reserve, are a major concern.

Though joint operations by Amarabad Tiger Reserve (Telangana) and NSTR on common boundary along river Krishna have effective control but around 1000 families are dependent on the fishing in river Krishna within NSTR.

- Because there are various stakeholders in NSTR, notably the hydro-electric department, Integrated Tribal Development Agency (ITDA), the migrant fishing community and other resource users, possibility of conflict between the conservation interests and individual interests/ non- compatible developments.
- 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 (6-7 lakh) from Andhra Pradesh, Karnataka and Maharashtra visit these temples during Mahasivarathri and Ugadi, disturbing the habitat and wild animals, increasing the vehicle pressure, creating litter, intensifying man-animal conflict and generating forest fires. Controlling the pilgrimage is a biggest challenge to NSTR.
- The Dornala-Srisailam highway passes through the core of NSTR, posing a threat to the wildlife and habitat management.
- There are large stretches of *Bambusa arundinacea* clumps in the central part of the reserve. These stretches are a unique ecosystem of the Nallamalla Hills. Clump improvement works are not being taken up, and as a result a large number of clumps are dying and getting degraded due to congestion. This makes the area vulnerable to fire, and there is a severe threat to the habitat.
- The funds under the centrally sponsored scheme of Project Tiger are released late to the Tiger Reserve due to the LOC/PAO system of the State Government.
- High pressure from local cattle population.
- This area is a major pilgrimage station, hence there is a pressure from pilgrims during festival season that affects the buffer area of Tiger Reserve.

6.5.3 Opportunities:

- Improvement of habitat of the wildlife and wildlife population through intervention.
- Training / capacity building to the staff and stakeholders.
- Building infrastructure supporting staff quarters, Forest Guest Houses.
- Information Technology, Wireless, Telecommunication and Information Networking.
- Developmental, Soil & Moisture Conservation, Water Harvesting Structure, Nursery.
- Settlement of Chenchu hamlets helps in monitoring any outside intrusion.
- Large scope of utilizing the human resource potential from local tribal hamlets in protection and monitoring Core and buffer areas of NSTR.
- Large area of TR has promising potential of having good tiger population.

6.5.4 Threats:

- Human-Wildlife Conflict
- Annual forest fires during summer
- Poaching attempts for herbivore
- Scarcity of water
- Invasion of grassland by woody species and invasion by obnoxious weeds.
- Grazing / Migratory Cattle in reserve forests of buffer area
- Smuggling attempts/Bamboo mats / NTFP Collection.
- Biotic pressure / large population of human being and cattle around buffer and number of villages located adjoining to buffer.
- Poaching in fringe villages for meat.

CHAPTER – 7
Management Strategies



- It is evident from the results of tiger monitoring in NSTR over the last two decades—regarding tiger occupancy in forests, availability of wild prey, and low human impact on the habitat—along with published data on tiger ecology, demography, and information available from the NTCA, that good source populations of tigers are found in NSTR.
- There is a need for a buffer zone to accommodate the spillover population of tigers and prey species straying out of core areas in search of new habitats. At the same time, there is a responsibility to meet the genuine livelihood needs of fringe villages in order to gain their support for the cause of conservation. It is the need of the hour to involve local communities in management aspects, including decision-making, for the conservation of wildlife and the security of landscapes.
- Hence, to fulfill the above obligations for ensuring ecological security in general and conservation of entire landscape of NSTR and the wildlife in particular.
- Regarding the management of buffer zone, the participatory management approach with special focus on the eco-development has been recommended for the management of buffer zone of NSTR. This approach will not only win the confidence of people and public representatives, but also result in a win-win situation for wildlife and people.

Need for Buffer Zone:-

- The buffer zone also acts as a corridor for expanding and migrating populations of tigers and other wildlife, allowing movement from one sanctuary to a nearby sanctuary.
- For the eco-development inputs, that include biomass substitution (e.g. alternative fuels), biomass generation and forestry, eco-tourism, agriculture, watershed management, small irrigation, local livestock improvement, artisan and other site specific items as desired by the people, not having a deleterious effect on Protected Area resources.
- Reciprocation by the local people through specific measurable actions as per MOU for improving protection and conservation was expected in certain activities. Activities expected included restriction of illicit grazing, reducing fuel wood and small timber collection from Protected Area, increased participation in fire protection and anti-poaching efforts.
- Continuing and expanding the above approach, the following broad strategies are recommended for the management of buffer zone which has been notified around the NSTR for acting as habitat for spill over populations of wildlife from core area and act as a shock absorber of all stresses and strains.
- It is also to be noted that, buffer area is in reserved forests, all the restrictions imposed by the Honorable Supreme Court of India, Central Empowered Committee of Apex Court, Guidelines by the Government of India and State Government regarding the restrictions in the reserved forests will be fully applicable in this part of Buffer area, apart from the provisions of all Union and State Governments Forest laws and rules in force.

BUFFER AREA STATEMENT

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**

The broad management aspects for buffer area would include

1. Strengthening and Effective Management of Buffer Area by improving the infrastructure and human resources like

   - Identifying and establishing new base camps in the sensitive and vulnerable parts of buffer zone
   - Improvement of communication network like wireless system with permanent stations and handsets for information sharing and alertness
   - Improvement of transportation facilities in the buffer zone by providing jeeps and their maintenance
   - Employment of local people as protection watchers with proper training
   - Giving training on the wildlife law and investigation aspect to the staff working in buffer area
   - Strengthening the river patrolling and protection by providing boats and their maintenance
   - Providing arms and ammunition to staff with training
   - Providing resting huts in all over the buffer area for systematic perambulation of staff and protection watchers
   - Providing insurance coverage for all staff working in buffer zone as well as core area of tiger reserve

- Giving bonus marks for the service of staff in the tiger reserve including buffer zone while considering their promotion and other benefits
- Staff welfare activities like core and buffer area allowance, providing field gear like shoes, torch lights, medical kits, rain and winter gear for motivating and facilitating the staff

2. Addressing human-wildlife conflict issues with prompt actions.
3. Mainstreaming wildlife concerns
4. Ensuring public participation in Wildlife Conservation through Eco-development, Research and Monitoring
5. Conservation Awareness and Education
6. Enhancing Financial Allocation for ensuring sustainable fund flow
7. Integration of annual programs of Management Action Plan with other programs
8. The exotic (non- local) species shall not be planted
9. Monoculture should be avoided
10. Planting if necessary, will be taken up only after due verification of the area and mostly local NTFP species will be planted for the benefit of wildlife in improving the habitat and the food requirement. Bamboo saplings will be planted at appropriate places for habitat improvement. Bamboo (mullam bamboo) will be planted along stream banks for improvement of the wildlife habitat.
11. Beedi leaf collection will be permitted in the reserved forests of buffer area. However, fire will not be permitted to get fresh flush of leaves.
12. Bamboo coupes will be worked under strictly on silvicultural practices and taking extra precautions wherever necessary for conservation of wildlife in the reserved forests of buffer area.
13. Existing perennial water sources for wildlife shall be developed.
14. Vehicular traffic on high way passing through the Reserve shall be regulated.
15. No black top roads shall be laid; only existing tracks shall be improved but shall not be black topped.
16. The area shall strictly be protected from fire.

17. No grazing shall be permitted from outside cattle except fringe villages.
18. No intensive form of land use like mining, quarrying should be fostered in the buffer zone, and due care should be exercised while granting NOC to such activities in private/revenue areas, if any, included in the Buffer Zone
19. No 'clear felling' should be allowed in the Buffer Zone.
20. Community Based Eco-tourism activities in the buffer zone of Tiger Reserve to be encouraged as a component of eco-development activity, eliciting the active involvement of stakeholder communities.
21. Capacity building of frontline staff as well as Eco-development Committee members should be undertaken on a regular basis.
22. Employment generation for the local village communities through conservation activities like fire tracing, view line creation and maintenance, water resources development, fodder plots development, management of grasslands, approved silvicultural operations, removal weed growth etc.,
23. Strengthening data collection and population monitoring of tigers and other wildlife by providing census materials like POP, pads, materials for identification of wildlife, Cameras, GPS, Drone etc.,
24. Daily monitoring and estimation of wildlife at appropriate interval (wildlife estimation twice a year once in November and May to be taken up duly following All India Tiger Estimation Protocol) to be carried out to ensure adequate monitoring and suggesting further strategies for wildlife conservation.
25. No plantation activity, silvicultural activities like thinning and harvesting will be done in the Sanctuary part of buffer zone except for the habitat improvement as per the guidelines in force will be undertaken.

7.1. Delineation of Buffer Area and other zones with in Buffer area

The buffer zone may be divided in to the following zones

7.1.1. Protection Zone

- The entire buffer area is considered and included as protection zone as the entire buffer zone of the NSTR in all the four divisions of the Tiger Reserve consists of only forest areas.
- The protection activities include foot patrolling by staff and protection watchers, river patrolling, boundary perambulation, anti-snare drives, road patrolling during day and night, checking of vehicles, intelligence gathering and Wildlife and Forest crime prevention.

7.1.2. Production Zone

- The production zone comprises of the bamboo coupes in reserve forests of Buffer area of Project Tiger, Nandyal & Giddalur. There may be a proposal in future to declare these areas (including Bamboo coupe areas) falling in Giddalur Range of Project Tiger, Giddalur and Rudravaram Range of Project Tiger, Nandyal as Ahobilam Wildlife Sanctury (Including the areas falling in Onipenta and Porumamilla Ranges of Kadapa Division which are part of existing Tiger Corridor) as these areas have good tiger population and prey/herbivore density is also considerably high. Thus, these areas may also be declared as extended core in future. The harvesting of bamboo coupes in these areas shall not be taken in general in view of tiger presence. This will be taken up as per prescription of Working Plan along with permission of Prl.Chief Conservator of Forests, Wildlife in harmony with the supplementary guiding document issued by the NTCA.
- The working plan prescriptions for forest areas in the buffer zone shall be revised in harmony with the supplementary guidance document issued by the NTCA (XXX ANNEXURE) in view of wildlife concerns as tigers are dispersing to Buffer and Corridor areas from the Core area (Source population) and there is high density of herbivore population in these areas.

Table 6 - Bamboo Coupes in Buffer Areas of Project Tiger, Giddalur

Sl. No.	Division	Range	Section	Beat	Name of the Coupe	Details of BC-I (compt)	Details of BC-II (compt)	Details of BC-IIII (compt)

1	2	3	4	5	6	7	8	9
1	PT, Giddalur	DET Range, Giddalur	SR Peta	Uyyalawaada	Othimadugu	631, 632, 633, 634 (P)	653 (P), 654 (P), 662 (P), 642 (P), 643 (P)	641, 651, 650 (P), 642 (P)
2	PT, Giddalur	DET Range, Giddalur	Kothakota	Kothakota & Sandrapodu	Guvvalapenta	663 (P), 664 (P), 665 (P), 666 (P), 672 (P)	678, 669, 670 (P), 679 (P)	663, 654, 638
3	PT, Giddalur	DET Range, Giddalur	Diguvametta	Tunnel	Tunnel	685, 682, 680 (P), 681 (P), 679 (P)	684, 683, 671	680 (P), 681 (P), 686 (P)
4	PT, Giddalur	DET Range, Giddalur	SR Peta	Bodi	Bodi	644, 650 (P), 660 (P), 661 (P)	655, 654 (P), 662 (P), 661 (P), 656 (P), 646	638, 634 (P), 650 (P), 649 (P), 635 (P)
5	PT, Giddalur	DET Range, Giddalur	Velaglapaya	Bollupalli & Velagalapaya (W)	Turimella Plains	810, 819, 826	811, 816	820, 821, 822

Table 7 - Bamboo Coupes in Buffer Areas of Project Tiger, Nandyal

Sl. No.	Division	Range	Section	Beat	Name of the Coupe	Details of BC-I (compt)	Details of BC-II (compt)	Details of BC-IIII (compt)
1	2	3	4	5	6	7	8	9
1	Nandyal	Rudravaram	Rudravaram	Rudravaram West	Chillamanupenta	459, 460, 461, 462, 463	464, 467	465, 466
2	Nandyal	Rudravaram	Rudravaram	Medambavi East	Gorreguntha	449, 450, 458	451, 454, 457	452, 453, 455, 456
3	Nandyal	Rudravaram	Nuthala	Nuthala North	M.M. Chelama	436, 437, 438, 439, 440	430, 431, 432, 433, 434, 435	441, 442, 444, 445, 446, 443
4	Nandyal	Rudravaram	Ahobilam	Ahobilam North	Ahobilam	420, 421, 422, 423	424, 425, 426, 427	416, 417, 418, 419
5	Nandyal	Chelama	Pedddakabalur	Peddakambalur	Pachagundala	479, 480 & 482	478 & 481	471, 472, 473, 474, 475, 476 & 477
6	Nandyal	Chelama	Pacherla	Pacherla	Pacherla	489	490	491 & 492
7	Nandyal	Chelama	Pacherla	Pacherla	Dorabhavi	483 & 484	486 & 487	485 & 488
8	Nandyal	Chelama	Pedddakabalur	Kotakonda	Kotakonda	498 & 499	496 & 497	493, 494, 495, 500, 501 & 502

Monitoring & Evaluation:-

- Regular feedback from local village communities

- Improvement in socio economic conditions of local people
- Assessment of grazing pressure
- Assessment of fuel wood consumption
- Skill development and income generation
- Level of community participation in protection and development

7.1.3 Eco-Sensitive Zone

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) read with sub-rule (3) of rule 5 of the Environment (Protection) Rules, 1986, the Central Government notified an area to an extent varying from 0 (zero) to 26 kilometers around the boundary of Nagarjunasagar Srisailam Tiger Reserve, in erstwhile Prakasam, Kurnool and Guntur Districts in the State of Andhra Pradesh as the Nagarjunasagar Srisailam Tiger Reserve Eco-sensitive Zone vide Indian Gazette No. 4022, Part-II–Section-3– Subsection (ii), Extraordinary, dated October, 21, 2021. The copy of Gazette notification is appended.

7.2 ZONE AND THEME PLAN APPROACHES TO MANAGEMENT STRATEGIES

7.2.1. ZONE PLAN- ECOTOURISM

7.2.1.1. Objectives of Eco-tourism:

The main objective of managing this Tiger Reserve is the in-situ conservation of tigers and their habitat. Tourism is only a byproduct of conservation goals. Traditional forms of tourism are not acceptable in wildlife areas; therefore, the concept of eco-tourism is promoted in wildlife conservation areas.

According to the definition and principles of Eco-tourism as established by the International Eco-Tourism Society (IETS),Ecotourism is “responsible travel to natural areas that conserves the environment and improves the wellbeing of local people”. So, the Eco-Tourism activities should follow the following principles-

- Minimize the impact.

- Build environment and cultural awareness.
- Provide positive experience 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 principles in letter and spirit, detailed Eco-tourism Plan which provides for the strategies to be adopted as per NTCA guidelines dated 15th October 2012 is prepared.

7.2.1.2. Regulation of tourism in Eco-Tourism zone of Buffer of NSTR:

As per Eco-tourism Plan, ecotourism is permitted for low impact eco-tourism and following regulations have been prescribed.

- Buffer 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.

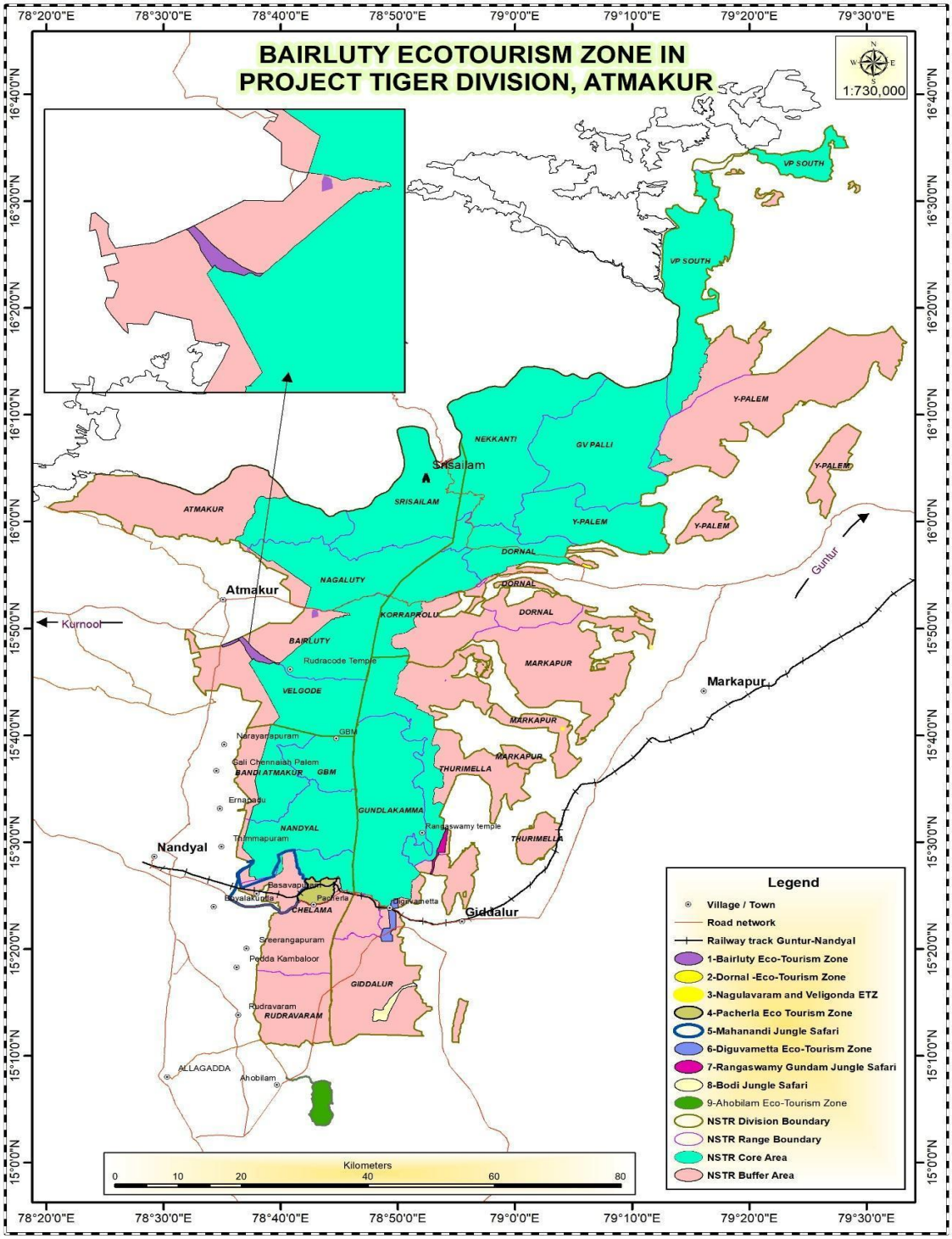
Cordoning, luring, or feeding of any wildlife in eco-tourism zone by any person is prohibited.

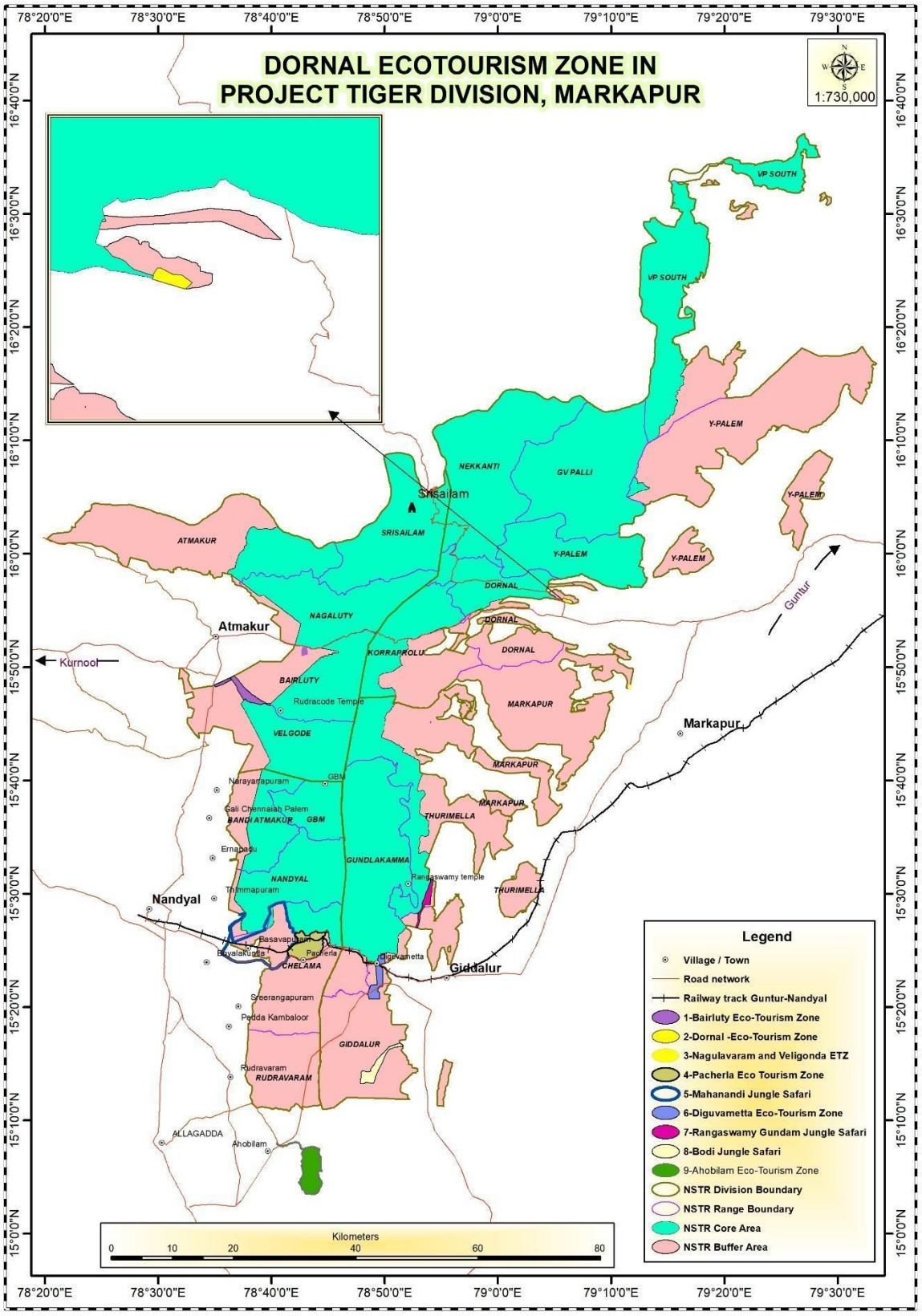
Table 8: Eco-tourism Zone proposed for Buffer area

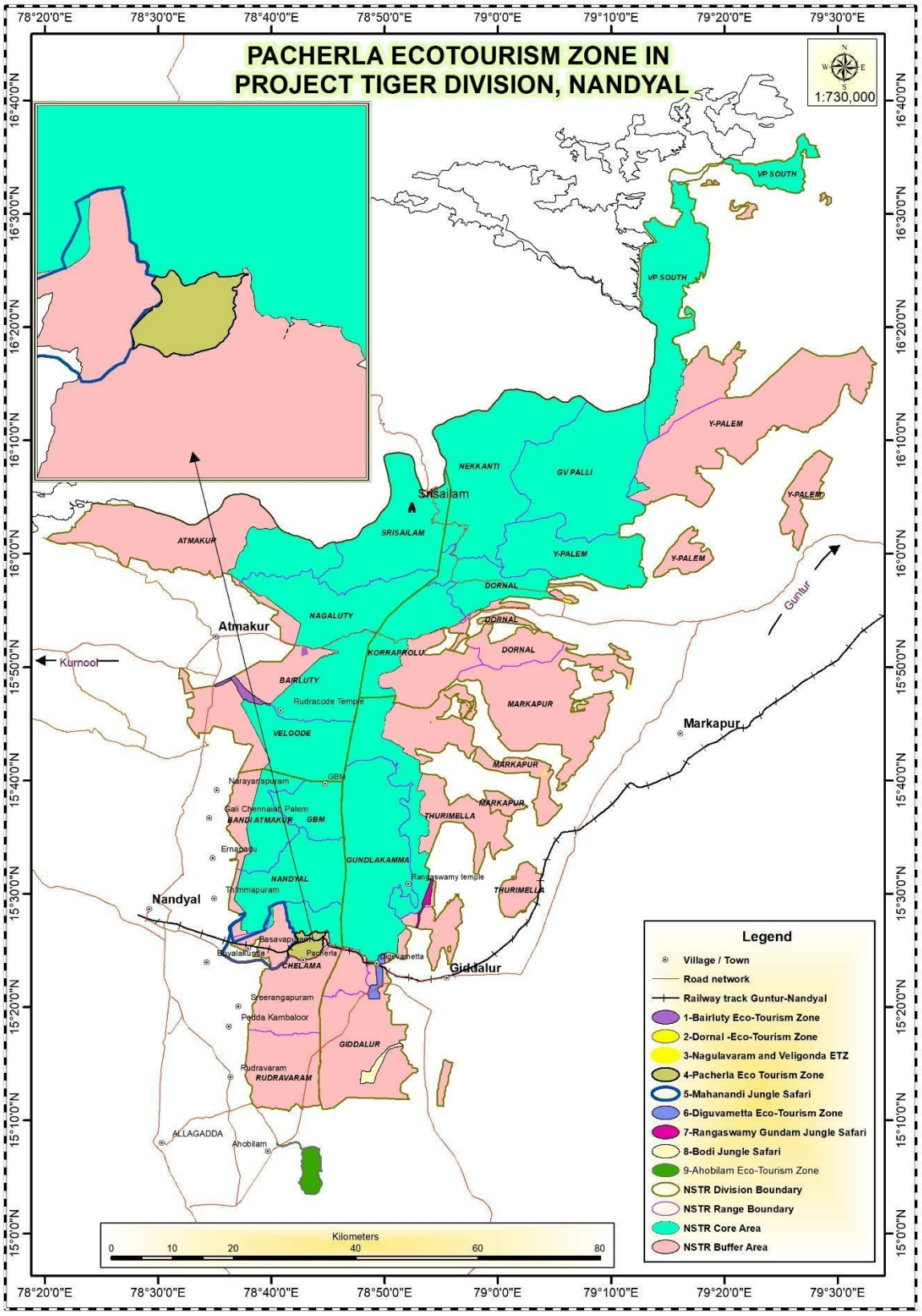
Sl. No.	Tourism Zone	Tourism Site	Range & Division	Status of area
1	Bairluty Eco-Tourism Zone	Bairluty, Velgode and Rudracode	Nagaluty, Bairluty and Velgode Ranges of PT Atmakur	Buffer area of NSTR

