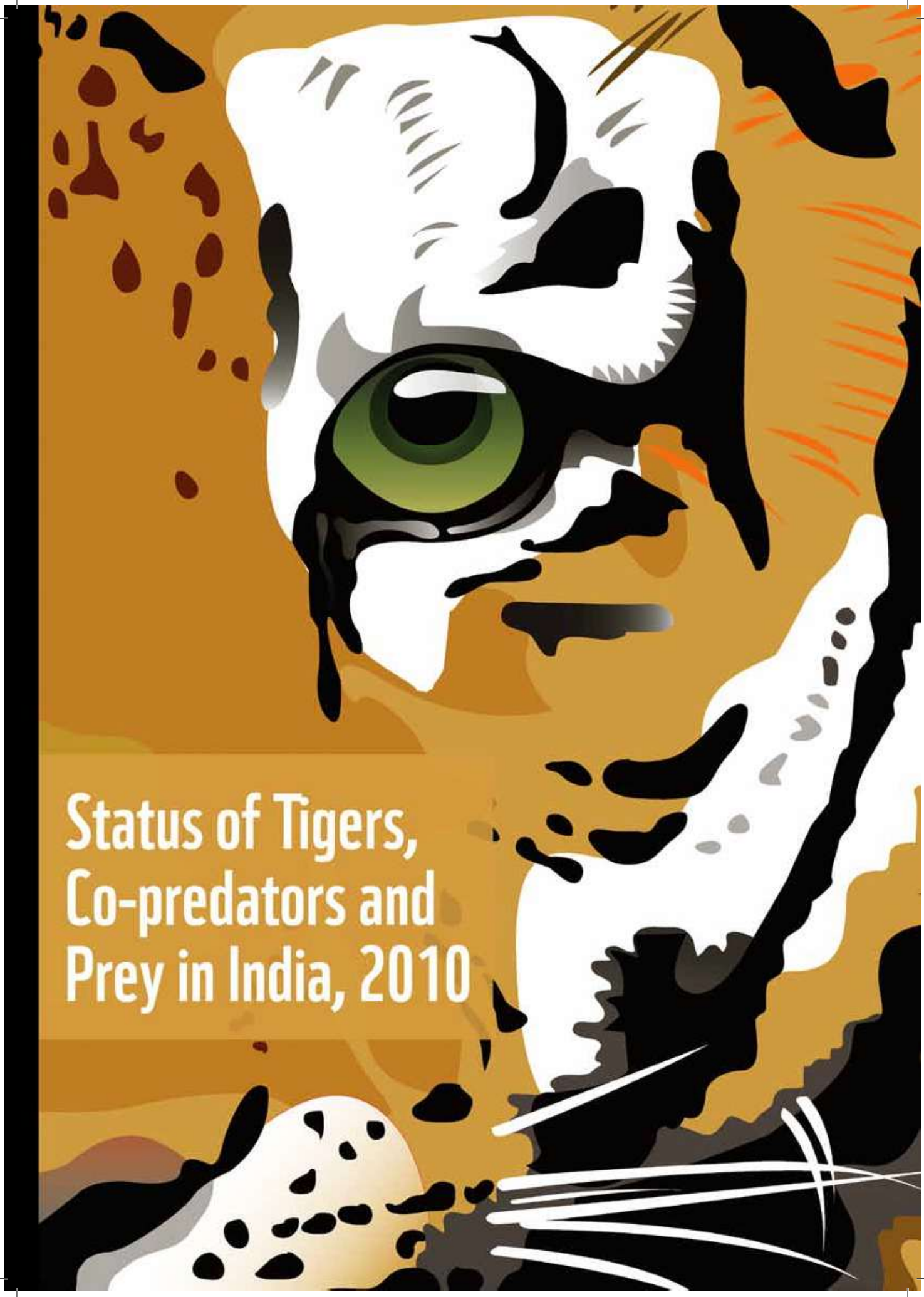

Status of Tigers,
Co-predators and
Prey in India, 2010



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ANDHRA PRADESH

The State of Andhra Pradesh has 22 Wildlife Sanctuaries and four National Parks along with 58 Forest Divisions. Nagarjunasagar-Srisailam is the only Tiger Reserve in the State but covers an extensive area of 3568 km² spanning across the districts of Mahbubnagar, Nalgonda, Kurnool, Guntur and Prakasam.

A larger part of the Tiger Reserve is located in Achampet tehsil of Mahbubnagar district. Most of the Reserve is drained by the River Krishna which flows for over 130 kilometers through the park. The reservoirs of Srisailam and Nagarjunasagar are also located in this area and inundated large portions of it when constructed. Around 200 villages are located around the Tiger Reserve, with 120 within the Wildlife Sanctuary and 24 within the core zone. Two highways, viz. 140 kilometers of the Mannanur to Dornal in Prakasam and another covering almost 50 kilometers of the Tiger Reserve from Nallaguntala to Bairlutty traverse the Reserve. Only 76 km² of the Tiger Reserve has very dense forest while 1174 km² has open forest. NTFP collection, forest fires, livestock grazing and presence of leftist extremist are major problems in this area.

South of Nagarjunasagar-Srisailam is the Gundla Brahmeswaram Wildlife Sanctuary in the Nallamalai tracts of Kurnool district which also has sporadic tiger presence. Further south are the Sri Lankamaleshwar Wildlife Sanctuary in Cuddapah district and Sri Penusila Narasimha Wildlife Sanctuary in Nellore which did not report any tiger signs in 2006 and 2010.

Most of the 63,821 km² forested area of the State is restricted to the northern parts in the Godavari Basin landscape. In the extreme north-west of the State are located Kawal and Pranahita Wildlife Sanctuaries (proposed to be made Tiger Reserve) in Adilabad district, contiguous with the forests of Maharashtra. This zone also has the Sivaram Wildlife Sanctuary in Adilabad district. However, the largest forested block in the north is located in Warangal and Khammam districts connected to forests of Chhattisgarh (Indravati Tiger Reserve). Etunagaram and Pakhal Wildlife Sanctuaries are in Warangal while Kinnerasani Wildlife Sanctuary occupies parts of Khammam district. South of Odisha along the course of the Godavari is located Papikonda Wildlife Sanctuary with forest connectivity into Odisha.

Four distinct populations in the Godavari Basin landscape and the Eastern Ghats complex in south-central part of the State were identified in 2006 (Jhala *et al.* 2008). These were tiger populations in (i) Adilabad district, (ii) Karimnagar, Warangal and Khammam, (iii) East Godavari and Vishakapatnam and (iv) Nagarjunasagar-Srisailam.

Northern Andhra Pradesh Landscape has lost substantially in terms of tiger occupancy and population between 2006 and 2010 (Fig. 2.AP.1). This trend of northern Andhra Pradesh does not bode well for the major source population within this landscape located at Indravati Tiger Reserve in Chhattisgarh. Due to Naxal insurgency Indravati could not be assessed, however the northern Andhra Pradesh tiger populations were indicative of the tiger status in Indravati. Major investments in protection, community participation and livelihood options are needed along with restoration of habitat corridor connectivity and prey populations to revive tiger populations in northern Andhra Pradesh.

Figure 2.AP.1

Tiger occupancy, population extent, size and habitat connectivity in Andhra Pradesh