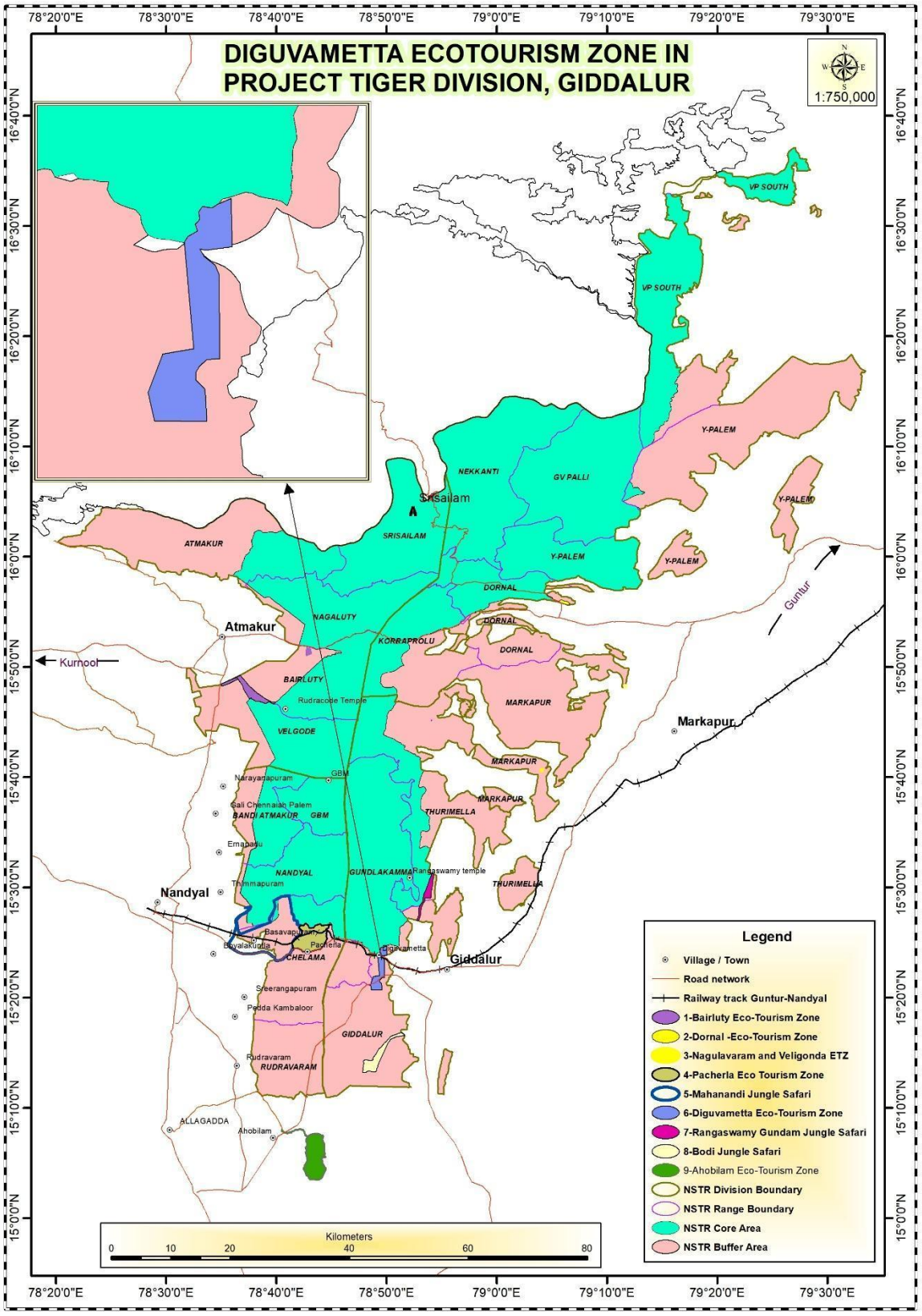
2	Dornala Eco-Tourism Zone	Dornala	Dornala Range of PT Markapur	Buffer area of NSTR
3	Pacherla Eco-Tourism Zone	Pacherla and Mahanandi Jungle Safari	Chelama and Nandyal Ranges of PT Nandyal	Buffer area of NSTR
4	Diguvametta Eco-Tourism Zone	Diguvametta	Gundlakamma and Turimella Range of PT Giddalur	Buffer areas of NSTR
5	Rangaswamy Gundam Eco-Tourism Zone	Mokallakuruva	Gundlakamma and Turimella Range of PT Giddalur.	Buffer areas of NSTR
6	Ahobilam Eco-Tourism Zone	Ahobilam	Rudravaram Range of PT Nandyal	Buffer area of NSTR

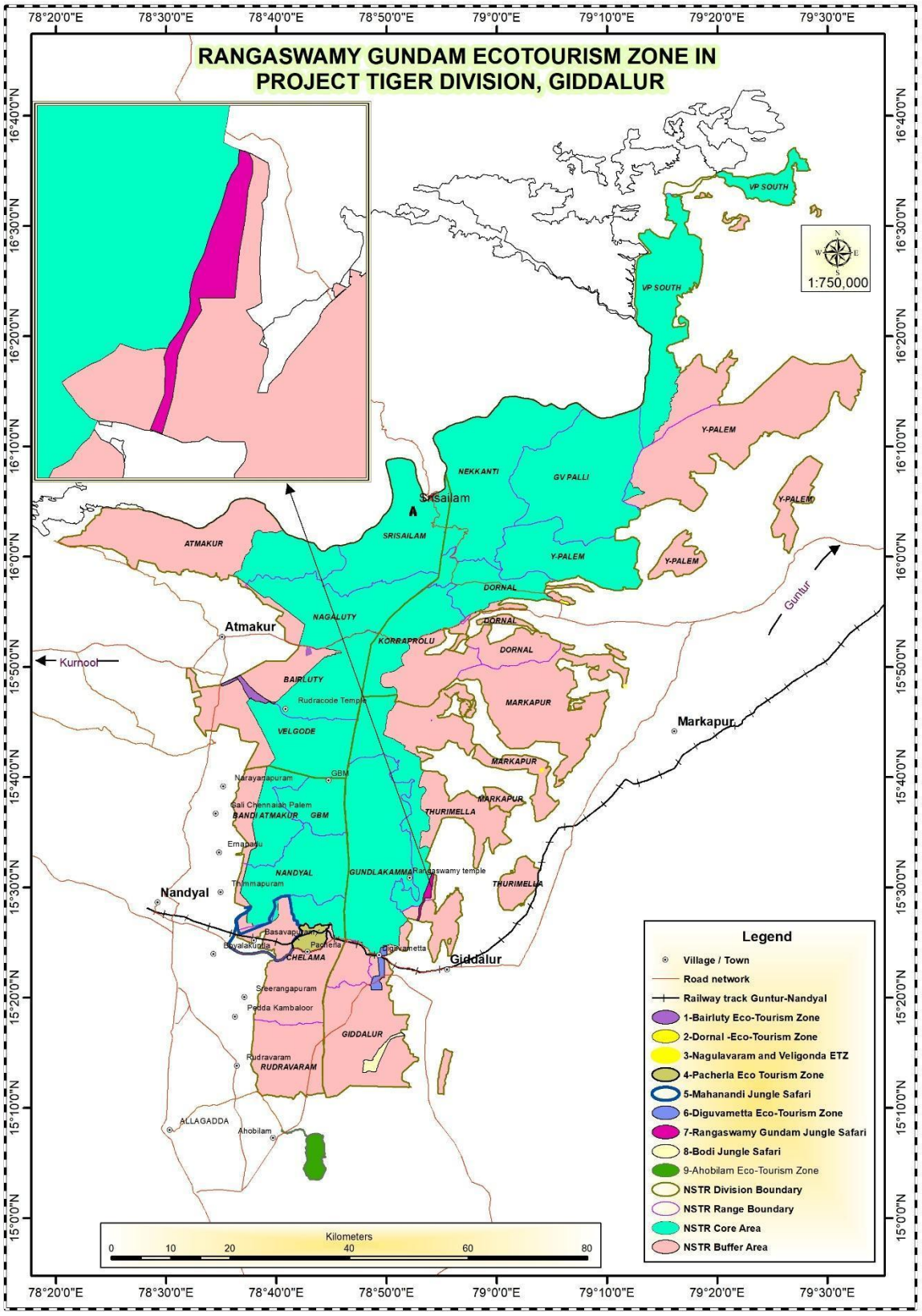
Map 10:– Map showing ecotourism zones in NSTR

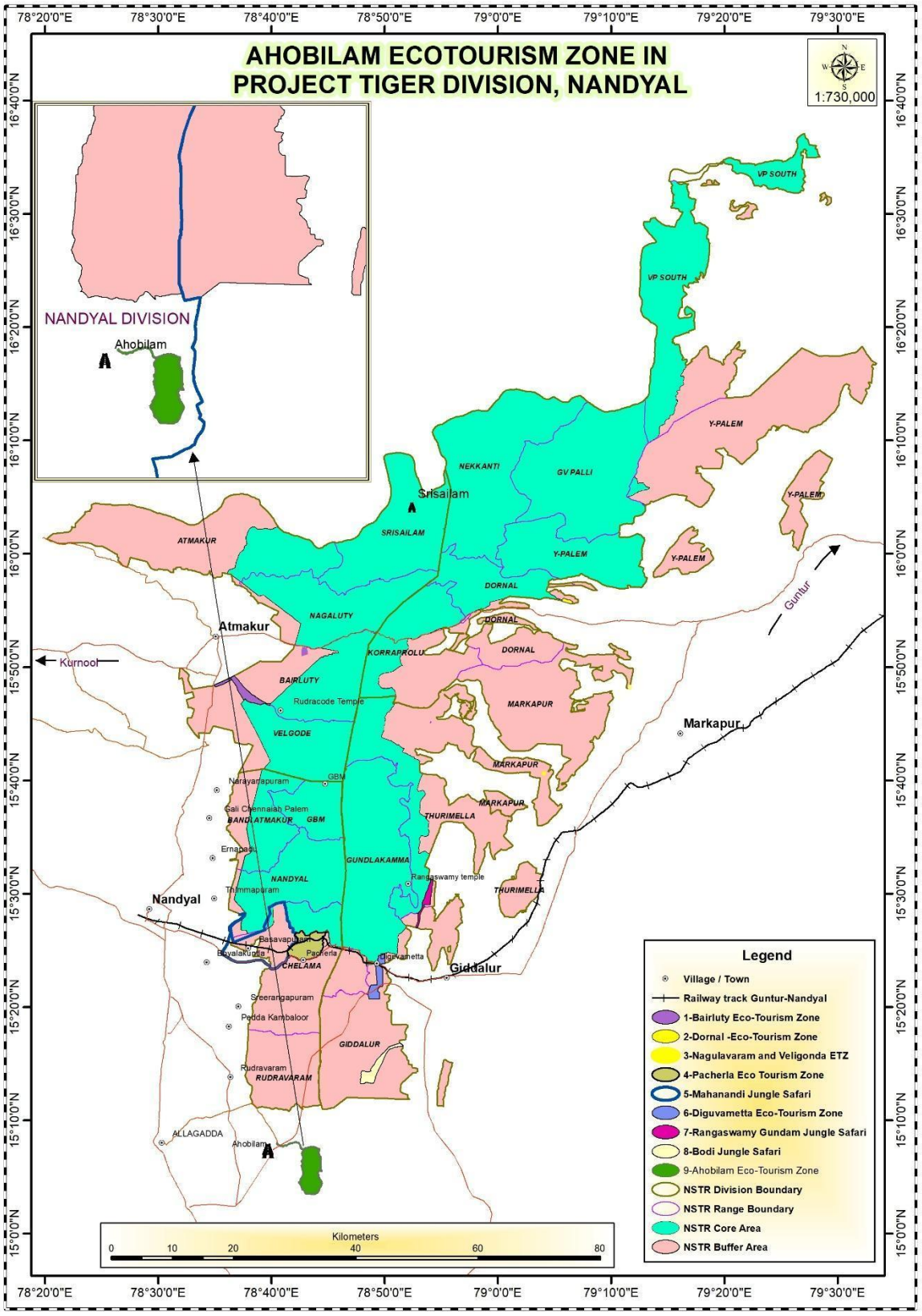



DORNAL ECOTOURISM ZONE IN
PROJECT TIGER DIVISION, MARKAPUR
1:730,000
78°20'0"E
78°30'0"E
78°40'0"E
78°50'0"E
79°0'0"E
79°10'0"E
79°20'0"E
79°30'0"E
16°40'0"N
16°30'0"N
16°20'0"N
16°10'0"N
16°0'0"N
15°50'0"N
15°40'0"N
15°30'0"N
15°20'0"N
15°10'0"N
15°0'0"N
VP SOUTH
Y-PALEM
NEKKANTI
GV PALLI
Srisailam
SRISAILAM
ATMAKUR
DORNAL
NAGALUTY
Atmakur
Kurnool
KORRAPROLU
BAIRLUTY
Rudracode Temple
VELGODE
MARKAPUR
Markapur
Guntur
Narayanapuram
GBM
Sali Chennaiah Palem
BANDI ATMAKUR
THURIMELLA
Ernapadu
GUNDLAKAMMA
NANDYAL
Tammapuram
Rangaswamy temple
Nandyal
Basavapuram
Bayalakuntla
Pagideria
CHELAMA
Diguvametta
Giddalur
Sreerangapuram
Pedda Kambaloor
GIDDALUR
Rudravaram
RUDRAVARAM
ALLAGADDA
Ahobilam
Kilometers
0
10
20
40
60
80
Legend
Village / Town
Road network
Railway track Guntur-Nandyal
1-Bairluty Eco-Tourism Zone
2-Dornal -Eco-Tourism Zone
3-Nagulavaram and Veligonda ETZ
4-Pacherla Eco Tourism Zone
5-Mahanandi Jungle Safari
6-Diguvametta Eco-Tourism Zone
7-Rangaswamy Gundam Jungle Safari
8-Bodi Jungle Safari
9-Ahobilam Eco-Tourism Zone
NSTR Division Boundary
NSTR Range Boundary
NSTR Core Area
NSTR Buffer Area


PACHERLA ECOTOURISM ZONE IN
PROJECT TIGER DIVISION, NANDYAL
1:730,000
78°20'0"E
78°30'0"E
78°40'0"E
78°50'0"E
79°0'0"E
79°10'0"E
79°20'0"E
79°30'0"E
16°40'0"N
16°30'0"N
16°20'0"N
16°10'0"N
16°0'0"N
15°50'0"N
15°40'0"N
15°30'0"N
15°20'0"N
15°10'0"N
15°0'0"N
VP SOUTH
Y-PALEM
NEKKANTI
GV PALLI
SriSailam
SRISAILAM
ATMAKUR
DORNAL
NAGALUTY
Atmakur
Kurnool
KORRAPROLU
BAIRLUTY
Rudracode Temple
VELGODE
MARKAPUR
Markapur
Guntur
Narayanapuram
GBM
Sali Chennaiah Palem
BANDI ATMAKUR
THURIMELLA
Ernapadu
GUNDLAKAMMA
NANDYAL
Rangaswamy temple
Tammapuram
Nandyal
Basavapuram
Bayalakuntla
Pagidela
CHELAMA
Diguvametta
Giddalur
Sreerangapuram
Pedda Kambaloor
GIDDALUR
Rudravaram
RUDRAVARAM
ALLAGADDA
Ahobilam
Kilometers
0
10
20
40
60
80
Legend
Village / Town
Road network
Railway track Guntur-Nandyal
1-Bairluty Eco-Tourism Zone
2-Dornal -Eco-Tourism Zone
3-Nagulavaram and Veligonda ETZ
4-Pacherla Eco Tourism Zone
5-Mahanandi Jungle Safari
6-Diguvametta Eco-Tourism Zone
7-Rangaswamy Gundam Jungle Safari
8-Bodi Jungle Safari
9-Ahobilam Eco-Tourism Zone
NSTR Division Boundary
NSTR Range Boundary
NSTR Core Area
NSTR Buffer Area


DIGUVAMETTA ECOTOURISM ZONE IN
PROJECT TIGER DIVISION, GIDDALUR
1:750,000
78°20'0"E
78°30'0"E
78°40'0"E
78°50'0"E
79°0'0"E
79°10'0"E
79°20'0"E
79°30'0"E
16°40'0"N
16°30'0"N
16°20'0"N
16°10'0"N
16°0'0"N
15°50'0"N
15°40'0"N
15°30'0"N
15°20'0"N
15°10'0"N
15°0'0"N
VP SOUTH
Y-PALEM
NEKKANTI
GV PALLI
Srisailam
SRISAILAM
ATMAKUR
DORNAL
NAGALUTY
KORRAPROLU
Atmakur
Kurnool
BAIRLUTY
Rudracode Temple
VELGODE
MARKAPUR
Markapur
Guntur
GBM
Narayanapuram
Gali Chennaiah Palem
BANDI ATMAKUR
Emapasu
NANDYAL
GUNDLAKAMMA
Rangaswamy temple
THURIMELLA
Nandyal
Thimmapuram
Basavapuram
Bovalakuntla
Pacherla
CHELAMA
Diguvametta
Giddalur
Sreerangapuram
Pedda Kambaloor
GIDDALUR
Rudravaram
RUDRAVARAM
ALLAGADDA
Ahobilam
Kilometers
0
10
20
40
60
80
Legend
Village / Town
Road network
Railway track Guntur-Nandyal
1-Bairluty Eco-Tourism Zone
2-Dornal -Eco-Tourism Zone
3-Nagulavaram and Veligonda ETZ
4-Pacherla Eco Tourism Zone
5-Mahanandi Jungle Safari
6-Diguvametta Eco-Tourism Zone
7-Rangaswamy Gundam Jungle Safari
8-Bodi Jungle Safari
9-Ahobilam Eco-Tourism Zone
NSTR Division Boundary
NSTR Range Boundary
NSTR Core Area
NSTR Buffer Area


RANGASWAMY GUNDAM ECOTOURISM ZONE IN
PROJECT TIGER DIVISION, GIDDALUR
1:750,000
Srisailam
Atmakur
Kurnool
Markapur
Giddalur
Nandyal
Guntur
Rudracode Temple
Rangaswamy temple
Narayanapuram
Gali Chennaiah Palem
Emapasu
Thimmapuram
Basavapuram
Boyalakuntla
Pacherla
Diguvametta
Sreerangapuram
Pedda Kambaloor
Rudravaram
ALLAGADDA
Ahobilam
VP SOUTH
Y-PALEM
NEKKANTI
GV PALLI
SRISAILAM
ATMAKUR
DORNAL
NAGALUTY
KORRAPOLU
BAIRLUTY
VELGODE
MARKAPUR
THURIMELLA
NANDYAL
GUNDLAKAMMA
CHELAMA
GIDDALUR
RUDRAVARAM
BANDI ATMAKUR
GBM
Kilometers
0 10 20 40 60 80
Legend
Village / Town
Road network
Railway track Guntur-Nandyal
1-Bairluty Eco-Tourism Zone
2-Dornal -Eco-Tourism Zone
3-Nagulavaram and Veligonda ETZ
4-Pacherla Eco Tourism Zone
5-Mahanandi Jungle Safari
6-Diguvametta Eco-Tourism Zone
7-Rangaswamy Gundam Jungle Safari
8-Bodi Jungle Safari
9-Ahobilam Eco-Tourism Zone
NSTR Division Boundary
NSTR Range Boundary
NSTR Core Area
NSTR Buffer Area
78°20'0"E
78°30'0"E
78°40'0"E
78°50'0"E
79°0'0"E
79°10'0"E
79°20'0"E
79°30'0"E
16°40'0"N
16°30'0"N
16°20'0"N
16°10'0"N
16°0'0"N
15°50'0"N
15°40'0"N
15°30'0"N
15°20'0"N
15°10'0"N
15°0'0"N

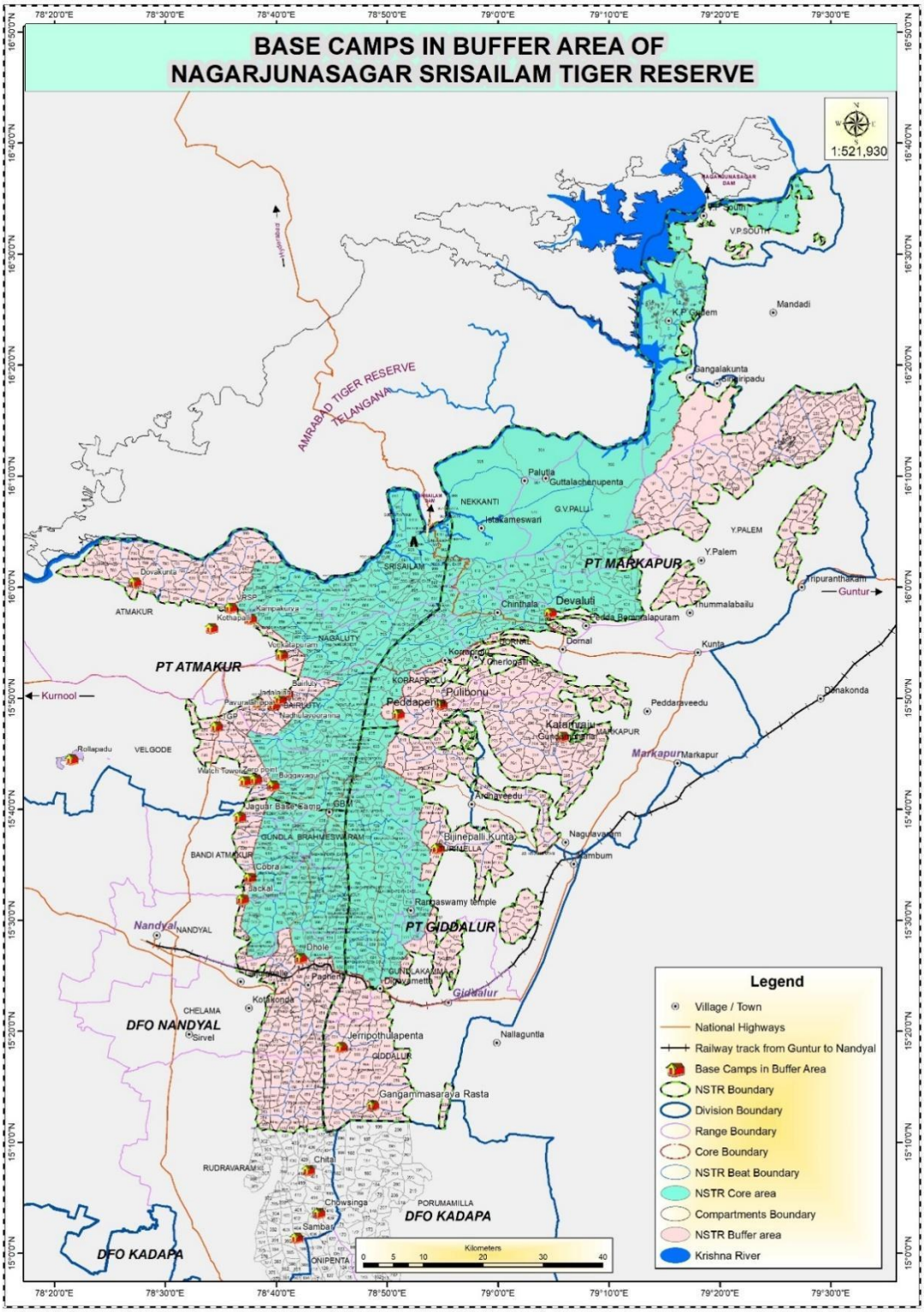

AHOBILAM ECOTOURISM ZONE IN
PROJECT TIGER DIVISION, NANDYAL
1:730,000
NANDYAL DIVISION
Ahobilam
Srisailam
Atmakur
Kurnool
Markapur
Giddalur
Nandyal
Guntur
Rudracode Temple
Rangaswamy temple
Legend
Village / Town
Railway track Guntur-Nandyal
1-Bairluty Eco-Tourism Zone
2-Dornal -Eco-Tourism Zone
3-Nagulavaram and Veligonda ETZ
4-Pacherla Eco Tourism Zone
5-Mahanandi Jungle Safari
6-Diguvametta Eco-Tourism Zone
7-Rangaswamy Gundam Jungle Safari
8-Bodi Jungle Safari
9-Ahobilam Eco-Tourism Zone
NSTR Division Boundary
NSTR Range Boundary
NSTR Core Area
NSTR Buffer Area
Kilometers
0 10 20 40 60 80

7.2.2. THEME PLAN

7.2.2.1. THEME PLAN I: PROTECTION MEASURES IN BUFFER

1. Identifying and establishing new base camps in the sensitive and vulnerable parts of buffer zone.
2. Engaging of local tribals as animal trackers and base camp protection watchers.
3. Strengthening the existing base camps with semi permanent structures, solar light systems, wireless connectivity and improving water availability.
4. Improvement of communication network like wireless system with permanent stations and handsets for information sharing and alertness.
5. Improvement of transportation facilities in the buffer zone by providing jeeps and two wheelers and their maintenance.
6. Employment of locals as protection watchers under various schemes and utililising their full potential for protection with systematic training and perambulation activities.
7. Giving training on the wildlife law and investigation aspect to the staff working in buffer area for effective control of crime and successful prosecution of offenders
8. Strengthening the river patrolling and protection by providing boats and their maintenance with safety field gear like life jackets, etc
9. Providing arms and ammunition to staff with training for creating fear among the criminals not to indulge in wildlife crimes.
10. Providing resting huts in all over the buffer area for systematic perambulation of staff and protection watchers to avoid monotony and multiple inspections of areas.
11. Providing insurance coverage for all staff working in buffer zone as well as core area of tiger reserve
12. Giving special remarks in the Annual Confidential Reports for the service of staff in the tiger reserve including buffer zone while considering their promotion and other benefits.
13. Staff welfare activities like core and buffer area allowance, providing field gear like shoes, torch lights, medical kits, rain and winter gear, for motivating and facilitating in both Core and Buffer area.
14. Engaging base camp protection watchers from fringe villages falling in buffer areas for effective protection

Map 11: Base Camps existing in Buffer of NSTR



Fire Management:

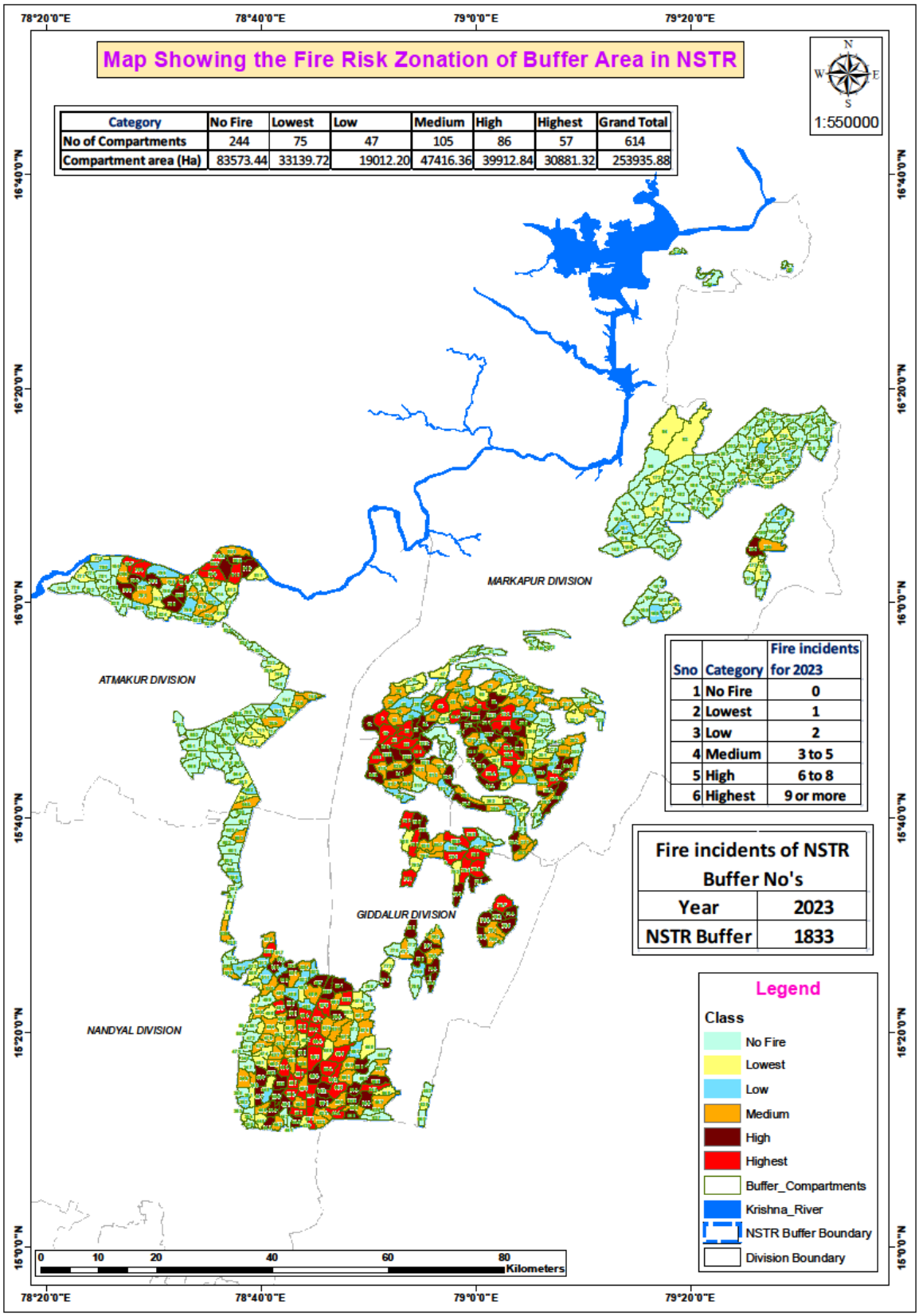
The buffer areas of the Nagarjunasagar Srisailam Tiger Reserve consist of dry deciduous forests with grasses in the understory and are prone to fire. The following characteristics have been observed, and corresponding prescriptions are made:

1. Fires in Nallamalais generally are ground borne with low intensity and of little risk to human and large animal life. This is because local miscellaneous species do not hold much flammable oil in their leaves and bark. Thus, fires are not carried to the canopy of the forests. Under stories are mostly dominated by grasses which provide the major fuel for fires.
    a. Generally, no natural fires occur in the Tiger Reserve buffer area, and it also does not experience fires by lightning.
    b. Mostly the fires are man-made and ground borne. It burns all the leaf litter, hardly leaves any chance for the humus to develop.
    c. Summer fires have become common feature in these dry deciduous forests from January to mid June every year.
    d. These fires have the following deleterious effects on the ecology of the buffer zone.
        i. Fires immediately result in the removal of dry, coarse, and fibrous material
        ii. Fires kill or partly destroy seedlings, saplings and shrubs,
        iii. Fires kill the soil micro flora and fauna –the most important agents of building humus, aeration and nutrients of the soil.
    e. Fires are ignited by the people for clearing of forest floor for easy collection of NTFP especially Nannari, and to get new flush of grass shoots and leaves, especially in reserve forests of buffer area.
    f. The existence of a public highway through the middle of the buffer and core area makes it further vulnerable for man made fires.
2. 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.
    - The Fire Risk Zonation map is available with the GIS cell for the entire buffer area which will be extensively used for identification of fire prone areas.

- Surveillance of fire from watch towers and by patrol parties.
- The cutting and burning of specially created fire lines 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 sweeping and 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.
- Strip clearance by the fire extinguishing squad
- Manual putting out off the fire by using fire beaters
- Counter firing by the squads
- Communicating the fire outbreak news to fire parties

3. Counter fire is the best method of controlling fire. 5 meter wide Fire 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.
4. Cool burning is advisable during November and December under the close supervision of the concerned Section and Beat officers. The methodology is described in the fire line maintenance and fire fighting guidelines of state government.
5. Local people to be given incentives such as cash rewards for controlling fires. Each forest village shall be given an incentive reward in kind to a tune of Rs. 5000 if fires do not occur in the forest around their village up to 5 km. radius.

Map 12:– Map showing Fire Risk Zonation of Buffer Area of NSTR



Category	No Fire	Lowest	Low	Medium	High	Highest	Grand Total
No of Compartments	244	75	47	105	86	57	614
Compartment area (Ha)	83573.44	33139.72	19012.20	47416.36	39912.84	30881.32	253935.88

Sno	Category	Fire incidents for 2023
1	No Fire	0
2	Lowest	1
3	Low	2
4	Medium	3 to 5
5	High	6 to 8
6	Highest	9 or more

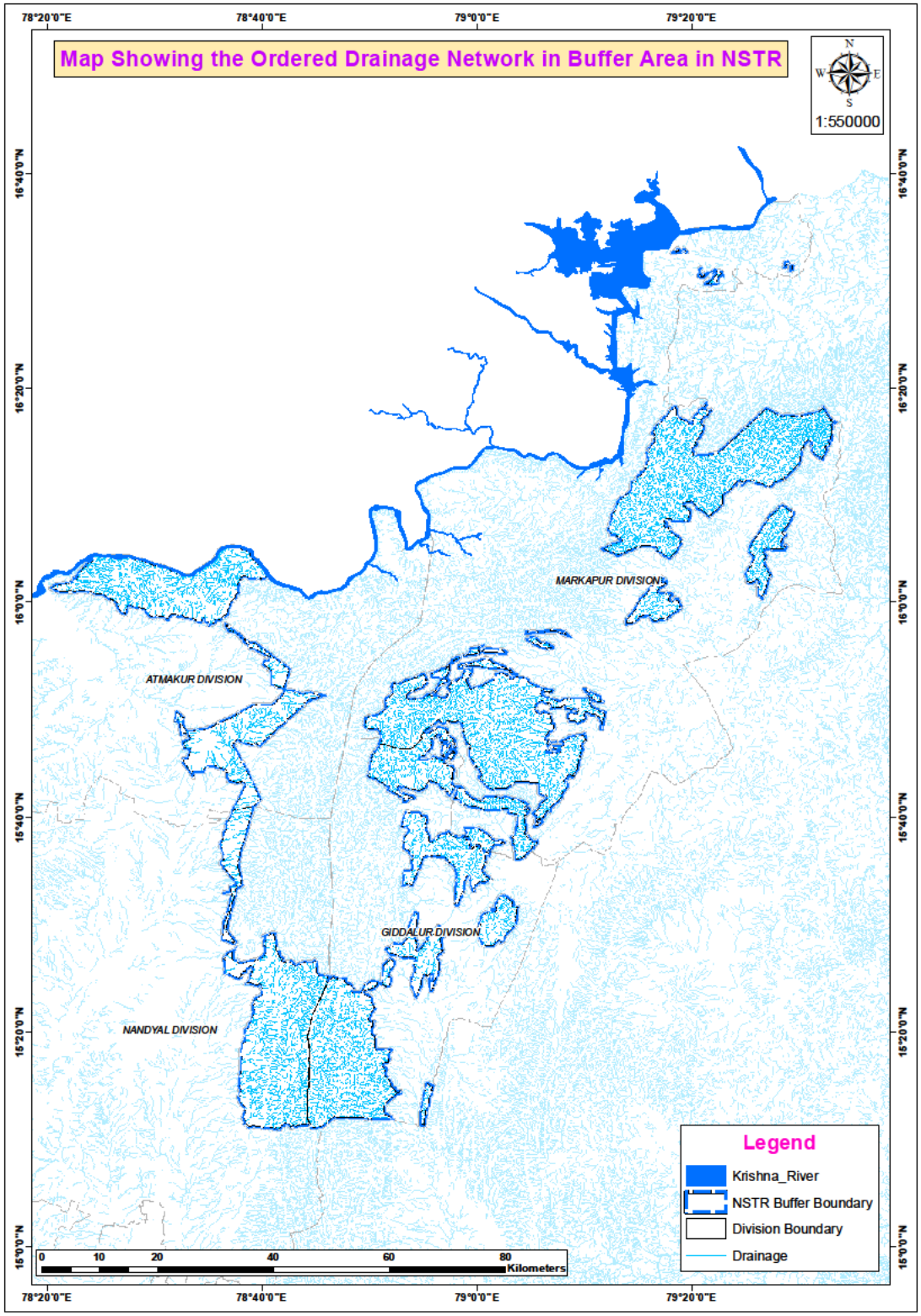
Fire incidents of NSTR Buffer No's	
Year	2023
NSTR Buffer	1833

7.2.2.2. THEME PLAN II: Water Resources Management:

Water is called elixir of life and more so in Nagarjunasagar Srisailalm Tiger Reserve (NSTR). During summer months, NSTR faces acute water shortage in many areas of its Buffer 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.

1. Water is an important constraint especially during the summer months and becomes a limiting factor during the “pinch period”.
2. Areas where water becomes limiting factor have been identified. In such areas water development works like impounding, construction of pickups, small anicut have already been taken up under various projects.
3. Low cost structures like small earthen bund tanks and seepage springs have to be developed.
4. Buffer 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) of atleast 200-300 no. may be planned in next 5 years so as to make the buffer area water surplus, 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.
5. New water holes may be created close to the tree cover, as water holes devoid of cover do not attract wild animals.
6. Annual de-silting of water holes to be carried out as is practice for the last two plan periods.
7. A key factor in the restoration or rehabilitation of land is the good management of all the water it receives. The need for water is felt acutely in areas with low rainfall, erratic monsoon rains and of frequent monsoon failures.

Map 13:– Map showing Drainage Network in Buffer Area of NSTR



7.2.2.3. ZONAL PLAN III: Habitat Management in Buffer Area

Following interventions will be taken up, keeping in view that the area would be kept sub-optimal to the core judicious enough to promote wildlife and tiger dispersal. The activities should be only the regular scheduled forestry activities harmonized with respect to the supplementary guidelines of NTCA.

7.2.2.3.1. Grassland/Woodland Management:

Grass species available in Buffer Area of Nagarjunasagar Srisailam Tiger Reserve are 1) *Cynodon dactylon* 2) *Cyperus* species, 3) *Dicanthium annulatum*, 4) *Themeda* sp. etc.

Problems in grassland management:

1) **Invasive species** like *Lantana, Eupotorium* and *Cassia tora* occupy approximately 20 – 25 % of the area as an undergrowth and in the open places. These two species have devastating effect on the fodder resource.
2) **Live stock of the surrounding villages is major problem.**

Management Prescriptions:

The most frequent practice of weed eradication in wildlife area of Andhra Pradesh is uprooting.

- The uprooting operation should be carried out prior to fruiting and just after the heavy showers in monsoon season when the soil is moist, so that uprootal will become easy.
- The uprooted weed should be stacked properly for decomposition and for the inspection of the areas.
- Sites of steep slopes should be avoided because uprooting of weed may cause soil erosion in the area.
- These two weed species to be removed in the phased manner and the areas to be monitored continuously of the development of the areas with palatable species.
- Weed eradication activities in a particular compartment should be repeated for minimum of (3) years continuously to eliminate the chances of their re-appearance either by left out roots or through seeds.

3) Removal of Lantana and other invasive species:

The concentrated patches of weeds like *Lantana, Eupotorium* and *Parthenium* are present in buffer areas of all the divisions. *Lantana* to be removed in sporadic patches only and *Lantana* found in gregarious patches will be kept as such**.**

The following methodology will be followed.

- Survey and enumeration of the area through GPS. At places, patches of *Lantana* may be retained for the cover requirement of wildlife, nesting requirement of birds and food requirement of sloth bear, herbivores and birds.
- The concentrated patches of *Eupotorium* and *Parthenium* have to be removed totally.
- The removal has to be done by uprootal preferably after a heavy shower in the month of June – September before flowering /seeding when the soil is loose and uprootal is easier by picking.
- The removal in an area has to be done in patches and stacked in open places allowing to decay (for *Eupotorium* and *Parthenium*) are for cool burning before November.
- In open areas and disturbed soil areas, local grass species or seed may be sown.
- The area has to be revisited every year continuous for four years and should be maintained for weed removal if weed is coming up.

Monitoring:-

- Monitoring of impact of every habitat improvement input is carried out according to the established guidelines to assess the impact of such intervention on habitat quality. As a measure of habitat improvement activity, weed eradication operation and its impacts are continuously monitored in suitable intervals. A field observation format will be developed for monitoring purposes.
- Regeneration status of palatable grass species is obtained through Random sampling in 20 x 20 m sample plots in 200 x 200 m intervals.
- Increased visitation of herbivores (enhanced utility of habitat) can be observed by comparison of direct sighting and indirect counts, like dung/ pellet count in 20 x 2 m or 2m radius circular random or systematic sample plots.

4) Removal of Phoenix species:

Phoenix spp (*Phoenix robusta*) is approximately spread over more than 25000 ha of NSTR which is smothering local grass species and it is also fast spreading in Core area of NSTR

and due to frequent forest fires. Wild animals such as Bear, Sambar, Civet, Chital etc., also eat the fruits of Phoenix fruits, which is also resulting in spread of Phoenix spp in NSTR. Removal of Phoenix spp may be taken up gradually so that local grass species can be restored.

7.2.2.3.2. Water Management Plan:

The identified water sources have to be developed by taking up works like desiltation, removal of leaves and other debris from the natural water holes, construction of check dams/ check walls across identified perennial streams. Small earthen bunds / mini percolation tanks and seepage strings shall also be developed at strategic points.

Water is a crucial factor in wildlife management. It is an important parameter for deciding the habitat suitability of any area. Its presence, absence, extent, duration not only controls the vegetation type and species composition but also governs the extent and intensity of habitat utilization by the existing population.

Objectives:

1. Creation and maintenance of waterholes in water scarce area is for increasing the utilization capacity of all habitats by the wildlife.
2. Improvement of the design of the waterholes so as to suit all kinds of wildlife and also merge with the surroundings.
3. To provide water to the wild animals at least one place in 15-20 sq.km preferably through management of natural water holes.

Management of Waterholes:

- It is essential to maintain the old water holes regularly so that they serve as sources of water.
- For that regular monitoring of each of the water holes is essential. The works that need to be carried out are de-silting, deepening, clearing of weed growth in the catchment area, cleaning and pitching of inflow channels, etc.
- Range and beat-wise maps indicating natural and artificial waterholes would be prepared and supplied to the staff. These maps would guide staff for maintenance of waterholes.

Design of Artificial Waterholes:-

As far as possible, a good design which can merge with the nature and surrounding forests be chosen for the purpose. Preferably the natural bund areas are selected and the design should also take into consideration the requirements of different wild animals say wallowing of sambar, peacocks and birds, tigers, small carnivores and other ungulates. The percolation tanks are preferred than the check dams and requirement and length of water availability in the proposed area is the main criteria for the selection.

Monitoring and Evaluation:

Changes in availability of water in natural as well as artificial waterholes should be monitored and recorded regularly. Special monitoring and field inspection is necessary during drought to ensure proper maintenance of waterholes. Monitoring of natural water holes throughout the year in every month in terms of availability of water will give an indication about the water management in the area.

Check Dams:-

Check dams will be constructed across interior seasonal streams to retain water for catering the needs of wild animals. Check dams will be constructed at appropriate place to store water, stop soil erosion etc., when necessary. The output map of GIS cell will be utilized for the purpose. The field and utility survey has to be done by Assistant Conservator of Forests / Forest Range Officer and report submitted.

The repair to the existing check dams will be done only after the report furnished by Assistant Conservator of Forests / Forest Range Officer.

Percolation Tanks:- In the past, Percolation Tanks have been constructed in many places. The repair and strengthening of bund will be taken up after due verification.

Artificial C.C. Saucers

- After due attempting for the provision of water for the animals in the buffer, still some area remains in the buffer of reserve where neither natural nor artificial water hole exists and there may not be any possibility of provision of water with above methodology.
- Maintenance of saucers will be taken up every year to provide water to the wild animals during pinch season in fringe areas to prevent wild animals to stray into the habitations.

Installation of hand pumps and saucers:

Due to acute shortage of surface water, this strategy can be adopted to provide water to saucer pits by drilling bore well and fitting with hand pump, and pumping water to the saucer. Such provision can be made in the forest areas in the fringe to provide water to the wild animals after careful selection of the site and in the village for the village cattle as an eco-development initiative.

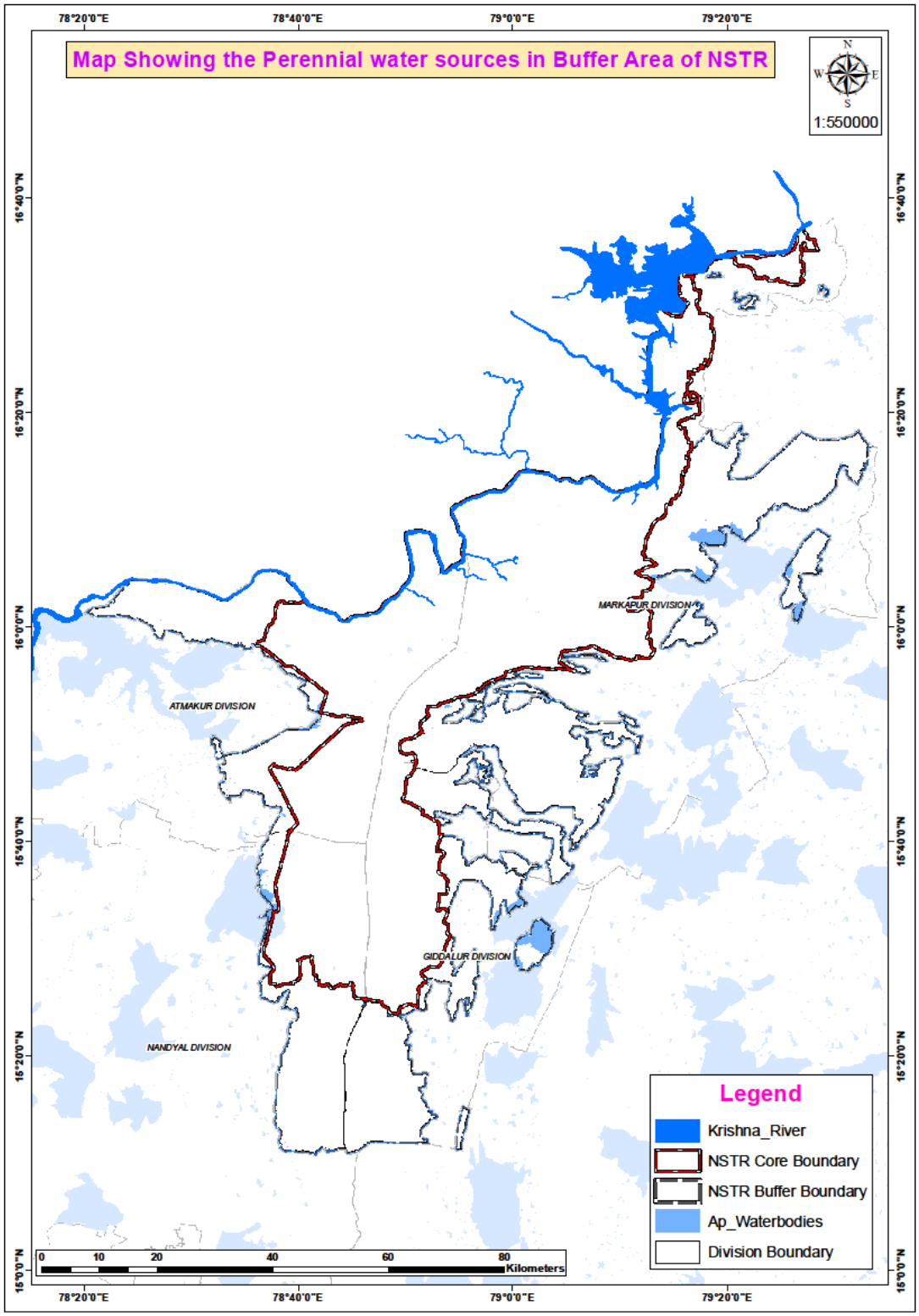








Map 14:– Map showing Perennial Water sources in Buffer Areas in NSTR



Solar water system:-

Solar pump based water system has already been established in the core area of Nagarjunasagar Srisailam Tiger Reserve in places like Pecheruvu, Ramiakunta, Isukagundem, GBM, Donga bavi, Damarlakunta and Naramamidi cheruvu. The water is utilized for filling the saucer through tankers, and excess water draining out to grassland and percolation tanks away from the tank, providing fodder and water to the wildlife. The water is also used by tribals and base camp watchers in the interior areas.

Table -9: Solar pumps in NSTR

Sl. No.	Division	Range	Beat	Location	Compt. No.	GPS Co-ordinates		Remarks
						Latitude	Longitude	
1	2	3	4	5	6	7	8	9
1	PT, Atmakur	Nagaluty	Indireswaram West	Chinnagummitham Base camp	834	15.93865	78.64965	Whole Year
2		Nagaluty	Venkatapuram	Padmarajuvagu	750	15.89697	78.66814	Whole Year
3		Velgode	Velgode West	Jadalaya rastha	651	15.79031	78.57320	Whole Year
4		Velgode	A.Kunta	Motta Base camp	692	15.68255	78.69953	Whole Year
5		Velgode	Pangidi	Subbareddy Coupe	666	15.73364	78.67336	Whole Year
6		Velgode	Pangidi	Zero point	642	15.71023	78.63503	Whole Year
7		Velgode	Pangidi	Thokala rastha	668	15.70466	78.68304	Whole Year
8		Velgode	Pangidi	Venkatadri Kunta	668	15.71260	78.66160	Whole Year
9		Srisailam	Pecheruvu West	Pedda Cheruvu water point	882	15.96082	78.83694	Whole Year
10		Srisailam	Pecheruvu East	Naramamidi Cheruvu	896	15.97752	78.88998	Whole Year
11		Srisailam	Pecheruvu West	Damarla Kunta	870	15.95704	78.81104	Whole Year
12		Srisailam	Sundipenta	Bilvavanam	908	16.05776	78.86760	Whole Year
13		Atmakur	Atmakur	Veerapuram Dongu	822	15.97607	78.56860	Whole Year
14		Bailruty	Kurutla Penta	Ramaiahkunta	742	15.87185	78.78073	Whole Year
15		Bailruty	Kurutla Penta	Chinnamorusu	745	15.86951	78.75418	Whole Year
16		Bailruty	Bairluty	Garigela Rastha	744	15.83928	78.68151	Whole Year
17		Bailruty	Pasurutla	Nakkadona	733	15.83018	78.74699	Whole Year
18		Bailruty	Pasurutla	Nandula veeranna	710	15.82185	78.66209	Whole Year
19		Bailruty	P.A.Puram south	Pullacheruvu Junction	709	15.82007	78.70744	Whole Year
20		Bailruty	Nallakalva	Gundal Kalva	694	15.82185	78.62436	Whole Year
21		Y.Palem	Kolukula	Thungudubavi	130	15.96948	79.15524	Whole Year
22		Y.Palem	T.R.Cheruvu	Nakerichetla Kunta	103	16.01343	79.05365	Whole Year
23	PT, Markapur	G.V.Palli	Burugundala	Rollunna Penta	366	16.161337	79136437	Whole Year
24		G.V.Palli	Palutla	Palanka Base Camp	367	16.166313	79.109503	Whole Year
25	PT, Markapur	G.V.Palli	Palutla	Palutla Base Camp	367	16.150557	79.045677	Whole Year
26		G.V.Palli	G.V.Palli	Bavipenta Location	141	16.046373	79.153972	Whole Year
27		G.V.Palli	Regumanupenta	Darabailu Base Camp	370	16.080094	79.051922	Whole Year

28		G.V.Palli	Burugundala	Peddamma Base Camp	366	16.09733	79.12468	Whole Year
29		G.V.Palli	G.V.Palli	Suddakunta	138	16.071388	79.213	Whole Year
30		Nekkanti	Nekkanti	Istakameswari gate	371	16.044179	78.940542	Whole Year
31		Nekkanti	Nekkanti	Istakameswari Base camp	371	16.084782	78.976897	Whole Year
32		Nekkanti	Nekkanti	Istakameswari temple	371	16.088822	78.974714	Whole Year
33		Nekkanti	Guttalachenu	Meethotabavi Base camp	364	16.19023	79.02974	Whole Year
34		Nekkanti	Chinnarutla	Peddarutla	97	16.0316	78.97114	Whole Year
35		Nekkanti	Chinnarutla	Chinnarutla	95	16.04275	78.95123	Whole Year
36	PT, Markapur	Dornala	Thummalabailu Beat	Yedurupadiya Base Camp	70	15.96611	78.92018	Whole Year
37		Dornala	Thummalabailu Beat	Pulicheruvu Location	93	15.9996	78.91806	Whole Year
38		Dornala	Thummalabailu Beat	Peddachama Gudem	76	15.937567	78.93378	Whole Year
39		Korraprolu	ChinnaManthanala	Chinna Manthanala Base camp	8	15.80404	78.84128	Whole Year
40		Korraprolu	ChinnaManthanala	Nadigadda	13	15.82553	78.84068	Whole Year
41		Korraprolu	Nallaguntla	Peddapenta	12	15.80392	78.84107	Whole Year
42	PT, Nandyal	Rudravaram	Utla	Chowsinga Base Camp	408	15.05931	78.72989	Whole Year
43		Chelama	Chelama	Regimaanukunta	529	15.44471	78.71385	Whole Year
44		Chelama	Basavapuram	Dhole base camp	514	15.46652	78.66852	Whole Year
45		Bandi Atmakur	N.R.Kunta North	Pullanna Kunta	605	15.681723	78.652603	Whole Year
46		G.B.M.	R.Penta West	Near GBM FRH	627	15.66018	78.64359	Whole Year
47		Nandyal	Palardam	Muduvagulagadda	569	15.48785	78.68677	Whole Year
48		Gundlakamma	Malakonapenta East	MLK Base camp	707	15.49101	78.82207	Whole Year
49		Gundlakamma	Malakonapenta East	Bandala revu	712	15.57293	78.82642	Whole Year
50		Gundlakamma	Isukagundam	ISK Base camp	713	15.59956	78.81337	Whole Year
51		Gundlakamma	Obulasunipenta	OBL Base camp	740	15.67159	78.80038	Whole Year
52		Gundlakamma	Isukagundam (West)	Uranaravafireline	729	15.64145	78.79831	Whole Year
53		Gundlakamma	Obulasunipenta	Near Obulasunipenta temple	740	15.66927	78.80074	Whole Year
54		Gundlakamma	Isukagundam(West)	Gaddivamulu	725	15.61918	78.78259	Whole Year
55		Gundlakamma	Malakonapenta West	Lokki	705	15.54536	78.82001	Whole Year
56		Gundlakamma	Diguvametta (North)	5th Mile	690	15.45554	78.81816	Whole Year
57		Gundlakamma	Malakondapenta East	Annadhamula Bolu	712	15.5734	78.81491	Whole Year
58		Gundlakamma	Isukagundam (West)	Obulasunipenta Junction	728	15.61441	78.79958	Whole Year
59		Gundlakamma	Ambavaram	Chikiranimanu pada	771	15.46804	78.88554	Whole Year

ABSTRACT

Sl. No.	Name of the Division	No. of solar bore wells
1	PT Atmakur	20
2	PT Markapur	21
3	PT Nandyal	06
4	PT Giddalur	12
	Total	**59**

The pump working on the solar energy needs only an assured water sources throughout the year of some minimum quantity. Such pumps should be encouraged in strategic places if assured water source is available.

7.2.2.3.3. Recommendations on Habitat Management in Buffer Zone:

1. Vaccinate the cattle in and adjoining areas of sanctuary at the onset of the monsoon.
2. Encourage cutting of dry coarse grass and discourage burning for the young and new flush shoots in reserve forests of buffer area.
3. Manage watershed in such a way that the plains and meadows shall get the seepage of water to keep the grass growing in all seasons and availability for drinking. Wherever the drinking water is not available, ensuring supply of water through tankers during dry period.
4. Create wallow pits for sambars and the wild boar for wallowing by blocking small rivulets in the plains and meadows.
5. Provide leaf litter profusely for the gallinaceous birds during the breeding season.
6. Open up the natural saltlicks to make readily available for the fawns and other young ones.

7.2.2.4. ZONAL PLAN IV: Regulations / Management of Linear Projects in Buffer:

Considering the fact that, NSTR is a very large reserve and it provides vibrant space for gene pool transfer in (2) sanctuaries i.e. Rajiv Gandhi Wildlife Sanctuary & Gundla Brahmeshwaram Wildlife Sanctuary. Moreover, NSTR is the source population for repopulating Seshachalam Biosphere Reserve and Sri Venkateswara National Park in Tirupathi. Therefore, securing connectivity between NSTR and adjoining protected areas is paramount for long term conservation of habitat.

Currently NSTR is acting as the torch bearer and source population for Sri Venkateswara National Park, Amrabad Tiger Reserve (Telangana State) and Palnadu Division. The buffer areas of NSTR acts as a good shock absorber for the core area and it is very much significant to keep the buffer area intact to reduce disturbance on the core area and also gene transfer to the corridor from NSTR. All future linear project in NSTR, their Mitigation Plans shall be approved by NTCA & NBWL.

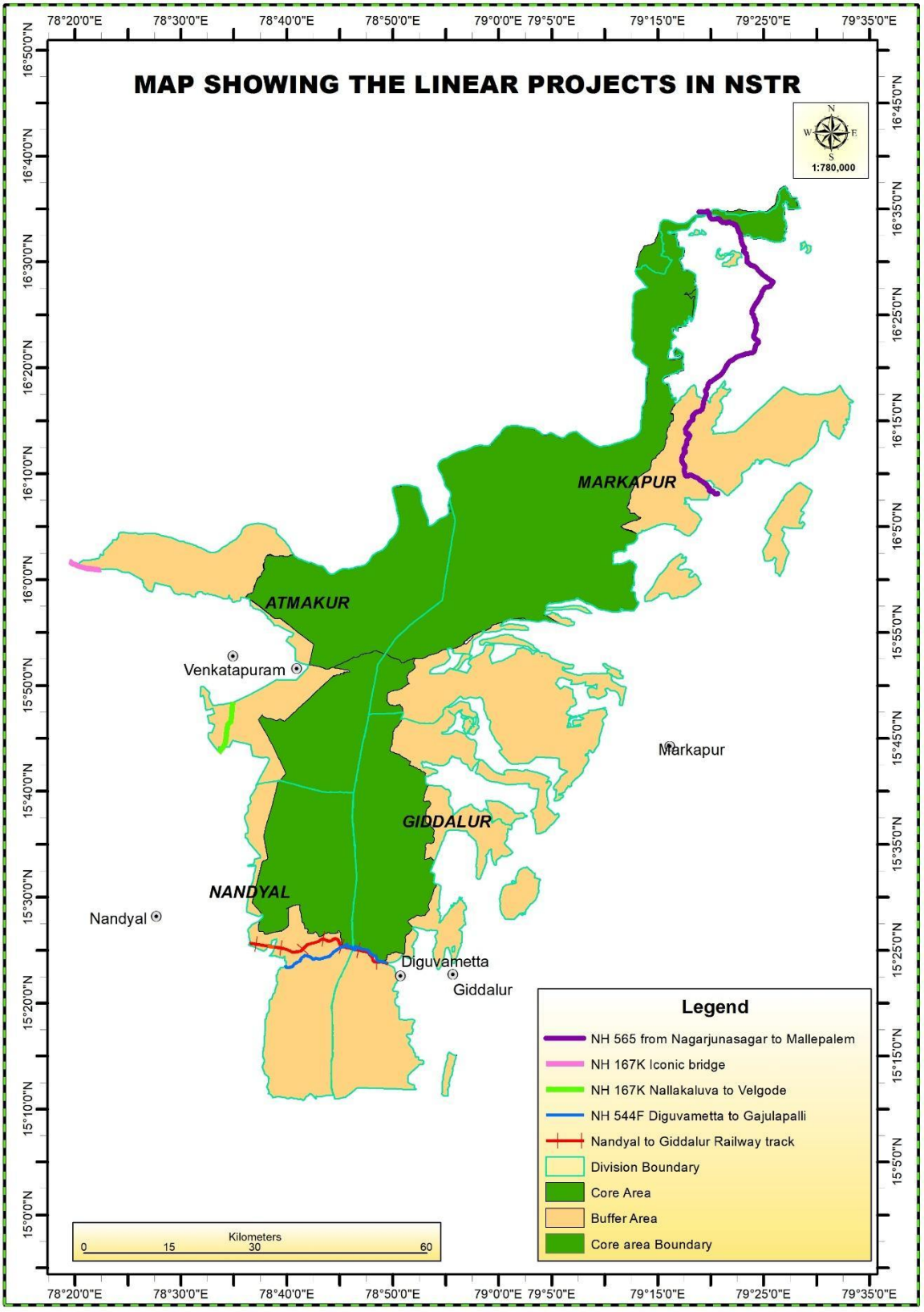
Night closure of the road in the key buffer areas may be considered to strengthen the protection of wildlife and avoid animal accidents based upon field data.

There are many linear projects (Railway tracks, National Highways etc.,) which needs proper evaluation and monitoring in terms of impact to animal movement and fragmentation of habitat. The major linear projects in the buffer areas are as follows:

Table -10: LIST OF LINEAR PROJECTS

Sl. No.	Name of the Division	Linear project details	Remarks
1	Project Tiger, Atmakur	NH 167 K Widening from Nallakaluva to Velgode: 2L+PS of Sangameswaram-Atmakur Section (km 79/300 to 87/360 and km 88/437 to 93/819) Iconic bridge across River Krishna and its approaches Atmakur Section (km 124+530 to 141+700) Nallakaluva to Velgodu Section.	Proposed
2	Project Tiger, Markapur	NH 565 from Nagarjunasagar to Davupalli and Davupalli to Mallepalem covering VP South, Y. Palem Ranges of PT Markapur and Macherla Range of Palnadu Division.	Forest and Wildlife clearance obtained and works are taken up by the User agency subject to the conditions stipulated
3	Project Tiger, Nandyal & Giddalur	Diversion of 32.25 Ha of forest land in PT Nandyal and PT Giddalur towards doubling of Railway line between Guntur to Guntakal Stations.	Forest and Wildlife clearance obtained and works are taken up by the User agency subject to the conditions stipulated
4	Project Tiger, Nandyal & Giddalur	NH 544/D & NH 544F Diguvametta to Gajulapalli covering 35 km is in Buffer of NSTR	Proposal is in initial stage.

Map 15:– Map showing Linear Projects in NSTR



I) NH 167 K Widening from Nallakaluva to Velgode:

2L+PS of Sangameswaram-Atmakur Section (km 79/300 to 87/360 and km 88/437 to 93/819) Iconic bridge across River Krishna and its approaches Atmakur Section (km 124+530 to 141+700) Nallakaluva to Velgodu Section.

Lot of Wildlife activity including frequent movement of tigers are seen on this road, many animals have died in the last 2-3 years {including one (1) Leopard many herbivore species (Sambar, Spotted deer), Snakes, Civet cat, many species of birds} due to negligent & reckless driving. National Highway (NHAI) authorities shall be strictly informed to put speed breaks and rumble strips with proper signages at every 500 meters all along where the road passes through the Tiger Reserve. Drivers should be strictly instructed to operate vehicles at 30 kms per hour (30 km/Hr) speed inside the Tiger Reserve area, proper signages shall also be installed by NSTR, Project Tiger officers and any violation shall be dealt strictly. NHAI shall carryout all the mitigation measures approved by National Board of Wildlife (NBWL) and any other Mitigation measures recommended/suggested by Field officers of NSTR during the course of execution of the project.

The detailed approved Mitigation Plan is enclosed as Annexure.

II) NH 565 from Nagarjunasagar to Davupalli and Davupalli to Mallepalem:

The Highway work has been initiated after obtaining due permission from the competent authority. The clearances under Forest Conservation Act, 1980 and Wildlife (Protection) Act, 1972 have been obtained. Lot of Wildlife activity including frequent movement of tigers are seen on this road, many animals have died in the last 2-3 years (Many herbivore species such as Sambar, Spotted deer, Snakes, Civet cat, many species of birds) due to negligent & reckless driving. National Highway (NHAI) authorities shall be strictly informed to put speed breaks and rumble strips with proper signages at every 500 meters all along where the road passes through the Tiger Reserve. Drivers should be strictly instructed to operate vehicles at 30 km/hr speed inside the Tiger Reserve area proper signages shall also be installed by NSTR, Project Tiger officers and any violation shall be dealt strictly. NHAI shall carryout all the mitigation measures approved by National Board of Wildlife (NBWL) and any other Mitigation measures recommended/suggested by Field officers of NSTR during the course of execution of the project.

The detailed approved Mitigation Plan is enclosed as Annexure.

III) Diversion of 32.25 Ha of forest land in PT Nandyal and PT Giddalur towards doubling of Railway line between Guntur to Guntakal Stations:

Lot of Wildlife activity including frequent movement of tigers are seen in this area on the Railway line, many animals have died in the last 2-3 years (including two (2) Tigers, two (2) Leopards, many herbivore species such as Sambar, Spotted deer) due to negligent & reckless operation of trains by Loco pilots. Loco pilots should be strictly instructed to operate trains at 30-40 km/Hr speed at all the time when the trains are moving inside the Tiger Reserve area. Railway Department shall carryout all the mitigation measures approved by National Board of Wildlife (NBWL) and any other Mitigation measures recommended/suggested by Field officers of NSTR during the course of execution of railway doubling works.

The detailed approved Mitigation Plan is enclosed as Annexure.

IV) NH 544/D & NH 544F Diguvametta to Gajulapalli covering 35 km is in Buffer of NSTR:

This project is in initial stage for four laning, if four laning is confirmed then mitigation plan shall be approved by NBWL in NTCA. This Highway connects Giddalur & Nandyal Divisions. Lot of Wildlife activity including frequent movement of tigers are seen on this road, many animals have died in the last 2-3 years (including one (1) Leopard many herbivore species such as Sambar, Spotted deer, Snakes, Civet cat, many species of birds) due to negligent & reckless driving. National Highway (NHAI) authorities shall be strictly informed to put speed breaks and rumble strips with proper signages at every 500 meters all along where the road passes through the Tiger Reserve. Drivers should be strictly instructed to operate vehicles at 30 kms per hour (30 km/Hr) speed inside the Tiger Reserve area proper signages shall also be installed by NSTR, Project Tiger officers and any violation shall be dealt strictly. NHAI shall carryout all the mitigation measures approved by National Board of Wildlife (NBWL) and any other Mitigation measures recommended/suggested by Field officers of NSTR during the course of execution of the project. It is essential to restrict the movement of vehicular traffic between Nandyal to Diguvametta Road (Kurnool-Guntur National Highway passing through Buffer area of Tiger Reserve) from 9.0 PM to 6.0 AM and regulate the traffic during non-prohibited hours in view of movement tiger and other wild animals in this road during night time.

However, securing this road for wildlife movement is crucial for supplementing corridor with wildlife population. Therefore, it is proposed that, the movement of traffic shall be restricted and regulated during evening hours between 9:00 PM to 6:00 AM after obtaining necessary permission from the competent authority.

DO's	***DONT's***
➢ 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 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

Penalty (fine) within Buffer of NSTR limits, for violation of Wildlife (Protection) Act, 1972 following due procedure. Penalties & fines shall be levied for violations decided by NSTR Field Director

7.2.2.5. ZONAL PLAN V: Religious Green Pilgrimage in NSTR:

Numerous places of worship/pilgrim places such as Ahobilam Temple, Omkaram Temple in the Buffer area of Nagarjunasagar Srisailam Tiger Reserve (NSTR), holding significance for local communities. Huge influx of Pilgrims in Buffer area of Tiger Reserve during Shivarari and Ugadi Festivals is experienced. It is estimated that, two to three (2-3) lakh pilgrims visit during Shivaratri and Ugadi Festivals in the Buffer area of Tiger Reserve during February, March and April months every year. There are some temples in Buffer area such as Ahobilam Temple and Pavan Narasimha swamy Temple where the Pilgrims visit the temple through out the year. This is perhaps causing irreparable and lasting impact on the Wildlife habitat and biodiversity in Buffer area of NSTR. Pilgrims throw large

quantity of plastic waste, garbage, solid waste etc., in the Tiger Reserve. 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. While the National Tiger Conservation Authority (NTCA) acknowledges the need to manage religious tourism.

7.2.2.5.1 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 *E coli* 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.

7.2.2.5.2. The Green Pilgrimage Model:

1. As an initiative to reduce the impact of pilgrimage, it is proposed to introduce Green Cess (GC)/Environmental maintenance charges (EMC) in Buffer area of Tiger Reserve. The EMC charges collected would go towards restoring the natural habitat in order to maintain its ecological value. Initiatives like waste/plastic cleanup through employing local tribals as swatch sevaks, fire watchers, protection watchers and other such steps to restore the habitat.
2. Research the dynamics of religious tourism in tiger reserve and impacts and threats to biodiversity.
3. Make recommendations for improved management of the Tiger Reserve before, during, and after pilgrimages.
4. Support the establishment of multi-stakeholder committees to develop and launch co-management plans for a more conservation friendly pilgrimage.
5. Launch awareness campaigns before and during pilgrimages that includes faith based conservation messages.

7.2.2.5.3 Conclusion:

The “Green Pilgrimage” Model has great potential for application to Buffer area of 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 is essential to establish 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 Buffer area of Tiger Reserve.

7.2.2.6. ZONAL PLAN VI: Other management measures:

After careful scrutiny of wildlife needs and the welfare factors available in the buffer zone habitat, the following management actions are recommended. Bamboo coupes and other plantations shall be managed in accordance with the working plan and with the permission of the PCCF (WL), in harmony with the supplementary guidelines of the NTCA.

i) Protection:

- In order to prevent the poaching, outstation patrol camps should be created in the vulnerable areas of the Tiger Reserve to keep a constant vigil.
- The entry of vehicles should be closely checked.

ii) Biotic Interference:

- Most of the area in the buffer zone is exposed to biotic pressures in the proximity of village settlements, places of availability of forest produce, cattle grazing, lopping and human movement on foot, vehicles or fishing boats. These need to be regulated.

iii) Improvement of existing Water Sources:

Water is an important constraint especially during the summer months, and becomes a limiting factor during the "**pinch period"**.

***iv) Improvement of Food and Cover:* Pasture development:**

- It should be ensured that the area is kept to a suboptimal level, ensuring dispersal but not residency of wildlife.
- As it has been mentioned in earlier chapters, there are several small grasslands occurring in the buffer zone.
- These grasslands are more or less adequate for the wild herbivores.
- Once the eradication of woody stumps has been done, further maintenance of grasslands shall have to be done by fire management.

v) Burning regime, seeding and grass cutting in reserve forest of buffer area:-

- During the collection of Mahua (Ippa), Tuniki and other NTFP by tribals and locals, the ground is burnt to facilitate the collection.
- These fires may not cause much damage to the trees, but they burn down all the dry and semidry fodder available in the habitat.
- Further, frequent or total removal of fruits like Amla, Kunkudu, Myrobylon etc., by NWFP collectors will degrade the habitat.

- Therefore, collection of NWFP should be regulated keeping in view the interest of wildlife.
- Early "Cool Burns" are suggested.

vi) Improvement of cover:

- Escape, ambush, reproductive cover is much available and no special works are to be taken up except protecting from the fire.

vii) Necessity of silvi-cultural practice in reserve forest part of buffer area:-

- Non-working of bamboo is creating congestion and wild animals avoiding using the habitat especially the stags with antlers.
- Practicing desirable silviculture activities would improve the habitat conditions and avoid unhealthy commercial exploitations of gum, resins, bark etc.
- Scientific and well planned clearing of bamboo shall open up the space for regeneration of palatable grasses and tree species and avoid bamboo monoculture trauma for the landscape.

viii) Control of weeds:

- 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.
- The uprooting has to be done during rainy season by using crowbars and pulling the plants upside down by ropes.

ix) Grassland Management:

It should be ensured that the area is kept to a suboptimal level, ensuring dispersal but not residency of wildlife.

- Woodland savannahs / Grasslands in NSTR buffer constitute the most important part of the habitat mosaic, sustaining the prey populations and, in turn, the predators and co-predators.
- The excessive biotic pressure and frequent occurrences of fire contributed to the present deterioration of heterogeneity of 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 buffer zone. The following prescriptions for grassland management are given:

- The presence of annual grass species such as *Themeda, Eragrostis* and *Dimeria ornithopoda*, in undisturbed grasslands, indicates that still some areas are free from the biotic disturbances.
- On the other hand, *Heteropogon contortus*, which was earlier less dominant species in some areas, now has attained dominant status.
- Other species like *Dichanthium annulatum* and *Themeda quadrivalvis, Bothriochloa odorata, Cynodon dactylon, Imperata cylindrica* and some species of *Eragrostis* have also been recorded in almost all the grasslands.
- Considering the succession tendency of the grasslands and their gradual degradation due to severe grazing pressure, the NSTR Management should erect enclosures to prevent the invading unpalatable species by domestic cattle and fire.

x) Prescriptions for Bamboo:

- Bamboo coupes in reserve forests are part of the buffer area to be worked as per silvicultural prescriptions.
- Bamboo (*Dendrocalamus strictus*) is an important cover type in this tiger habitat, and is a common understory. During the early stages, or the new shoot formation stage, it has tremendous food value for 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 hamper the growth of other forage as well as browsable 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.

xi) Water Development:

The amount, availability, quality and presence throughout the year of water can be improved for the benefit of wild and domestic livestock through certain ameliorative measures at all water sources. The blanks and sparse scrub areas to be tackled for afforestation after a thorough ground truthing as the blanks may consist of barren rocky out crops, which are not suitable of any kind of planting operations. Care should be taken that the grass meadows should not be brought under the afforestation programme.

CHAPTER – 8

Research, Monitoring, Training and Wildlife Health



8.1. RESEARCH PRIORITIES:

The main research priorities in the Buffer area are listed below:

- Determining the visitor carrying capacity in all the religious establishments and Eco-tourism Zones.
- Determining the Prey density.
- Determining the optimum carrying capacity of Predators with the given prey density, keeping in view dispersal.
- Survey and determine the number of cattle present in the Tiger Reserve in different seasons.
- Socio-ecological impact assessment of proposed Eco-tourism sites.
- Determination of human wildlife conflict and its mitigation measures.

8.2. RESEARCH PROJECTS

Proposed Research Projects are as follows:

Sl. No	Name of the Research Activity	Justification
1	Study on impact of Forest Fires in Buffer of NSTR	Forest fires, year on year kept increasing and the regeneration is being adversely affected.
2	Study and documentation of Avian Fauna and Bio – Diversity of NSTR	Documentation on Avian Biodiversity in Buffer of NSTR will help in further research.
3	Study on Linear Intrusions	Study on major linear intrusions and their impact on animal movement
4	Study on temple tourism and human pressures	Study on the various temples and other anthropogenic pressures.

Expertise in various scientific aspects of research and monitoring will be sought from different government agencies such as the Zoological Survey of India, Botanical Survey of India, Wildlife Institute of India, BNHS, NEERI, the Fisheries Department, independent researchers, and universities. Universities of Andhra Pradesh—namely Yogi Vemana, Nagarjuna, Sri Venkateswara, and Andhra University—as well as the Indian Institute of Science Education and Research (IISER), Tirupati, may be involved in the research activities of NSTR. Research scholars should also be required to submit reports of their findings so that the results can be incorporated into the management of the Tiger Reserve..

8.3. Monitoring Framework:

A monitoring and evaluation framework is to be developed in consultation with experts in administration for the following important activities:

1. Fire management,
2. Habitat management,
3. Monitoring of prey and predator (e.g. M-STrIPES)
4. Wildlife health monitoring
5. Management of tourism
6. Protection
7. Publicity and awareness

Based on data collected through the above exercises, a database on distribution of tigers, co-predators and prey base, potential habitats and threats to the population and habitats will be created by ACF, Biodiversity. Reports on the monitoring programme will be submitted to Field Director and Chief Wildlife Warden for onward submission to NTCA.

8.4. Training Needs Assessment:

Broad topics for training are listed below.

Eco-development:

1. Evolution of Eco-development Plans and inclusion of best practices of Eco-development sites from all over the country.
2. Best practices of eco-development initiatives and conflict resolution in eco-development.
3. Development of micro enterprises involving local forest fringe communities.
4. Socio-ecological linkages and their sustainability
5. Role of NGOs in eco-development (case studies)
6. Methods of resource inventory and need assessment with the help of local communities.
7. Leadership and eco-development-empowerment of women
8. Accounting and financial management in EDCs – Training and capacity building.

Eco-tourism:

1. Impact of CBET programmes on surrounding areas and waste management.
2. Tourism – following all the safety protocols for the visitors
3. Communication and interpretation skills for local and tribal communities.
4. House keeping
5. Accounting and financial management in CBET programmes
6. Principles of conservation education

8.5. HRD Plan:

- Regular training of local staff for skill up gradation. The assistance of training institutes as well as NGO's can be availed.

- Regular incentives to be given to the staff to inculcate a sense of pride in duties and promote healthy competition.
- Exchange programmes with other tiger reserves to inculcate best practices in the management of the park.
- Periodical review of performance of employees both regular and outsourcing.
- Establishing a grievance redressal mechanism for all employees as well as for visitors to the tiger reserve.

8.6 Wildlife Health Monitoring

As per Section 33 (A) of Wildlife (Protection) Act, 1972 the livestock kept in or within 5 km of Sanctuary are required to be immunized and hence, the cattle shall be vaccinated regularly with the help of District Animal Husbandry Officer. This is to ensure to keep the wildlife free from contagious diseases which can spread from domestic animals.

8.7 Treatment Transit Centre (TTC):

Treatment Transit Centre (TTC) shall be established in Project Tiger, Atmakur (Bairluty) and Project Tiger, Markapur (Dornal) to provide immediate treatment to injured/rescued wildlife. All the treated wild animals may be released back into the wild after the completion of the treatment protocol. Given the frequency of road accidents and rescues in the past few years, it is essential to have multiple Transit treatment Centres at strategic locations to ensure timely treatment of wildlife. This is primarily a temporary facility for providing immediate relief to wildlife that are in distress or injured.

CHAPTER – 9

Tiger Population and Habitat Assessment



9.1. DAILY MONITORING PROTOCOL:

Tiger conservation managers require accurate and timely information on the presence and their populations, but this is often difficult for cryptic species living at low densities over large areas. Therefore 60 'Tribal Tiger Trackers' (TTT) and protection watchers are engaged to daily monitor and track the tigers in Buffer area apart from core area.

Tiger occurrence is mapped within a geographical information system (GIS) using repeat detection–non-detection surveys to incorporate a function of detection probability into a logistic regression model.

Animal Trackers/ Tiger Trackers :

- Animal Trackers / Tiger Trackers should be trained for M-STrIPES.
- They are engaged to move in the forests on foot, perambulating the areas where the wildlife is usually seen moving.
- They record the presence of signs like pug marks, scats etc., and also report direct sightings, if any.

- They also scan areas prone for poaching wild animals like water holes and remove snares, traps etc., if any.
- They keep a watch on the movements of any poachers or smugglers etc., and take immediate action, if anyone is sighted.
- Usually the local youth like Chenchus who know the terrain well and who can walk for long distances are employed for this. Their regular patrolling duty inside the buffer is of immense help in protecting the forests and wildlife.
- They are also trained to monitor the camera traps which are located in the area of their operation.
- The deployment of local tribal youth in Base camps, Strike forces and Animal trackers / Tiger trackers is a "win win" situation for them as well as for the forests and wildlife. They get employment and regular source of income which weans them away from anti-social elements, smugglers and poachers.
- Their presence and movement is a deterrent to smugglers and poachers and improves the protection of forests and wildlife in that area.

9.1.1. Duties of the Tiger Trackers and Protection watchers:

Each of the monitoring segments will be manned by four tiger trackers and they shall perform the following duties concentrating more on the Tiger.

1. Daily monitoring of the tigers in their segments with GPS instruments.
2. Preparation of Pug Impression Pads (PIPs) along the tiger trail.
3. Collection of the indirect evidences of the carnivores.
4. Collection of prey base information through pellets with GPS readings.
5. Assist the Research Assistants for conducting research on tiger monitoring.
6. Protection of the tiger habitat from fires, grazing, indiscriminate collection of NWFP, removal of non degradable litters.
7. Cleaning saucer pits.
8. Assist the staff in prevention of poaching and tree felling.

The range staff will collect the information from the tiger trackers and send soft / hard copies to the Conservator of Forests & Field Director and the Biodiversity Research Centre while submitting to the respective Divisional Forest Officers every day. The beat wise and range wise tiger monitoring maps are prepared and analyzed.

9.2. TIGER POPULATION ESTIMATION AND MONITORING FRAMEWORK (PHASE I,II, III & IV)

Tiger – the iconic species – is a symbol of our forests and biodiversity. The status of the tiger reflects not only the health of its habitat and prey species, but also the effectiveness of our conservation efforts.
Until recently, this tiger reserve, like many others across the country, had adopted the traditional pugmark count method, originally developed by Sarojraj Choudhury and later refined by L.A.K. Singh, for estimating tiger and leopard populations. However, it is now widely recognized that such census-based approaches have several biological and statistical limitations.Over the past 35 years, our understanding of tiger ecology has advanced significantly, thanks to numerous scientific studies. The concepts and methods used for assessing wildlife populations have also seen considerable progress within the scientific community.

There are two important methods to know the population status of carnivores and wild ungulates estimation. They are 1. Distance Sampling and 2. Capture – Recapture methods. Due to the recent controversies over the traditional exclusive pugmark census, the annual estimation of tigers and prey is done using the new methodology, as developed by the Wildlife Institute of India and the Directorate Project Tiger, New Delhi, Government of India as communicated vide its reference F.No. 7-2/2002-PT (Part-I), Dt: 07.03.2006.

This new method is being followed from the year 2006 onwards in N.S.T.R including in buffer area. Salient broad headings of new method are given hereunder -

A) Sampling for Tiger, Leopard, and Other Carnivore Sign Encounter Rate

To obtain data on the presence, absence and intensity use of a beat by tigers and other carnivores, we shall quantify the relative abundance of tiger, leopard, and other carnivore signs in an area.

B) Sampling for Ungulate Encounter Rates

This protocol outlines a simple method for quantifying ungulate abundance in an area based on visual encounters while walking along fixed line transects.

C) Sampling for Vegetation, Human Disturbance, and Ungulate Pellets

To quantify the habitat parameters and determine relative abundance of ungulates vegetation sampling will be done along the same line transect on which ungulate encounter rates were estimated. This will be done in the core area and in buffer areas.

D) Sampling for Ungulate Pellets

Ungulate abundance will also be indexed by enumerating their faecal pellets. This exercise shall be done on the same line transect that has been sampled for ungulate encounter rate.

The transect survey for animal abundance, carnivores evidence collection on trails paths in Buffer area will be carried out in a periodicity of 6 months i.e November and May every year. Mostly the transects and the trails laid during 2006 and 2010 national level tiger assessment with latitude and longitude. This data will be collected using M-STrIPES.

9.3. HABITAT ASSESSMENT FRAMEWORK:

The estimation taken up for monitoring wildlife will include the protocol followed by All India Tiger, Co- Predator, Prey and Habitat evaluating data sheets and it will be done along with the methodology as mentioned in the above paragraph.

9.4. SPATIAL DATABASE DEVELOPMENT:

- Robust 'Spatial' data that are likely to influence tiger occupancy of Nallamalai landscape area developed on 1:250K and 1:50K scales (with the help of our APFD Geomatics Center). Satellite remote sensing data (IRS LISS III, PAN, WiFS and AWiFS data), Topo-maps, Management maps, Reference maps and other ancillary information are used for this purpose.
- Further the daily monitoring evidences on Tigers and other wildlife will be continuously mapped in GIS domain.
- M-STrIPES is implemented in the 18 ranges of the core area. The staffs have been provided with GPS and PDAs to record geographic locations and other attributes. This system generates spatial data at desirable interval for knowing the trend of wildlife; population dynamics, habitat parameters and threats like fire and poaching etc, and thus help park managers to take appropriate periodic decisions. The staffs are getting trained and will be extended to buffer areas also.
- The attribute data is collected on livestock abundance, human density, socio-economic parameters, rainfall, groundwater, water quality etc.
- The wildlife census data is used to derive the distribution maps of herbivores, carnivores and the habitat conditions (forage, water sources, and other parameters).

- The field inventory is systematically conducted, and the data is used to derive the volume and biomass maps.
- The data is used in deriving
  1. Vegetation change detection maps
  2. Herbivore density estimation
  3. Tiger density estimation
  4. Predator-prey base relationships
  5. Site suitability maps for the construction of Water Harvesting Structures (WHS) and the erosion response model
  6. Forest fire risk zonation maps
  7. Suitable habitats for the relocation of Blackbuck
  8. Suitable sites for eco-tourism,
  9. Wildlife habitat mapping and corridor analysis, landscape characterization etc.

9.5. ANALYSIS AND REPORTING FRAMEWORK:

- **Estimating the population of tigers:**

The data from the field will be sent to the biodiversity research center to analyze the indirect signs and their relative abundance and stratify them as high, medium, low and absence at the beat, range and division levels in core and buffer areas of NSTR. Other techniques like capture-recapture based on camera traps, pugmarks, and DNA profiles obtained from tiger scats to assess the tiger population.

- **Tiger prey – the line transect data is used to derive and monitor trends in ungulate** population and site-specific occupancies. Encounter rates of ungulates and pellet group counts are used to derive herbivore density and their distribution through modeling.

  - The transect line survey and the animal trails in buffer areas will be carried out in a periodicity of 6 months during November & May every year. Transects and trails laid during 2006 & 2010 with lat & long will be used. This data will be collected using M-STrIPES.
  - Monthly report in appropriate format will be furnished to Chief Wildlife Warden and NTCA.

CHAPTER 10

Protection and Intelligence Gathering



The buffer area needs to be protected from illegal felling of trees, destruction of forests for encroachment, poaching, fire, grazing etc. The different strategies proposed for protection of wildlife and its habitat are prescribed below.

10.1. Development of native workforce

In the Nagarjunasagar Srisailam Tiger Reserve (NSTR) a large number of local people especially members of the local Chenchu tribe are employed. They are employed on outsourcing basis in various capacities by the Forest Department to help with the day to day administration of the Tiger Reserve. In addition, many of the local people have joined as regular staff of the Forest Department. The outsourcing jobs can be broadly divided in to the following categories.

The details of deployment of the native workforce in buffer area of Nagarjunasagar Srisailam Tiger Reserve is proposed as follows:

Sl. No	Division	Base camps		Strike forces / WPRPS		Check posts		River parties		Dog squad
		Nos.	No.of PWs	Nos.	No.of PWs	Nos.	No.of PWs	Nos.	No.of PWs	
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**		**10**
1	Atmakur	14	70	5	25	3	23	2	10	1
2	Markapur	4	20	6	30	5	35	2	8	1
3	Giddalur	3	15	2	10	1	6	0	0	0
4	Nandyal	7	35	2	10	1	3	0	0	1
	Total	**28**	**140**	**15**	**75**	**10**	**67**	**4**	**18**	**3**

i) Striking Forces / Wildlife Protection and Rescue Party:-

There are 15 no. of Striking Force / Wildlife Protection and Rescue Parties in the Tiger Reserve currently. Each Striking Force consists of (5) members called Protection Watchers employed on outsourcing basis and their job is to assist the regular staff for protection activities. They are allotted a jurisdiction and provided with a vehicle for patrolling in that jurisdiction.

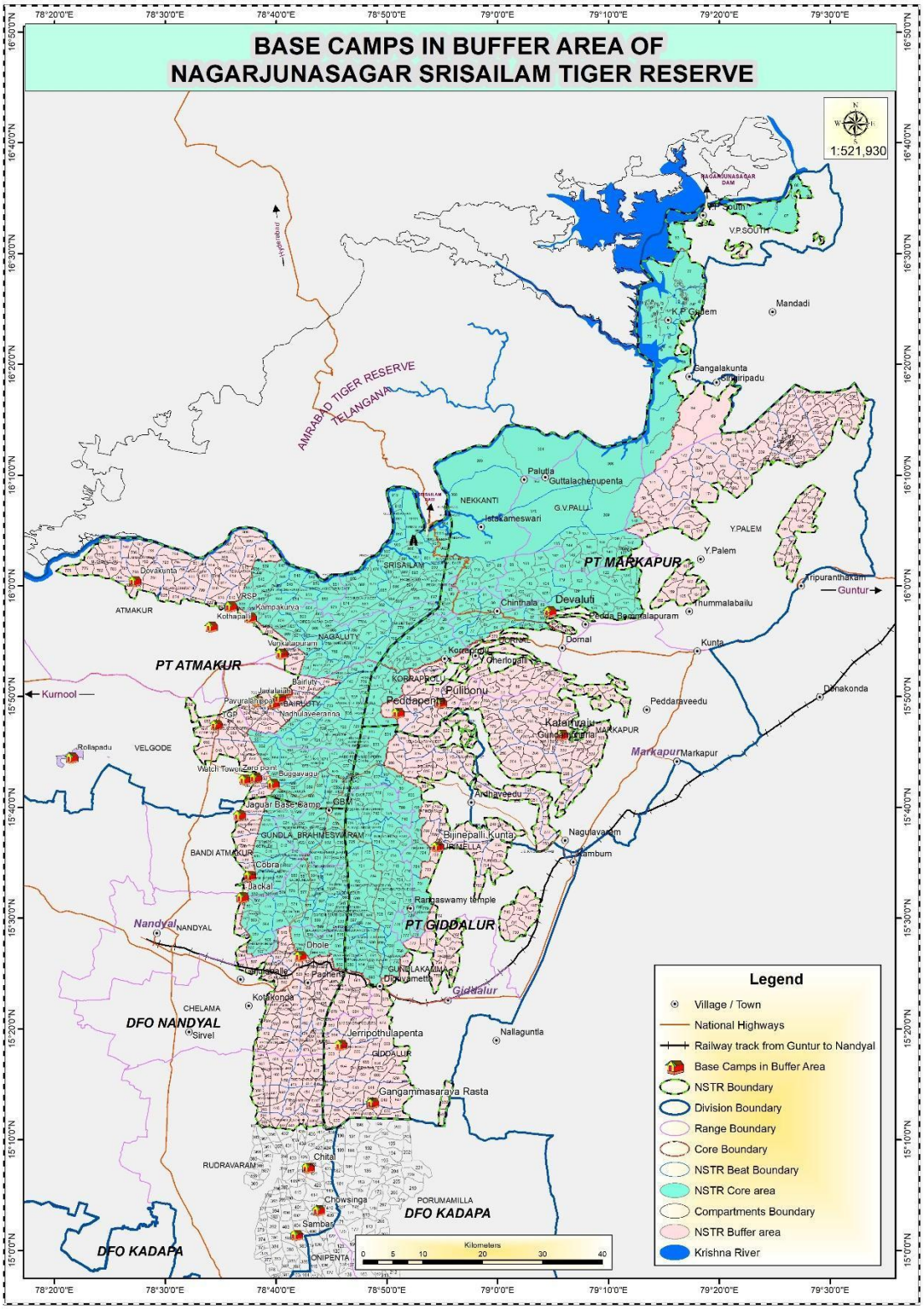
ii) Check posts:-

There are 10 nos. of Check Posts in the Tiger Reserve currently. Each check posts helps to regulate the traffic into and out of the Tiger Reserve as well as keep a check on illegal transportation of forest produce / wildlife etc.

iii) Base camps / Anti Poaching Camps:-

There are 28 no. of Base Camps / Anti Poaching Camps in the Tiger Reserve currently. Each base camp consists of (5) members called Protection Watchers employed on outsourcing basis and their job is to assist the regular staff for protection activities. Each camp is located in a vulnerable area and most camps have a semi permanent structure where all essential amenities are provided. The number of base camps is limited by the availability of funds from ongoing schemes. As the availability of funds increases the number of base camps should also be increased to ensure maximum protection.

MAP 16: Base Camps in Buffer Area



iv) River Party:

There are 4 no. of River parties in the Tiger Reserve currently. The River Parties are responsible for patrolling the interstate boundary along the River Krishna. They help to keep a check on illegal activities such as poaching, illegal fishing, illegal transportation of forest produce etc., Each River Party consists of (5) members called Protection Watchers employed on outsourcing basis and their job is to assist the regular staff for protection activities. They are allotted a jurisdiction and provided with a Boat and safety equipment for river patrolling in that jurisdiction.

v) Dog Squads:-

There are 3 no. of Dog Squad parties in the Tiger Reserve currently. Each Dog Squad consists of (1) trained Dog along with two handlers. They are provided with a separate vehicle and help in patrolling and detection of wildlife crime in the Tiger Reserve.

10.2. Patrolling Strategy including Joint Patrolling:

Monitoring System for Tigers-Intensive Protection & Ecological Status (MSTrIPES):-

M-STrIPES is a software-based monitoring system launched across Indian tiger reserves by the National Tiger Conservation Authority. M-STrIPES mobile app was developed by the Wildlife Institute of India (WII) in collaboration with the National Tiger Conservation Authority (NTCA). The application of the M-STrIPES mobile app by the field staff was started from 2019-20 in NSTR.

Forest Beat Officers of NSTR are equipped with an Android-based M-STrIPES Mobile App to capture the Mortalities, Water Sources, Sightings, and Human Impacts while patrolling. The software system will map the patrol routes covered by Field staff/Protection watchers, and the resulting data will be analysed in the M-STrIPES desktop version by the concerned Range Officers/Sub-Divisional Forest Officers/Divisional Forest Officers/Conservator of Forests. This is intended to enhance the effectiveness and spatial coverage of patrols.

River patrolling including Interstate River patrolling:

NSTR shares a long interstate boundary with Amrabad Tiger Reserve of Telangana State along the River Krishna for a distance of more than 200 Kms. In the past it was noticed that, this River was used to transport illegal forest produce and carry out illegal fishing. This river is also used as a crossing point for grazers to enter into the Tiger Reserve. To control all these activities (3) three river parties in two divisions namely Project Tiger, Atmakur and Markapur were setup. Each river party is provided with a boat, safety equipment and consists of (5) protection watchers along with regular staff. From time to time joint patrolling with Telangana State forest officials is also taken up.

10.3. Maintenance of Village level crime Dossiers

In all Forest Range Offices, a detailed list of wildlife offenders in the Range are maintained. Whenever EDCs have been constituted, a village level crime register should be maintained at the EDC level to keep track of villagers involved in wildlife offences. Constituting a Defence Squad comprising of local, proactive villagers at the EDC level, which can assist the PA staff in apprehending miscreants involved in wildlife poaching.

10.4. Fire Protection

NSTR mainly consists of Tropical Dry Deciduous Forests with very few patches of Moist Deciduous Forests. In the dry season which lasts from November – December to the start of the monsoon in June the forests become very dry and are prone to fire. Protection of the forest from fire is one of the main management activities.

The following management practices to mitigate damage by fire are undertaken in NSTR.

i) Fire Lines:

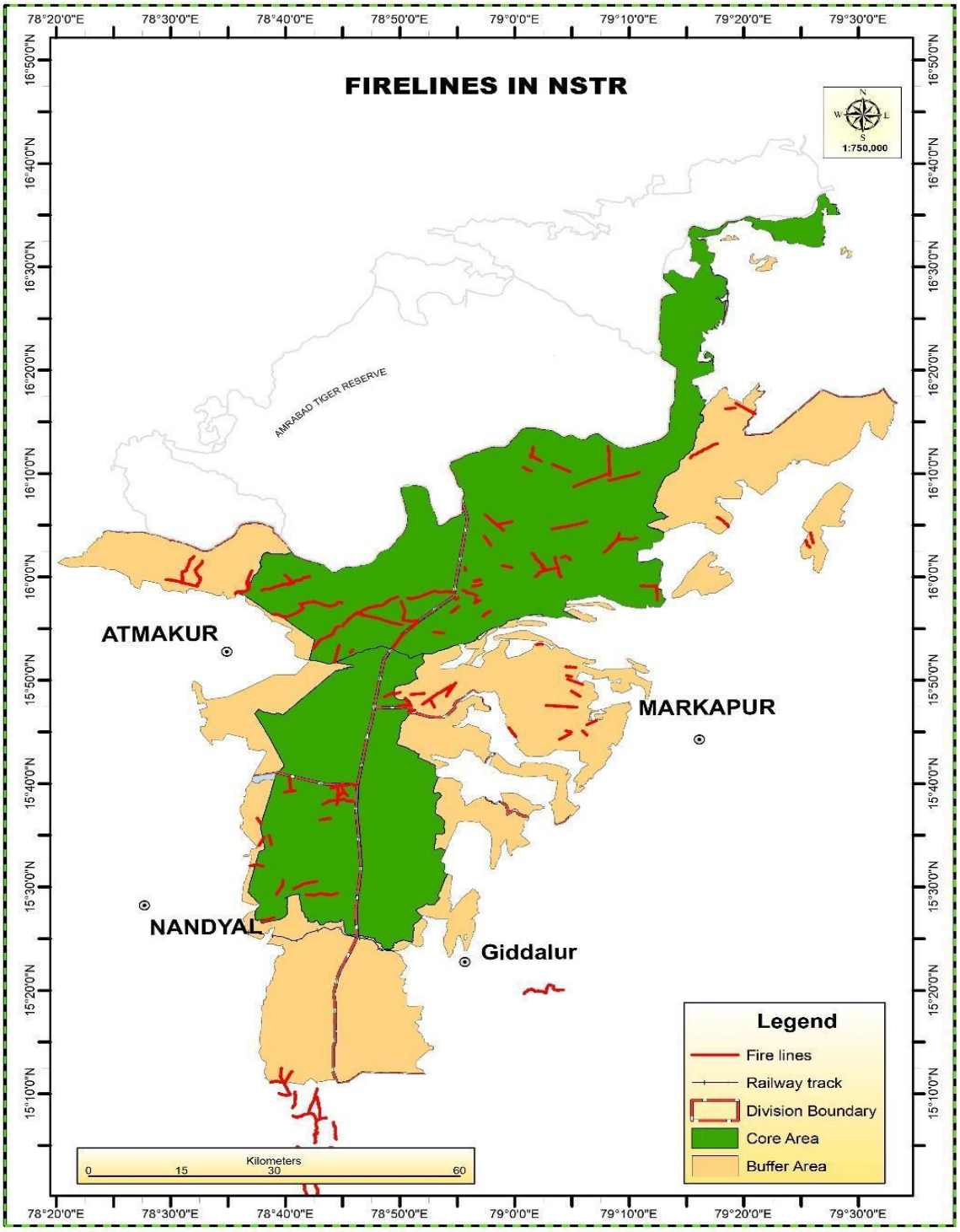
Every year, after the monsoon season old Fire Lines are maintained and new ones are created where there is a need as per the field requirement and budget availability. Some Fire Lines have been maintained since before Independence such as Sim's Fire line and Wood's Fire line.

ii) Fire Watchers:

Fire watchers from the local communities especially Chenchu tribals are engaged as Fire watchers for the months of January to May every year. The number of Fire Watchers is determined by availability of budget and vulnerability of the area concerned. The duties of

the fire watchers are to patrol the forest areas during the fire season and douse any fires they encounter. In case of larger fires, they inform the staff. The Fire Watchers are provided with protective safety equipment such as Gloves, Goggles, Shoes, Fire suit, Water bottles etc. Equipment to douse fires such as Fire beaters, Leaf blowers etc are also provided wherever required. All other staff (Regular as well as outsourcing) assist in putting of fires during the fire season.

Map-17: Map showing Fire lines in NSTR



iii) View Lines:

Every year, after the monsoon season, view lines are maintained where there is a need as per the field requirement and budget availability. View lines are created along the Roads crossing the Tiger Reserve, Jungle safari tracks, patrolling paths, pilgrimage routes etc. These view lines act as Fire breaks besides helping protecting wildlife while they are crossing the roads.

iv) Fire alerts:

All the regular staff of the Tiger Reserve have been registered with the Forest Survey of India to receive the fire alerts. The boundary of the entire Tiger Reserve has been digitized and submitted to Forest Survey of India. The Forest Survey of India obtains information of satellite data regarding fires and compares it to the digitized forest boundaries. All fires inside forest boundaries are identified and once the location is confirmed , a SMS message is sent directly to the concerned staff. Fire alerts are monitored daily at the Deputy Directors office, Field Directors office and the O/o the Prl. Chief Conservator of Forests, A.P.

10.5. Intelligence Gathering and Coordination

Flying Squad Division, Atmakur:-

NSTR has a Flying Squad Division which is headed by Divisional Forest Officer headquarters at Atmakur. This division has jurisdiction over Atmakur, Markapur, Nandyal and Giddalur Divisions of Project Tiger Circle, Nandyal.

Sanctioned strength of staff – Flying Squad Division, Atmakur

Sl. no.	Name of the Post	Sanctioned strength
1.	Divisional Forest Officer	1
2.	Forest Range Officer	1
3.	Forest Section Officers	2
4.	Forest Beat Officers	3
5.	Assistant Beat Officers	2
6.	Junior Assistant	1
7.	Driver	1
8.	Office Subordinate	1

The main duty of the Flying Squad Division is to detect, curb and control illegal activities in the Tiger Reserve. They also help in monitoring the Wildlife movement, inspect vulnerable routes and areas and bring to light irregularities, if any to the notice of the competent authorities and act as a vigilance cell of the Forest Department.

CHAPTER 11

Ecotourism, Interpretation and Nature Education



11.1. Tiger Conservation Foundation and Management of Community Based Ecotourism Programmes:-

In pursuance of Sec. 38 X of Wildlife (Protection) Act, 1972 (53 of 1972), the 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 guidelines, the Govt. of Andhra Pradesh registered the society under the Societies Registration Act, XXXV of 2001 on 26th day of August 2008.

Nagarjunasagar Srisailam Tiger Reserve comprises of (4) Four Divisions namely Project Tiger, Atmakur, Markapur, Giddaluru and Nandyal. All the four divisions are under the unified control of 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, the environmental degradation and pollution which accompanies 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.

11.2. Community Based Eco-Tourism (CBET) programs

All Eco-tourism activities in the Nagarjunasagar Srisailam Tiger Reserve are to be taken up after consultation with and by involving the local communities. Community Based Eco tourism activities will be implemented by Eco Development Committees constituted as per guidelines issued in G.O.Ms.No 13, EFS&T (FOR-III) Department, dated. 12-02-2002. The financial support to the Eco Development Committee will be channelised with a manner prescribed for financial management of Eco Development Committee. The Eco Development Committees will receive financial support, keep books of account, render services and manage facilities for Community Based Eco tourism.

11.3. Ecotourism Guidelines and Constitution of Park Welfare Funds:

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 – All sites should be identified through a participatory process involving all stakeholders particularly the local communities. All Eco-tourism activities are to be community based eco-tourism where the local stakeholders are 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, Andhra Pradesh Tiger Conservation Foundation (APTCF) etc.,

- All Eco-development Committees 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 in 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 to Eco-tourism sites.
- 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 be undertaken by Tiger Reserve Managers to ensure that the eco-tourism facility is safe, clean, hygienic and well run.

Considering the vastness of the area and the dependence of fringe villages on the Tiger Reserve, there is an imminent need to promote ecotourism at strategic locations, particularly in the buffer areas. This will help reduce stress on forests and wildlife by providing and enhancing alternative livelihood opportunities for local communities. The proposed tourism activities are planned to be sustainable and to cause minimal disturbance to wildlife by adhering to the carrying capacity of the designated tourism sites and zones.

1) Objectives of Eco-tourism:

- To promote low impact nature tourism which ensures ecological integrity of the ecosystem and ecotourism sites.
- To promote biodiversity, traditional ecological knowledge and heritage values of India's wilderness.
- To promote engagement of local communities in nature tourism in a manner that enrich local economy and encourages sustainable use of indigenous material through financially viable value chains.
- To promote partnership amongst stakeholders for mobilizing resources and developing and promoting nature tourism, as well as equitable sharing of benefits.
- To impart knowledge on Forests and Wildlife among the visitors
- To garner public support for Wildlife Protection and Conservation.
- To provide rich and memorable experience of Nallamala ecosystem
- To inculcate eco-friendly lifestyles among public and promote positive attitude towards wildlife conservation

2) Expected outcome:

- Ecological recreation to the visitors
- Upgradation of economic status of local people
- Protection of forest and wildlife by involving local villagers**.**
- Environmental education

The community based eco-tourism plan of NSTR for the year 2023-24 to 2032-33 is as follows –

Eco Tourism Zones in Buffer area of NSTR

Sl. No.	Name of the Division	Eco-tourism Zone	Buffer area (in ha)
1	Atmakur	Bairluty (Velgode Jungle Safari)	2800
	Sub-Total >>		**2800**
2	Markapur	Dornal	86

3		Nagulavaram and Velgonda	7.80
	Sub-Total>>		**93.80**
Sl. No.	**Name of the Division**	**Eco-tourism Zone**	**Buffer area (in ha)**
4	Nandyal	Pacherla	6700
5		Mahanandi Jungle Safari	1000
	Sub-Total >>		**7700**
6	Giddalur	Diguvametta	875
7		Rangaswamy Gundam Jungle safari	447
8		Bodi Jungle Safari	893
	Sub-Total>>		**2215**
	Total>>		**12808.80**

Bairluty Eco-Tourism Zone

Velgode Jungle Safari:- Traversing through the Nallamala landscape on customized Jungle Safari Jeep and to appreciate the faunal and floral diversity of Eastern Ghats in Bairluty and Velgode Ranges.

Dornala Eco-Tourism Zone

Temporary Eco Cottages with Nature trail, Bird watching, trekking.

Veligonda Eco-Tourism Zone

Nature Trail, Bird watching, trekking and Boat safari in and around Veligonda Reservoir

Diguvametta Eco-Tourism Zone

Diguvametta Jungle Safari:- Traversing through the Nallamala landscape on customized Jungle Safari Jeep and to appreciate the faunal and floral diversity of Eastern Ghats, and historical landmarks in Gundlakamma Range. The area proposed is presently in ENB-I and Cumbum RF and falling in core and Buffer area of NSTR in Gundlakamma Range.

Rangaswamy Gundam Jungle Safari:- Traversing through the Nallamala landscape on customized Jungle Safari Jeep and to appreciate the faunal and floral diversity of Eastern Ghats on the way to Rangaswamy Gundam in Gundlakamma and Turimella Ranges.

Bodi Jungle Safari:- Traversing through the Nallamala landscape on a customized Jungle Safari Jeep, and to appreciate the faunal and floral diversity of the Eastern Ghats in Giddalur Range.

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	Mahanandi Jungle Safari	Nandyal Range	Buffer of NSTR	536, 537, 538, 565 & 566

The area proposed is at present in Buffer area of NSTR, and it includes a beautiful bamboo forest with water points and a jungle safari is to be proposed with temporary Eco-cottages in Mahanandi EEC Campus.

Mahanandi EEC Eco-tourism Zone

Bird Watching walking trail

Ahobilam Eco-tourism Zone

Diguvametta Eco-Tourism Zone

The area proposed is presently in ENB-I and Cumbum RF and falling in core and Buffer area of NSTR in Gundlakamma and Turimella Ranges.

Vana Vihari CBET, Diguvametta is situated in the dense Nallamala Forests between Nandyal and Giddalur towns. CBET, Diguvametta is equipped with Two (2) Air conditioned Wooden cottages and two (2) Air conditioned tents situated on the bank of a seasonal stream named Sagileru Vagu at Diguvametta. It is also provided with Children Park, EEC, Cafeteria, Public Toilets, Souvenir shop and Coffee shop.

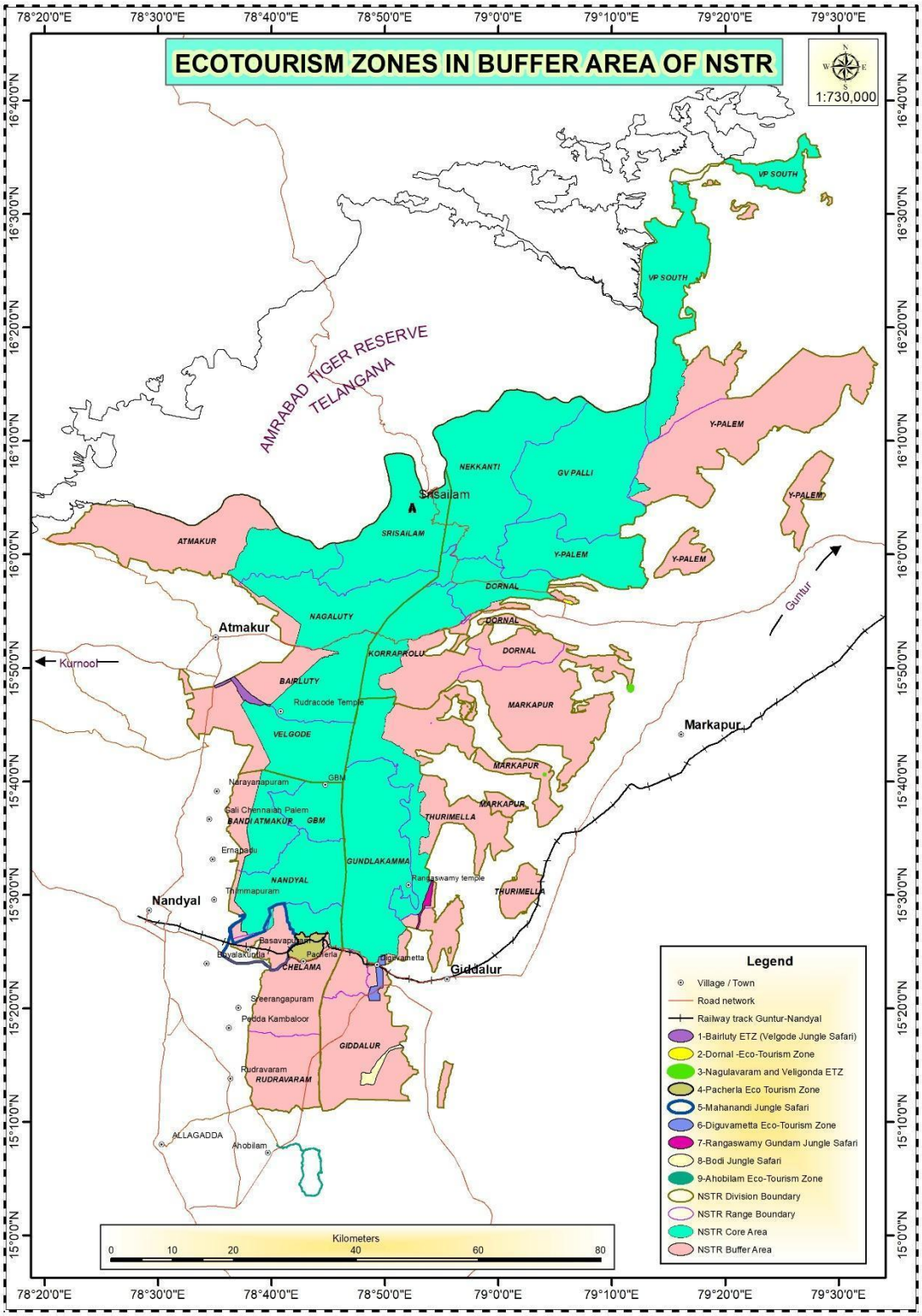
Diguvametta Jungle Safari traverses through diverse landscape of Nallamala including Bamboo patches, Grasslands. It offers rich environmental experience to visitors.

Eco-Trails and Eco-trekking through the nature:- Visitors are grouped into 5 to 7 persons and a forest guide is provided to take 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 inhabiting the Nallamala forest. Watching butterflies flying through the camps during rainy season is mesmerizing.

Souvenir shop & Camp fire:- The camp fire starts late in the evening and enough space is provided around the camp fire to enjoy the late evening. The goods like T-shirt, caps, pure honey etc., are available for sale at souvenir shop.

Map-18: Map showing the Ecotourism zones in Buffer area of NSTR



11.4. Interpretation Programme:

Interpretation programme for the Buffer areas in the Tiger Reserve is an important component for increasing awareness among the general public, providing information to the tourists and locals alike. It helps to increase support for conservation activities in the Tiger Reserve. A comprehensive interpretation programme for the Tiger Reserve should be formulated for each financial year and the components included in the various ongoing schemes.

The following components may be adopted while planning for the interpretation programme of the Tiger Reserve.

- **Signages and information boards:-**

  Signages to facilitate tourists and visitors to the Tiger Reserve should be strategically placed and in sufficient numbers especially in areas frequented by Tourists. Signages in the local language should also be erected as a large number local people also visit the Tiger Reserve. Sign boards providing information about the Tiger Reserve and the flora and fauna present should be also put up.

- **Environmental Education Centres: -**

  Environmental Education Centres should be established to create awareness about conservation among students, pilgrims, and other visitors, focusing on various aspects of wildlife and conservation. These centres may be equipped with audio-visual halls, as well as interactive and interpretative facilities, to educate and inspire visitors while enhancing their awareness of conservation.

11.5. Nature Education

Efforts to impart nature education to students in schools in and around the Tiger Reserve should be made a priority. This can be achieved by involving local students in conservation activities wherever feasible. In addition, the Tiger Reserve staff should actively organize programmes and competitions in schools and colleges, such as quizzes, drawing, elocution, and painting. The authorities should also facilitate student visits to the Tiger Reserve to foster a sense of ownership and responsibility for its conservation among local youth.

Educational literature about the Tiger Reserve should be developed and distributed among students. This material may include pamphlets, checklists of birds, reptiles, amphibians, and other species. Furthermore, the Tiger Reserve website should feature detailed information about its flora and fauna.

11.5.1. Trained guides for Jungle Safari / Nature / Eco walks:

There is a need for trained guides to accompany the jungle safari / nature / eco walks for tourists visiting the Tiger Reserve. Efforts should be made to provide quality training to the local youth who are interested to act as Guides for tourists who visit the Tiger Reserve. This will not only enhance the visitor experience but also provide a source of sustainable livelihood to the local communities.

CHAPTER – 12
Eco-Development and livelihoods



12.1. POLICY AND INSTITUTIONAL FRAMEWORK:

Eco development involves public participation which is an essential ingredient of this plan addressing people relating issues. The core will be free from all human use, the buffer will allow restricted human interface with a strong conservation bias. The main goal of eco development is the objective of maintaining diversity, productivity and the integrity of the PA. Eco-development is a site specific conservation friendly package of measures for environmentally compatible development and biomass use to complement management of buffer area.

The Primitive tribe group- the "Chenchus" and the Lambada - tribes also live in these villages. Besides, about three lakh cattle migrate from fringe villages into this buffer, every year. The people depend on the forests for their food requirements, day-to-day needs NWFP, and fodder for cattle and land for Agriculture. The degree of dependency of local people for their sustenance on buffer land is substantial which affects habitat of the Tiger considerably. Poverty coupled with unpredictable crop yield pattern make local people depend on buffer area. Excessive collection of fuel, fish and NWFP leads to the degradation

of the habitat. Most of the forest fires caused are intentional by the NWFP collectors. The denial of resource use to the stakeholders has created a substantial gap between the people and the park management initially and the extremists made their presence felt by taking up their issues.

12.1.1 Law and Order Situation in the past:

- No extremist activities
- Order of the time was enforcement
- Forests were intact and smuggling of timber was rare
- Tendency of animal population was on the rise
- Poaching is rare, peripheral and not from organized groups
- Plenty of water was available in the plains as the project act as large sink
- People living in good spirits - not much of Man-Animal Conflict

12.1.2 Genesis of the Problem:

- Upgrading of Sanctuary status to that of Project Tiger was perceived as threat to the local tribal.
- Certain restrictions like denial of access to resource use, relocation, developmental activities by other agencies etc., further aggravated the ire.
- They supported the people against the regulations and warned forest officials if they implement the project.

12.1.3 Nature and extent of problem:

The problems then, which were beyond the administrative control of N.S.T.R. was at the peak during 1993-94. Some of these problems were very sensitive and needed a careful handling. The problem specific treatments to each of the cases were the need of the hour.

Costs paid initially

- One Forest Range Officer was assassinated
- Property Loss due to blasting of buildings
- Staff lost morale and unable to perform duties which led to decline in Tiger population due to poisoning of the carcass
- People took advantage and caused habitat destruction
- Administration became weak to tackle the issue immediately.

12.1.4 Solutions and Opportunities:

Realizing the need of public participation in conservation in general, and tiger conservation in particular, the Government of India identified NSTR as one of the Eco-development program implementation sites.

12.2. Livelihood Support Initiatives through Village Micro-Plans

ECO-DEVELOPMENT ACTION PLAN – HISTORY

A detailed participatory Eco-development Action Plan for Nagarjunasagar - Srisailam Tiger Reserve was formulated by the Park Management. This plan is a compendium of micro-planning of all the resource dependent villages in and around the NSTR 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 improving the degraded eco-system on the other. This plan also recognized a need for shift of management strategy from total Regulatory to Participatory Management through reciprocal commitments and assist communities to build up sustained income through various site specific measures.

The local area needs were identified and addressed through a total of 60 income-generating schemes. To reduce the grazing pressure on the forested lands, the animal husbandry scheme was implemented which replaced goats with sheep. To reduce the fuel wood collection the alternative biogas and smokeless chullahs were provided. Alternative income generation programmes substantially have brought economic empowerment among the women. These programmes have also in many cases raised the resource dependents above poverty line and the purchasing capacity has also increased. This enabled the beneficiaries to save and create their own assets..

Participation of Women:-

Realizing the importance of the role of the women in conservation activities, 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 fuel wood collectors, alternatives such as the use of bio-gas and smokeless chullahs were emphasized at these meetings.

Violence 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 the people towards Forest Department activities changed. This was critical in ensuring the support of local people in further implementation of conservation activities. There is a great responsibility for meeting the genuine livelihood needs of the fringe villages to get their support in the cause of conservation. It is the need of hour for taking the local people in the management aspects including the decision making for the conservation of wildlife and security for the landscapes.

Realizing the importance of the eco development of the villages dependent on the forest and other resources of the buffer zone of NSTR and keeping in the mind the achievement and bottlenecks during the implementation of the eco development already done as stated above in the NSTR, the following strategies are recommended for the buffer zone of NSTR.

The eco development plan for the buffer zone of NSTR has been described division wise as the buffer zone of NSTR is spread in 2 divisions in three districts of Andhra Pradesh, by taking in to account the village level micro plans which have been already prepared during the previous World Bank aided forestry project.

12.3. Eco–Development and Livelihood Activities in Buffer of NSTR

12.3.1 Objectives:-

- Reduction of dependence of the local people on the forest by providing site specific, need based, participatory eco-development inputs to the stakeholders for rationalizing their resource dependency on the tiger reserve.
- Reduce man-animal conflict
- Habitat management and improvement in the existing habitat of tiger and its prey species through active involvement of local communities.
- Provide inputs for resource substitution, income generation, community welfare, eco-tourism for reducing the resource dependency of local people on forests.

- To provide Habitat Supplement to the Spillover population of wild animals from the core area with the active co-operation of stakeholder communities.
- To provide alternative resources to people which include biomass substitution, biomass generation and Eco-tourism, Silvi-pastoral practices, watershed management, artisanry as desired by the local people.
- To promote community participation to reduce the biotic pressure like illicit grazing, fuel wood consumption from buffer area and increasing participation in fire protection and anti-poaching efforts.

12.3.2 Specific Issues:

- Cattle population is high in the villages surrounding the buffer and the grazing pressure is a problem.
- Fuel wood collection from buffer area by the villagers residing in the listed villages.
- Scarcity of water during summer periods in certain patches forces the wild animals to move out from the habitat.
- The pressure from devotees during Shivaratri and Ugadi festival times is high.
- Cattle kills, human injuries and crop damages by wild animals especially in the fringe villages.

12.3.3. Broad Strategies:-

- Prompt payment of compensation
- Construction of semi permanent camps in buffer areas
- Fencing along the area of high intensity man - animal conflicts.
- SMC & Water resources management
- Creation and maintenance of fodder plots
- Rescue of straying wild animals
- Infrastructure & communication

12.3.4 Eco development activities:-

- Vaccination of domestic cattle
- Subsidized Biogas connections
- Drinking water facilities
- Community infrastructure development

- Livelihood training on apiculture, NTFP value addition

12.3.5 Villages inside buffer:

The following enclosures within buffer which stands included in buffer areas of NSTR:

Sl. No.	Name of the Division	Name of the enclosure included in buffer area
1	PT Atmakur	1) Sadharam Penta
2	PT Markapur	1) Murikimalla thanda
		2) Cherlo thanda
		3) Garnipenta
		4) Katamrajthanda
		5) P. Manthanala
3	PT Nandyal	1) Sarvanarasimhaswamy temple
		2) Ulleda Malleswaraswamy temple

The following villages are located outside the buffer area and having impact on buffer areas in NSTR:

Sl. No.	Name of the Division	Name of the Village
1	PT Atmakur	1) Mustapalli
		2) Siddapalli
		3) Siddapuram
		4) P.A. Puram
		5) Nallakalva
		6) Veerapuram
		7) Sivapuram Gudem
		8) Palem Cheruvu
		9) Bandinayani Palem
		10) Kottala Cheruvu
		11) Sripathirao Peta
		12) Indireswaram
		13) Indireswaram Gudem
		14) Vadlarama Puram
		15) Venkatapuram
		16) Yerraguduru
		17) Banumukkala
		18) Banakacharla
2)	PT Markapur	1) Nallaguntla
		2) Y. Cherlopalli
		3) Chilakacherla
		4) Yedavalli
		5) Pedda Bommalapuram
		6) Kalanuthala
		7) Bommilingam
		8) Venkatareddy Palli
		9) Mallapalem
		10) Komarolu
		11) Veerabhadhrapuram

		12) Boyalapalli

12.4. INTEGRATION OF RURAL DEVELOPMENT PROGRAMMES:

The following Rural Development Programmes which are implemented through the District Administration, can be utilized for reducing dependency of the fringe village people on the forest resources and to minimize the disturbances for the wildlife in the Buffer Area.

1) District Water Management Agency sponsored Mahatma Gandhi National Rural Employment Guarantee Scheme.

   The MGNREG scheme ensures 100 days minimum employment days to the applicants of the villages. The Park Management can create awareness and facilitate the scheme so that the dependence on the forests of the buffer zone by the fringe villagers will be reduced. The forest activities like weed removal, de silting of the tanks and kuntas, fire line creation, view line creation and maintenance, etc. in the peripheral parts of the buffer zone without disturbing the habitats in the buffer zone.

2) Animal Husbandry Department sponsored vaccination programme for cattle of the fringe villages around the Buffer Zone.

   Vaccination programme and providing sheep to replace goats have been proposed in some of the villages dependent on forest resources of Buffer Zone. In collaboration with the Animal Husbandry Department, these programmes can be successfully implemented.

   This will reduce to certain extent the grazing problem due to goats which are considered as destructive grazing animals compare to sheep. The reduction in grazing intensity and this will facilitate the grazing by herbivores. The population of the herbivores will increase in turn and prey base will improve resulting in the advantages of Tiger and other Carnivores. The vaccination of the cattle will result in the reduction in the transmission of diseases from the cattle to the wild animals. The vaccination can be taken village wise in collaboration with animal husbandry department.

   Stall feeding also has been proposed to minimize the disturbances by the cattle in the forest area of Buffer Zone. Stall feeding can be initiated with the support of the Animal Husbandry Department.

3) Ministry of Non-Conventional Energy Resources, Govt. of India and Non-Conventional Energy Development Corporation of Andhra Pradesh Limited (NEDCAP) sponsored solar lighting.

   Solar powered Street lighting has to be given in specific villages as per the Eco-development and livelihood activities. This can be done with the support of NEDCAP and Ministry of Non-Conventional Energy Resources, Govt. of India which give upto 30% subsidy for the solar powered street lighting systems. The installation of solar powered street light systems in the villages will get goodwill from the fringe villages towards the management of Buffer Area. This also will reduce the utilization of firewood / fuel wood from forest areas.

4) Integrated Tribal Development Agency (ITDA) sponsored welfare programmes for the Chenchu tribal in the fringe villages.

   The Tiger Reserve Management can utilize the Chenchu Protection Watchers who are being employed in the Forest Department for creating awareness about the programmes in the villages to which the Chenchu Protection Watchers belong. This awareness creation will result in more accessibility of the welfare programmes to the Chenchu villages, will improve the status of chenchu families to some extent and will reduce the disturbances to the wildlife in the Buffer Zone.

5) Girijana Cooperative Corporation (GCC) initiated activities for the collection of Minor Forest Produce.

   The main function of the GCC is to collect the minor forest produce from the tribals and to distribute the articles and food grains to the chenchus. The co- operation of the GCC and TR management in the sustainable collection of minor forest produce from the Reserve forests part of buffer (not from sanctuary part of buffer zone) will result in the minimum disturbance to the wildlife of buffer zone.

6) Medical facilities to the villagers in collaboration with Health Department can be provided to the fringe villages located around the buffer zone. This will be useful in getting support from the villagers towards the Tiger Reserve management.

7) Training for the cultivation/culturing of mushrooms

8) Capacity building in manufacturing of Jute bags, cloth bags and paper bags to replace plastics in fringe shops.

9) Training on handlooms, art and crafts, and agarbathis

10) Provision of Nannari seedlings in Recognition of Forest Rights (RoFR) lands and processing unit in the form of a small-scale industry.
11) Training on honey bee keeping.

12.5 MONITORING AND EVALUATION

The overall responsibility and administration for the eco-development and livelihood activities lies with the concerned Deputy Director. The day-to-day activities of the eco-development and livelihood initiatives are the responsibility of the Forest Range Officer concerned. The monitoring and guidance for the successful implementation of the eco-development and livelihood activities plan will be done by the Field Director, Project Tiger Circle, Nandyal. The Chief Wildlife Warden, A.P. Mangalagiri will give critical inputs and evaluate the Eco-development and livelihood activities for strengthening the same further. The Wildlife Capacity Building Centre located at Sundipenta, will do research and training on the aspects of participatory management, Eco-development and livelihood activities for the fringe villagers.

Activities	Overall administration & responsibility	Day to day field responsibility	Monitoring and guidance	Critical inputs & evaluation
Providing Medicare to fringe villagers	DD	FRO	FDPT Nandyal	Chief Wildlife Warden, AP
Vaccination to cattle	DD	FRO	FDPT Nandyal	Chief Wildlife Warden, AP
Installation of Biogas plants	DD	FRO	FDPT Nandyal	Chief Wildlife Warden, AP
Installation of Solar street lights	DD	FRO	FDPT Nandyal	Chief Wildlife Warden, AP
ITDA welfare activities / facilitation in fringe villages	FRO	FSO	DD	FDPT Nandyal
Providing drinking water facilities	DD	FRO	FDPT Nandyal	Chief Wildlife Warden, AP
Awareness training to local villagers	DD	FRO	FDPT Nandyal	Chief Wildlife Warden, AP
Human resource development for field staff for attitudinal change	DD	FRO	FDPT Nandyal	Chief Wildlife Warden, AP

Research on participatory management aspects and eco-development	ACF Biodiversity, Srisailam	Research Scholars	FDPT Nandyal	Chief Wildlife Warden, AP

CHAPTER – 13

IMPLEMENTATION STRATEGIES



The buffer of a tiger reserve as a "multiple use area" encompasses conservation or community reserves, apart from reserve lands, private holdings, villages, towns and other production sectors as indicated above. It requires coordination at various levels for achieving the objectives. The following strategies shall be followed:

a) The buffer zone shall be under the unified control of the Field Director of the tiger reserve as much as possible.

b) The existing land uses in the buffer zone can continue with due mainstreaming of wildlife concerns as indicated above. Forestry, Joint Forest Management, Eco-development activities ensuring coordination with other sectors will be carried out by the Deputy Directors concerned.

c) The working plan provisions for forest areas in the buffer zone would be implemented after duly mainstreaming wildlife concerns and due permission of Principal Chief Conservator of Forests (Wildlife) & Chief Wildlife Warden A.P.

d) Eco development as well as Joint Forest Management activities in the area would be implemented using a participatory strategy as codified by the State, through village forest committees and eco development committees.

e) Integrated development (eco-development and developmental activities of District Administration) should be innovatively used for addressing conflicts arising on account of pressures of forest resources from local people.

13.1. STATE LEVEL MONITORING COMMITTEE

To facilitate coordination and mainstreaming of wildlife concerns at the field as well as state level, the following Committees are proposed:

(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 their prey within the State of Andhra Pradesh.

(2) The Steering Committee shall consist of –

(a) The Hon'ble Chief Minister – Chairperson

(b) The Hon'ble Minister of Environment, Science and Technology – Vice-Chairperson

(c) Official members not exceeding five in number including the Field Director of tiger reserve and one from the State government 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 welfare

(e) Two members from the State Tribal Advisory Council;

(f) One representative each from the state government line departments

(g) Two members from Panchayat Raj and Social Justice Department

(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.

13.2. TIGER CONSERVATION FOUNDATION AND DISTRICT LEVEL CO-ORDINATION COMMITTEE

In pursuance 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 guidelines, the Govt. of Andhra Pradesh registered the society under the Societies Registration Act, XXXV of 2001 on 26th day of August 2008.

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:

1	Special Chief Secretary / Principal Secretary / Secretary to Government, Environment, Forests, Science & Technology Department, A.P.	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 the 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 stakeholder development and eco-tourism;

(f) to support research, environmental education and training in the above related fields.

Introduction of Collection of Environmental Maintenance Charges (EMC):

The road from Hyderabad to Srisailam and Kurnool-Guntur to Srisailam passes through the Core area of Nagarjunasagar Srisailam Tiger Reserve, the entry point being Mannanur from Hyderabad side, Bairluty from Kurnool side and Dornala from Guntur side. The traffic is prohibited on this road from 9.00 P.M. to 6.00 A.M and it is essential to restrict the movement of vehicular traffic between Bairluty to Korraprolu road (Kurnool-Guntur National Highway passing through Core area of Tiger Reserve) from 9.0 PM to 6.0 AM and regulate the traffic 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. In addition, many Wild animals are getting killed due to heavy traffic and speedy movement of vehicles. 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.

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

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.

13.3. Formation of Eco-Development Committees (EDCS), Confederation of EDCS and Other Supporting Institutions like Self Help Groups and Nature Clubs

Proposed organizational network:

Local Advisory Committee:

At Range level local advisory committee to be setup by concerned Deputy Director. It is to be headed by concerned Forest Range Officer and comprises of local forest officials and EDC members to ensure participatory decision making and sustainable development.

District level co-ordination committee:

At the District level, a co-ordination committee with the Collector as the chairman and the concerned Deputy Directors as the member secretary to be setup by the concerned District Collectors. This committee, after enlarging its base by including various other development departments and Panchayat Raj institutions, will be the main co-coordinating institution for various departments participating in the Programme. This committee will discuss the participation of various development agencies in the overall Programme, will sort out any inter departmental problems and in general facilitate and intensify the Rural Development Programme in the Project Tiger in the buffer zone.

Support Teams:

Composition of planning and implementation support teams consisting of an Eco-development officer/research officer who will provide overall guidance and supervision with the assistance of the contracted sociologists and ecologists to both the DDs.

NGO Support:

Through contractual arrangements, NGOs would provide personnel and expertise in participatory approaches to support the micro planning and implementation teams. The NSTR buffer spreads over parts of three revenue districts The target villages are scattered over seven mandals in all the three districts. To implement eco-development programmes successfully over such an extensive area it would be an herculean task for the project authorities. It requires a network of an organised web of team.

The ultimate long term goal of eco-development is biodiversity conservation and people shall be made aware of that. In order to achieve this goal, the public participation needs to be seen through the reduced number of incidences that cause damage to the TR.

The ultimate output of participation is to have reduced number of intentional fires, less grazing and more stall feeding, adoption of alternatives to forest based products, conservation of fuel, and no poaching. All these things are to be put before the people by the park management and seek their opinion to gain the best possible support.

13.4. INTEGRATION OF RURAL DEVELOPMENT PROGRAMMES

- A single line administration is essential to provide livelihood support and various employment options to the communities residing in the buffer area.
- The coordination between Integrated Tribal Development Agency (ITDA), District Rural Development Agency, District water management agency, agriculture, horticulture, health, animal husbandry and forest department is the key for the successful implementation of various welfare programmes designed and implemented by various government departments.
- The forest department will play the role of facilitator and bring all the departments on same platform for better implementation of welfare programmes and to reduce local people dependency on the forest.
- Proper management of water resources and augmentation to these water sources will further help in achieving target of integrated rural development in buffer areas.

13.5. MONITORING AND EVALUATION WILL BE DONE THROUGH

a. Review of developmental programmes on regular basis
b. Regular assessment of habitat and wildlife monitoring
c. Input as well as output monitoring
d. Short term as well as long term studies to assess the impact of developmental programmes on buffer areas by considering various factors such as reduction in fire incidence, cattle kills, employment status, cattle grazing, collection of grasses and NTFPs.
e. Evaluation at local, state level as well as independent agencies.
f. The local level evaluation will be done by Field Director for every one year.
g. The state level evaluation will be done by Chief Wildlife Warden for every two years
h. At local level adequate representation of NGOs, eminent persons from wildlife conservation field will be ensured.

i. Independent evaluation on the lines of Management Effectiveness Evaluation (MEE) will be done by Government of India.

CHAPTER – 14

Mainstreaming Strategy with various Production Sectors



Mainstreaming tiger and other wildlife conservation concerns in various production sectors is imperative for the buffer zone to be viable and fulfill its objectives. This would involve modification of developmental activities / practices in the key production sectors to make them more 'conservation friendly'. The process is sector as well as landscape specific. However, some generic suggestions based on environmental guidelines issued by the Ministry of Environment and Forests for developmental projects in different sectors are given below for guidance.

14.1. FORESTRY SECTOR (Affects Directly):

Forest in buffer are vulnerable to various pressures and interference. Development in this zone is essential to counter the adverse impact of grazing, lopping, illicit felling, fire, unsustainable removal of NTFP and poaching, regulation of harvesting of existing plantation and regulating the extraction of bamboo for meeting the bonafide needs of the local people so that wild animals from core may use the zone frequently to meet their habitat requirement. The main streaming strategies for the forestry sector in the buffer area are prescribed as follows:

- Monitoring Wildlife presence in standardized formats on a daily basis using M-STrIPES
- Foot patrolling by staff to ensure protection.
- Exchange of Wildlife presence data with nearby protected area or tiger reserve.
- Monitoring of carnivore kills
- Monitoring of water points
- Timely payment of compensation for livestock depredation by carnivores.
- Regulating livestock grazing in areas prone to wild ungulates
- Payment of compensation for crop damage by wild animals
- Fire protection with the help of Village Forest Committees
- Review of wildlife status in the meetings of Forest Development Agency
- Regulating collection of Non Timber Forest Produce (NTFP)
- Monitoring village cattle for disease
- Maintenance of village level Wildlife crime dossier
- Protection of riparian margins
- Staggering of forest stands belonging to different age groups
- Maintaining grasslands
- Retention of endemic species
- Incentives to local communities from the fund accruing through recycling of gate receipts, as a reciprocal commitment for their involvement in addressing wildlife concerns, forming part of a MoU with the Tiger Conservation Foundation in the village level micro plan.

14.2. AGRICULTURE SECTOR:

The mainstreaming strategies for the agricultural sector in the buffer area are prescribed as follows:

- Adopting ecological and agricultural practices as a land use to produce food as well as to conserve wildlife
- Maintaining wildlife habitat
- Discouraging sudden change in cropping patterns (*viz*_lure crops) to avoid human-wildlife conflicts

- Discouraging water intense crops such as chilli, cotton and instead less water intense crops shall be promoted.
- Maintaining a habitat mosaic, *viz.* fallow land, fruit orchard, plantation, planting of spices, small timber etc., to mimic natural forest.
- Promoting soil conservation
- Providing economic incentives for safeguarding wildlife concerns
- Providing incentive for carbon, water and other environmental services to local people.
- Compensating losses due to wildlife
- Recognizing the value of traditional farming in conservation
- Fostering use of green manure and discourage use of chemical manures and pesticides.
- Facilitating marketing of local products through the Tiger Conservation Foundation.
- Recognizing properly rights of farmers for genetic resources.
- Promoting rural tourism
- Use of market instruments through the Tiger Conservation Foundation (production certificate for organic products)

14.3. INTEGRATED DEVELOPMENT (Eco-Development, Development through Dist. Administration)

(i) Eco-development

The mainstreaming strategies for the eco-development sector in the buffer area are prescribed as follows:

- Participatory village level planning and preparation of village level plans for eco-development
- Providing inputs for resources substitution, income generation, community welfare, eco-tourism for reducing the resource dependency of local forest dwellers.
- Ensuring reciprocal commitments with the local people through respective eco-development committees, forming part of a MoU in the micro plan for safeguarding wildlife interests.

(ii) Development through District Administration

This involves multiplicity of Sectors operating in the landscape pursuing development, where wildlife concerns have to be integrated through formal contracts / agreements between the Tiger Conservation Foundation, District Authorities and Eco-development

committees. The responsibilities of various parties should be spelt out in the contracts / agreements for safeguarding wildlife concerns along with common commitments. Normally, such contracts / agreements should discourage any detrimental practice and assign responsibility to the community for carrying out some interventions. In return, the community should receive an assurance from the Tiger Reserve Authorities for access to certain natural resources in the area or benefits.

14.4.TOURISM

The activities of tourism also have a direct impact on the tiger and wildlife conservation. The strategy shall be to promote only regulated and low-impact tourism with a principle that "Tourism exists for parks and not parks for tourism". The mainstreaming strategies for the tourism in the buffer area are prescribed as follows:

- Ensuring proper garbage disposal.
- Avoiding / safe guarding passages / corridors used by wild animals.
- Obtaining contributions from private commercial tour operators and lodge owners for local community development.
- Providing local shopping facilities to tourists through the Tiger Conservation Foundation, involving the eco-development committees.
- Community-based eco-tourism possibility may be explored
- Facilitating Wildlife eco-tourism involving local communities.

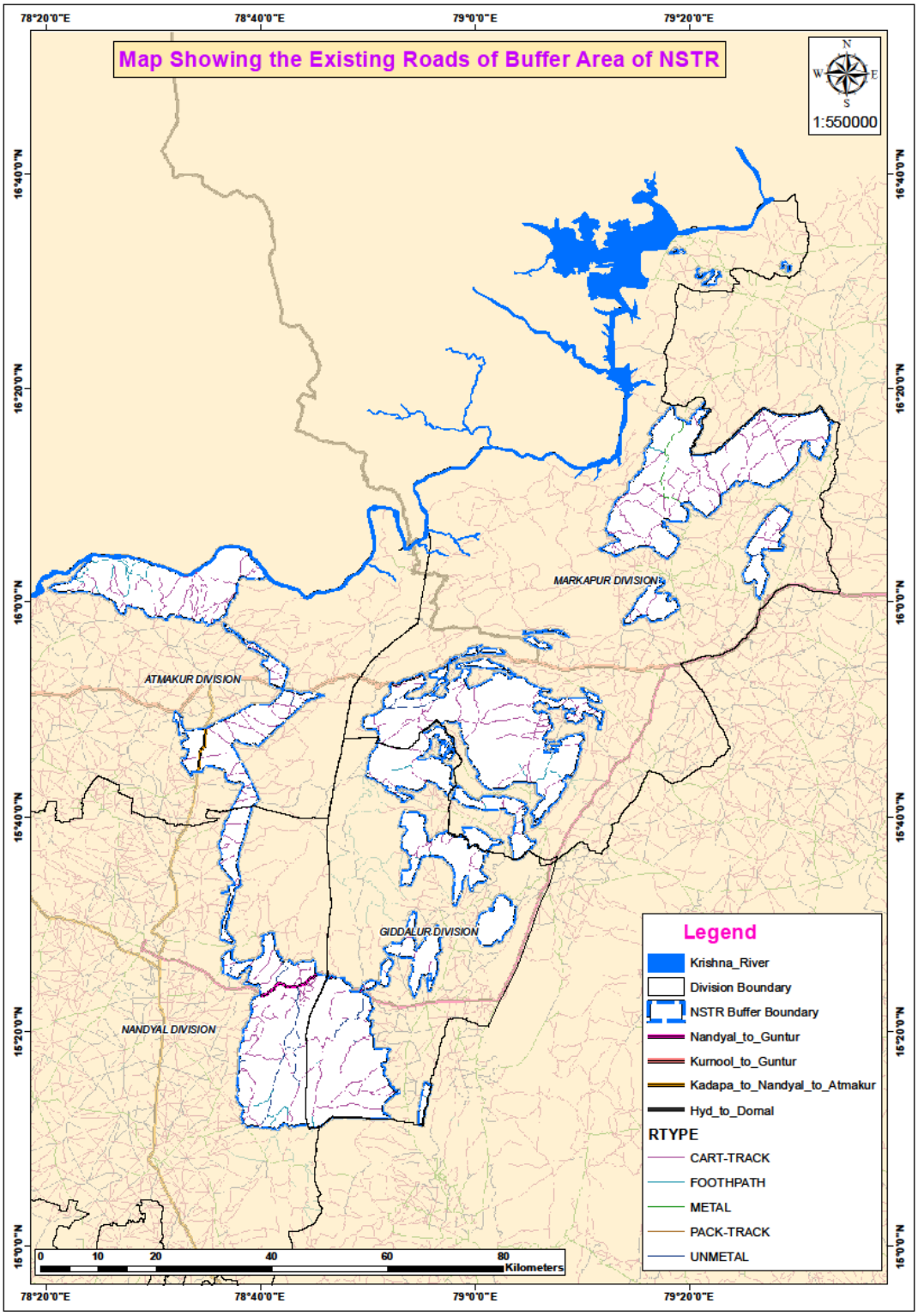
14.5. ROAD TRANSPORT SECTOR:

The movement of the vehicles day and night causing lot of disturbance to the wildlife in the forests area have a direct impact on the tiger and other wildlife conservation. Hence, there is a need for controlling the speed level and regulation of traffic flow from the major roads in order to safe guard floral and faunal values and for mainstreaming towards tiger conservation. The mainstreaming strategies for the road in the buffer are prescribed as follows:

- Safeguarding floral / faunal values en route
- Speed regulations.
- Regulation of traffic flow and control speed leel
- Control of noise pollution as per Noise Poluttion Regulations
- Adoption of cut and fill technology in construction
- Establishment of local vegetation on filled up area and on roadside.
- Adoption of erosion control measures

- Protection of drainage system
- Dumping of excavated material on ecological principles.
- Safeguards to prevent road and fires
- Compensation for habitat fragmentation and barrier affect
- Restricting the travel routes inside the sanctuary during night time.

Map 19: Map showing Road Network in Buffer Area in NSTR



14.6. INDUSTRY SECTOR:

The mainstreaming strategies for the Industry sector in buffer area are prescribed as follows:

- The prescriptions made for the eco sensitive zone shall be followed to foster wildlife concern.
- Construction activities should not lead to depletion of forests.
- Preventing pollution on account of gaseous and other affluents.
- Organizing service systems relating to drinking water, drainage, garbage disposal to maintain the wildlife habitat.

14.7. IRRIGATION PROJECTS

The mainstreaming strategies for the Irrigation Projects in the buffer area are prescribed as follows:

- Safeguards for preventing landslides on the periphery of reservoir
- Safeguards for potential seismic impact on account of reservoir loading
- Monitoring recharge of ground water
- Identification of areas prone to siltation and erosion
- Retention of trees in the impounded area to facilitate roosting of birds
- Managing eco-tourism through the Tiger Conservation Foundation in the impounded area
- Assisting the management in patrolling the water body
- Providing an attractive relocation / rehabilitation package for relocation (if any) with provisions for handholding behind the process

14.8. TEMPLE TOURISM

The mainstreaming strategies for Temple tourism in buffer area are prescribed as follows:

- Preparation of a master plan and adherence to its normative standards for crowd regulation and visitor facilitation
- Ensuring proper garbage disposal
- Providing accommodation facilitates for pilgrims in nearby satellite township
- Architectural code of civil works as contained in the master plan should blend with the environment
- Avoiding trail paths inside the sanctuary corridors used by wild animals
- Avoiding contamination / pollution of local streams and water bodies
- Providing local shopping facilities to tourists through the Tiger Conservation Foundation, involving the eco-development committees.

14.9. COMMUNICATION PROJECTS SECTOR:

The mainstreaming strategies for the Communication projects sector in the buffer area are prescribed as follows:

- The prescription made for the eco sensitive zone shall be followed to foster wildlife concern.
- Avoiding wetlands, animal corridors and habitats rich in wildlife
- Avoiding agricultural land, streams, forest areas and slopes
- Institutionalizing a system of patrolling for safeguarding the use of transmission lines and cleared strips for poaching.
- The maximum width (w) of Right of Way for the transmission lines on forest land for varying kv lines is 7 m (11 kv), 15m (33 kv), 180 m (66 kv), 22 m (111 kv), 27 m (132 kv), 35 m (220 kv) and 52 m (400 kv)
- Maintaining the prescribed clearances for different KV lines within the Right of Way, which may be widened in areas having tall trees or elephants.

14.10. ECO SENSITIVE ZONE:

The Eco-sensitive Zone is declared and delineated all along the boundary of NSTR from ecological and environmental point of view to conserve and protect the rich biodiversity. The eco-sensitive zone is falling in buffer area and it acts as a transition zone and the activities in this zone will have a direct impact on the Tiger and other wildlife conservation. Most of the activities in this zone would be of regulatory nature. The mainstreaming strategies in the eco-sensitive zone falling in the buffer area are prescribed as follows:

a) The activities are broadly classified as prohibited, restricted and permissible.
b) The activities such as commercial mining, setting of saw mills, setting of pollution causing industries, establishment of major hydroelectric projects etc. are prohibited.
c) The activities such as felling of trees, establishment of hotels, use of natural water resources, use of polythene bags, widening of roads, movement of vehicular traffic at night, erection of electrical cables etc., are regulated.
d) The activities such as ongoing Agriculture, rain water harvesting, organic farming, use of renewable energy sources, adoption of green technology are permitted and shall be actively promoted.

CHAPTER 15

Miscellaneous Issues



15.1. Housekeeping of Departmental Elephants

There are interior and inaccessible areas in this tiger reserve which cannot be monitored by vehicles. The following elephant camps are proposed in the current Tiger Conservation Plan:-

- Bairluty (Project Tiger, Atmakur Division)
- Peddacheruvu (Project Tiger, Atmakur Division)
- Pacherla (Project Tiger, Nandyal Division)
- Diguvemetta (Project Tiger, Giddalur Division)
- Peddapenta (Project Tiger, Markapur Division)

Each camp will have a minimum of 2 elephants and a maximum of 3 elephants.

15.2. Wildlife Health Monitoring:-

The Tiger Reserve has a Wildlife Dispensary adjacent to Bairluty Eco tourism located at Nagaluty Range of Project Tiger, Atmakur. The team is headed by (2) Veterinarians, (1) Para vet (2) Drivers and Rescue Team consisting of (5) members. The wildlife dispensary complex has a fully functional operation theatre, lab for basic diagnostics, temporary holding and treatment facility for wildlife, postmortem room and vehicles for rescue, doctors etc.

The team at the wildlife dispensary is responsible for monitoring diseases in wildlife, conducting postmortems with subsequent investigations if required and rescue and rehabilitation of wildlife. They also undertake immunization programmes of domestic animals in the park periphery in association with Animal Husbandry department.

1. List of equipment available at Wildlife Dispensary Bairluty

Location	Equipment available
Operation room	(i) Operation table (ii) Patient monitor (iii) Autoclave (iv) Medicine Trolley
Clinical Laboratory	(i) Microscope (ii) Centrifuge (iii) Deep Freezer (iv) Cryo-freezer (v) Sample storage area (vi) Work table
Doctor's Office	(i) Doctor's desk (ii) Computer set with table (iii) Locker (iv) Notice board
Hall	(i) Refrigerator for snake anti-venom and vaccine stock (ii) Personal Protective Equipment area – hand sanitizer, foot wear/shoe cover, gloves, facemask, head cover, etc.
Mobile rescue vehicle	(i) Post mortem kit (ii) Treatment kit (iii) Snake rescue kit
Field rescue equipment	(i) Nets (ii) Night vision binocular (iii) Camera traps – Infrared and flash mode (iv) Microchips with scanner (v) Portable loud speaker with microphone (vi) Rescue Safety suits

	(vii) Walkie talkies (viii) Rechargeable LED lights (ix) Metal detector (x) Stretcher (xi) Handy cam (xii) Thermometers (xiii) Surgical kit (xiv) Animal rug (xv) First aid Kit (xvi) Anti-bite gloves (xvii) Foldable chairs (xviii) Vaccine/Sample Transporting containers (Cold chain) (xix) Search lights (xx) Tool kit box

2. Details on number and size of trap cages available

Table 11: Cages available in Atmakur Division

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	--	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 (of 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 12: Number and details of rescue operations conducted

Sl. No	Date of Admission / intervention	Species	Stage / Age	Sex	Place of rescue	Cause of displacement	Type of intervention
1	2	3	4	5	6	7	8
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, Velugodu	Scavenging for food	Trap Cage
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 August 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 October 2022	Indian Pangolin	Adult	Female	VP South Range, Markappur	Poached	Hand caught
26	28 October 2022	Indian Rat Snake	Adult	Female	Sai Balaji School, Markapur	Accidental entry into human habitat	Snake bag
27	20 November 2022	Montagu's Harrier	Juvenile	Male	Markapur	Sick or injured	Hand caught
28	27 November 2022	Cobra	Adult	Unidentified	Ganapathi Check post, Dornala	Settled adjacent to human habitat	Snake bag

5. Details of tranquilizing equipment for animal rescue

A Tranquilizing gun (Syringe Projector) of the make Dan-inject - Double Barrel is available along with necessary accessories, anaesthetic kit, foot pump, CO2 cartridges and dart syringes (various sizes). An experienced tranquilizing team is available. The commonly used anaesthetic drugs Xylazine hydrochloride and Ketamine hydrochloride are maintained.

6. Details on number of teams available for rescue

Only one team is available which comprises of 2 experienced veterinary doctors, 1 attender, 4 additional staff and 2 drivers.



WILDLIFE HEALTH DISPENSARY AT BAIRLUTY



LEOPARD RESCUE AT POTHIREDDYPADU



SLOTH BEAR RESCUE AT BHANAKACHERLA, VELUGODU RANGE



WILD BOAR RESCUE AT BHANAMUKKHALA, VELUGODU RANGE

15.3. Mortality Survey:

All observed mortality of wildlife which is abnormal undergoes a postmortem in this tiger reserve. Postmortem of all Scheduled-I animals are conducted as per procedure given in the Wildlife (Protection) Act, 1972 and amendments thereafter. As per SoP (Standard Operating Procedure) of NTCA (National Tiger Conservation Authority), the carcasses of big cats such as tiger and leopard undergo postmortem overseen by a committee specified by NTCA and samples are sent for examination to various institutes.

If any unnatural deaths of wildlife are observed, postmortems are conducted and samples are sent for examination to various laboratories to determine the cause of death. This proactive approach in the Tiger Reserve has helped contain an outbreak of the African swine flu in December 2023.

Table 13: Post Mortem Summary

Post Mortem Summary								
Sl. No.	**Date**	**Species**	**Stage of growth**	**Sex**	**Place of death**	**Range**	**Cause of Death**	**Description of cause of death**
1	13-04-2022	Sambar Deer	Adult	Male	Sikharam Check post	Srisailam	Hypovolumic Shock	Predator Attack
2	25-04-2022	Wild Boar	Adult	Female	Gantamatam, Srisailam	Srisailam	Stomach Impaction	Plastic, cooked rice, and masala in stomach
3	25-04-2022	Wild Boar	Adult	Male	Yenugula Cheruvu, Srisailam	Srisailam	Unidentified	Carcass Decomposed
4	07-05-2022	Wild Boar	Adult	Male	Srisailam By-pass road	Srisailam	Hypovolumic Shock	Road Traffic Accident

5	17-07-2022	Wild Boar	Juvenile	Male	Srisailam By-pass road	Srisailam	Dehydration from severe diarrhea	Intestinal Parasitic overload
6	22-08-2022	Wild Boar	Adult	Female	Srisailam	Srisailam	Multiple cardiac affections from fatty tumerous overgrowth	Polythene bags, Rice, complicated to Obesity
7	04-10-2022	Wild Boar	Juvenile	Female	Rajaka Sathram Srisailam	Srisailam	Unidentified	Carcass Decomposed
8	07-10-2022	Wild Boar	Juvenile	Male	Srisailam Annadhanam sathram	Srisailam	Hemorrhage and Hypovolumic Shock	Lung Worm and Stomach ulcers
9	17-10-2022	Wild Boar	Juvenile	Male	Gantamatam, Srisailam	Srisailam	Foreign body obstruction	Plastic covers and nylon rope
10	19-10-2022	Wild Boar	Sub adult	Male	BC Colony, Srisailam	Srisailam	Multiple - Respiratory failure and Foreign body Obstruction	Lung Worm and Polythene blockage of stomach
11	19-10-2022	Wild Boar	Sub adult	Female	BC Colony, Srisailam	Srisailam	Unidentified	Carcass Decomposed
12	29-10-2022	Wild Boar	Sub adult	Female	Near temple annadhanam area	Srisailam	Hemorrhage and Hypovolumic Shock	Road Accident and Polythene obstruction of Stomach
13	30-10-2022	Wild Boar	Sub adult	Male	Kothapeta, Srisailam	Srisailam	Unidentified	Carcass Decomposed along with polythenes and plastic bangles in stomach
14	10-11-2022	Hanuman Langur	Adult	Female	100 Cottage, pathala ganga road	Srisailam	Hypovolumic Shock	Road Traffic Accident
15	10-11-2022	Hanuman Langur	Juvenile	Male	100 Cottage, pathala ganga road	Srisailam	Hypovolumic Shock	Road Traffic Accident
16	15-11-2022	Wild Boar	Juvenile	Male	Filter house, Srisailam	Srisailam	Septic shock	Lung infection and Plastic rope obstructin of stomach
17	27-11-2022	Wild Boar	Old age	Male	Munuswamy Ashramam	Srisailam	Unidentified	Carcass Decomposed
18	04-12-2022	Wild Boar	Adult	Female	ST School, Sundipenta	Srisailam	Asphyxia	Snare causing respiratory passage cut-off
19	16-12-2022	Wild Boar	Adult	Female	Kothapeta, Srisailam	Srisailam	Foreign body obstruction	Stomach block with nylon ropes and Polythene bags,

								Rice consumption causing Obesity
20	21-12-2022	Hanuman Langur	Adult	Female	AP GenCo Quarters, Sundipenta	Srisailam	Hypovolumic Shock	Road Traffic Accident
21	03-01-2023	Wild Boar	Adult	Male	BC School, Sundipenta	Srisailam	Unidentified	Carcass Decomposed
22	31-01-2023	Wild Boar	Adult	Male	Ghantamatam, Srisailam	Srisailam	Foreign body obstruction	Stomach block with nylon ropes and Polythene bags. Stomach contents mainly rice based
23	12-02-2023	Wild Boar	Adult	Female	Kothapeta, Srisailam	Srisailam	Unidentified	Carcass Decomposed
24	22-02-2023	Wild Boar	Adult	Female	Yerrakunta, Sunnipenta	Srisailam	Hypovolumic Shock	Predator Attack
25	02-03-2023	Wild Boar	Adult	Female	Kotthapetta	Srisailam	Hypovolumic Shock and Lipidosis	Lung and Liver Affections along with Obesity and lipidosis (probably from regular rice consumption)
26	15-03-2023	Wild Boar	Adult	Male	Kotthapetta	Srisailam	Lipidosis	Respiratory Failure. Obesity and Lipidosis (probably from regular Rice consumption)
27	17-03-2023	Wild Boar	Juvenile	Male	Tourist bus stand	Srisailam	Hepatitis and internal hemorrhages	Liver Failure and Road Traffic Accident
28	03-04-2023	Wild Boar	Adult	Male	Gantamatam, Srisailam	Srisailam	Unidentified	Carcass Decomposed
29	03-04-2023	Wild Boar	Juvenile	Male	Gantamatam, Srisailam	Srisailam	Hepatitis and Foreign body obstruction	Lung infection and Plastic rope obstructin of stomach
30	12-04-2023	Leopard	Adult	Female	Dayyalamada, Pecheruvu East Beat	Srisailam	Enteritis and Rectal Prolapse	Stomach infection
31	20-04-2023	Hanuman Langur	Adult	Female	Lingalagattu check post, Sundipenta	Srisailam	Electrocution	Electric Shock
32	25-04-2023	Wild Boar	Juvenile	Male	Kotthapetta	Srisailam	Unidentified	Carcass Decomposed
33	29-04-2023	Small Indian Civet	Adult	Female	Nizamkunta	Srisailam	Hypovolumic Shock	Road Traffic Accident

34	05-05-2023	Wild Boar	Adult	Unidentified	Rajula sathram	Srisailam	Unidentified	Carcass Decomposed
35	10-05-2023	Hanuman Langur	Adult	Female	Number one canteen, Srisailam	Srisailam	Dystocia	Generalized Infection - Sepsis
36	10-05-2023	Hanuman Langur	Adult	Female	ITI college, Sunnipenta	Srisailam	Electrocution	Electric Shock
37	19-05-2023	Sambar Deer	Adult	Female	BC School backside	Srisailam	Hypovolumic shock	Predator Attack
38	29-05-2023	Wild Boar	Juvenile	Unidentified	Kotthapetta	Srisailam	Unidentified	Carcass Decomposed
39	26-06-2023	Wild Boar	Adult	Female	Railway Cottage	Srisailam	Fibrosis of Heart tissue along with multiple organ failure	Organ Failure
40	29-06-2023	Hanuman Langur	Adult	Female	Sunnipenta	Srisailam	Electrocution	Electric Shock
41	29-06-2023	Bonnet Macaque	Adult	Male	Sunnipenta	Srisailam	Electrocution	Electric Shock
42	12-07-2023	Wild Boar	Adult	Female		Srisailam	Unidentified	Carcass Decomposed. Severe Fatty Deposits, leading to obesity.
43	01-08-2023	Wild Boar	Adult	Male		Srisailam	Unidentified	Carcass Decomposed. Severe Fatty Deposits, leading to obesity.
44	11-08-2023	Wild Boar	Adult	Female	Outer Ring Road, Srisailam	Srisailam	Hemorrhage and Hypovolumic Shock	Road Traffic Accident
45	14-08-2023	Wild Boar	Sub adult	Male	Ghantamatam, Srisailam	Srisailam	Unidentified	Carcass Decomposed

CHAPTER – 16

Organization, Administration and Budget

16.1 Buffer Area Coordination Committee and Its Linkages with Tiger Steering Committee & Tiger Conservation Foundation

16.1.1 Buffer area coordination committee / Expert committee will comprise of the following officers:

- Field Director as Chairman
- Deputy Directors as members
- District Forest Officers of neighboring divisions as members
- Sub DFOs as members
- Assistant Conservator of Forests, Biodiversity, Srisailam as Member
- Forest Range Officers as members
- Honorary State Wildlife Warden, A.P.
- Outside expert for tiger monitoring
- Prominent Wildlife NGO

The expert committee will meet every 6 months to review tiger protection measures and address issues related to tiger straying, migration and protection. Other aspects of protection such as grazing, diversion of forest land etc., which need coordination over a large area will be taken up during these meetings.

16.1.2 State Level Steering Committee:

The Conservator of Forests & Field Director, Project Tiger Circle, Nandyal has sent a proposal to the Principal Chief Conservator of Forests (Wildlife) & Chief Wildlife Warden, A.P. Mangalagiri vide Rc.no. 1414/2021/TO, Dated. 17.01.2024 to constitute State Level Steering Committee with the following members.

Hon'ble Chief Minister, Andhra Pradesh	Chairperson
Hon'ble Minister for EFS&T Department, A.P.	Vice-Chairperson
Special Chief Secretary / Prl. Secretary to Govt. EFS&T Dept., A.P.	Member
Principal Chief Conservator of Forests & Head of Forest Force, A.P.	Member

Principal Secretary to Govt., Panchayat Raj & Rural Dev.Dept., AP	Member
Field Director, Nagarjunasagar Srisailam Tiger Reserve (NSTR)	Member
Commissioner of Tribal Welfare, A.P.	Member
Commission of Women Empowerment & Social Justice	Member
Dr. Karthikeyan Vasudevan, Director, Laboratory for the Conservation of Endangered Species (LaCONES), Hyderabad	Member
State Director, World Wide Fund (WWF), India Hyderabad	Member
President, Hyderabad Tiger Conservation Society (HyTiCoS)	Member
Honorary State Wildlife Warden, Andhra Pradesh	Member
Member, State Advisory Council	Member
Principal Chief Conservator of Forests (Wildlife)& Chief Wildlife Warden, A.P	Member Secretary

16.2 Coordination with EDCS, Confederation and Other Line Agencies / Departments / Production Sectors.

16.2.1 Eco-Development Committees:-

An Eco-Development Committee (EDC) is similar to JFMCs, but meant for villages in Protected Areas and their buffer zones. Their setup, working, role, responsibilities, powers, funds etc. are as per the state level orders. Their area of operation is restricted to protected Areas, and forest and non-forest areas near protected areas. EDCs are set up with twin objectives – to protect wildlife and biodiversity and also undertake eco-development activities in the villages.

As their setup and operations are similar to JFMCs, the guidance in this Handbook can be utilized for setting up and facilitating EDC operations as well

Rationale for EDCs:

These EDCs are constituted so that:

The investment in forestry sector is enhanced as rural communities participate in forest protection and management. Rural communities are equal partners in the protection and management of forests. They control the management of forest lands and community lands by both members and non-members. They get a say in the objectives of management off their local forests. They are motivated to contribute their time, effort and knowledge via the mechanism of the EDC and their representatives in the Executive Committee to protect and

manage the forest. They derive direct benefits from sustainable use of the forest. They get a significant share in the returns from Eco-tourism as well as for reinvestment in the forest. To develop local leadership for bigger role in future. In this way the interests of local communities, forest departments and overall goal of forest management and conservation are served. Facilitators should have an open discussion with the local communities on these aspects, record any concerns and try and address them to the extent possible.

List of VSS / EDCs in Nagarjunasagar Srisailam Tiger Reserve (NSTR):

Sl. No.	Name of the Division	No. of EDCs	No. of VSS	Total
1	Project Tiger, Atmakur	17	31	**48**
2	Project Tiger, Markapur	44	62	**106**
3	Project Tiger, Nandyal	9	0	**9**
4	Project Tiger, Giddalur	0	26	**26**
	TOTAL:-	**70**	**119**	**189**

16.2.2 Coordination with Line Agencies / Departments:

Co-ordination of following agencies is required for management.

16.2.2.1 Revenue Department:

The revenue department takes care of keeping of land records of the people residing in the area. For rehabilitation of villages co-ordination with Revenue Department is most essential.

The Collector is Chairman of committee at District Level for the rehabilitation process. Various government agencies like R&B, Irrigation, Land records, Z.P. Health, Education and Tribal development etc., are required for rehabilitation process and the coordination of this department can only be obtained through the Collector. After the settlement of cases under Tribal Rights Acts, the demarcation and settlement is to be done in coordination with revenue authorities and in case the claims are rejected, the eviction is to be done forthwith.

16.2.2.2 Zilla Parishad:

Zilla Parishad plays an important role in development of villages. Various activities like public health, minor irrigation, village roads, and animal husbandry are taken up by Zilla Parishad. Other activities like sericulture, water harvesting structure, soil and moisture conservation works etc. are implemented by Zilla Parishad.

16.2.2.3 Police Department:

Forest and conservation of wildlife is an important task. Interstate poachers and also local poachers are involved in poaching and their activity is day by day increasing. To control this, cooperation of Police Department is amust. Joint patrolling with Police Department is necessary. This issue has also been discussed in the Divisional Tiger cell committee and District Level Tiger Cell committee and accordingly the programme is finalized.

16.2.2.4 Co-Ordination with Telangana Forest Department:

For the interstate poaching in Telangana and Andhra Pradesh senior officers from Telangana and Andhra Pradesh should meet in 3 months to discuss the issue of interstate poaching, illegal fishing in the Krishna River. At present, these meetings are not regular. However, increased coordination with Telangana Forest Dept. will be useful both for Telangana as well as for Andhra Pradesh, in view of large porous border with Telangana.

16.2.2.5 Animal Husbandry Department:

The co-ordination 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.

16.3. Fund Raising Strategies

Funds for the management will be raised as per the guidelines of Tiger Conservation Fund (TCF). The money collected from Environmental Maintenance Charges (EMC) Check Posts & Community Based Eco-tourisms will be used for development activities.

As per the provisions under the Tiger Conservation Foundation (TCF), the Field Director can accept donations (in cash and kind), funds under Corporate Social Responsibility (CSR) etc. It is proposed to have a team to tap CSR funds for the betterment of the Tiger Reserve. All funds collected under the Tiger Conservation Foundation (TCF) are used for maintenance, development and running of the Tiger Reserve.

16.4. SCHEDULE OF OPERATIONS

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Fire line creation	✓											✓
Fire line Maintenance	✓											✓
View Line creation	✓											✓
View line maintenance	✓											✓
Weed removal	✓	✓										✓
Grassland development									✓	✓	✓	✓
Road formation & maintenance	✓	✓	✓									
Filling of Saucer Pits	✓	✓	✓	✓	✓							
SMC Works	✓	✓	✓							✓	✓	✓
Development & Maint., of Water bodies	✓	✓	✓							✓	✓	✓
Camera trapping	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Concurrent monitoring	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Anti poaching & Anti snare drive	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MSTrIPES	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Phase-IV Monitoring	✓	✓	✓	✓								

16.5. ACTIVITY BUDGET:

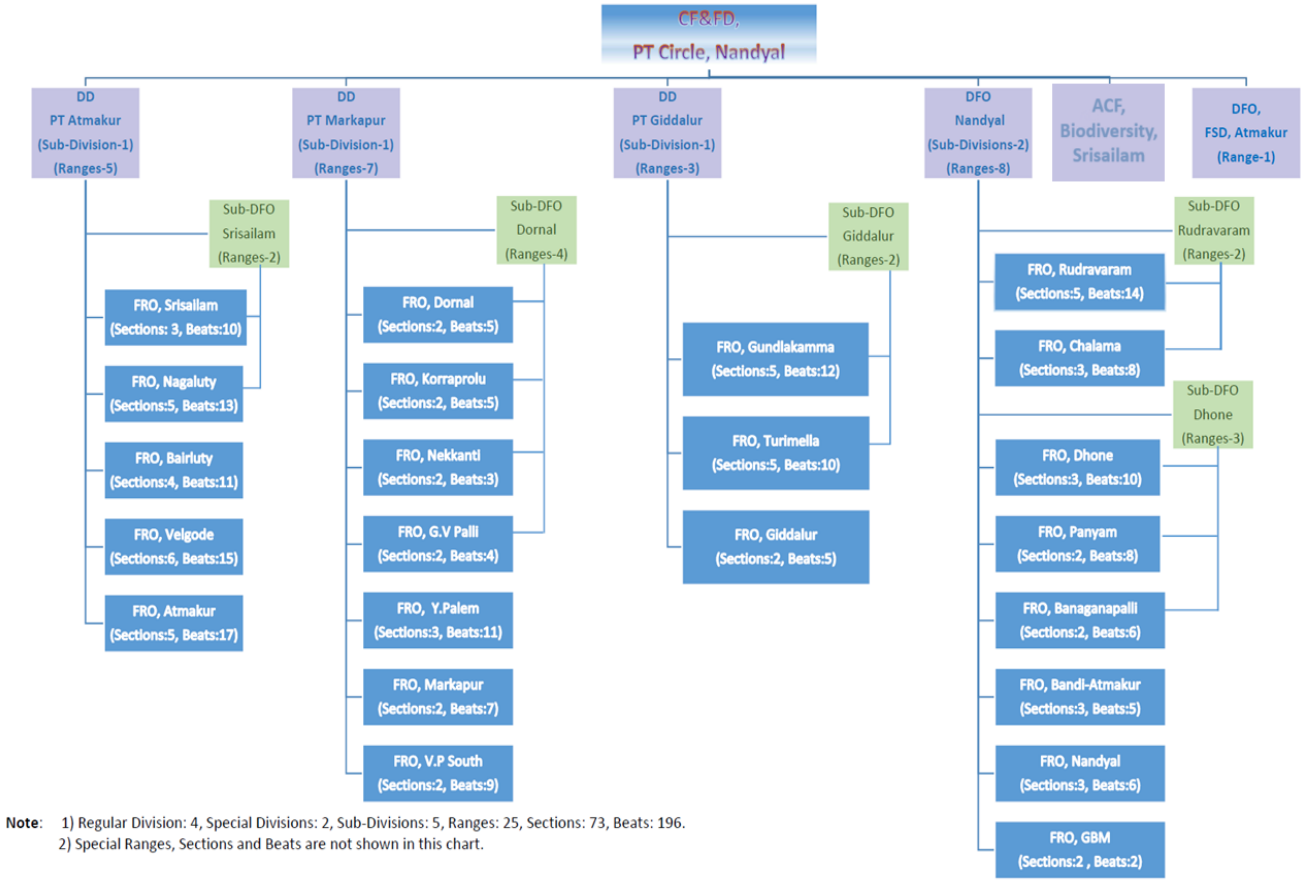
Information pertaining to Activity Budget is enclosed as **Annexure XXXII in Volume IV**.

16.6. 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' (PTC). Project Tiger Circle includes buffer area also. 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.

Four Deputy Directors holding charge of the Wildlife divisions *viz*., Atmakur, Markapur, Nandyal and Giddalur. The Divisional Forest Officer, Flying Squad Division, Atmakur and Assistant Conservator of Forests, Biodiversity, Srisailam and their staff assist the Conservator of Forests & Field Director in its management of the Project Tiger Circle, Nandyal (NSTR). The administrative office of the Conservator of Forests & Field Director is located at Nandyal (Field Head Quarters in Srisailam) and the offices of the Deputy Directors are situated at Atmakur, Markapur, Nandyal and Giddaluru.

16.6.1 Organogram of Nagarjunasagar Srisailam Tiger Reserve (NSTR):-



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.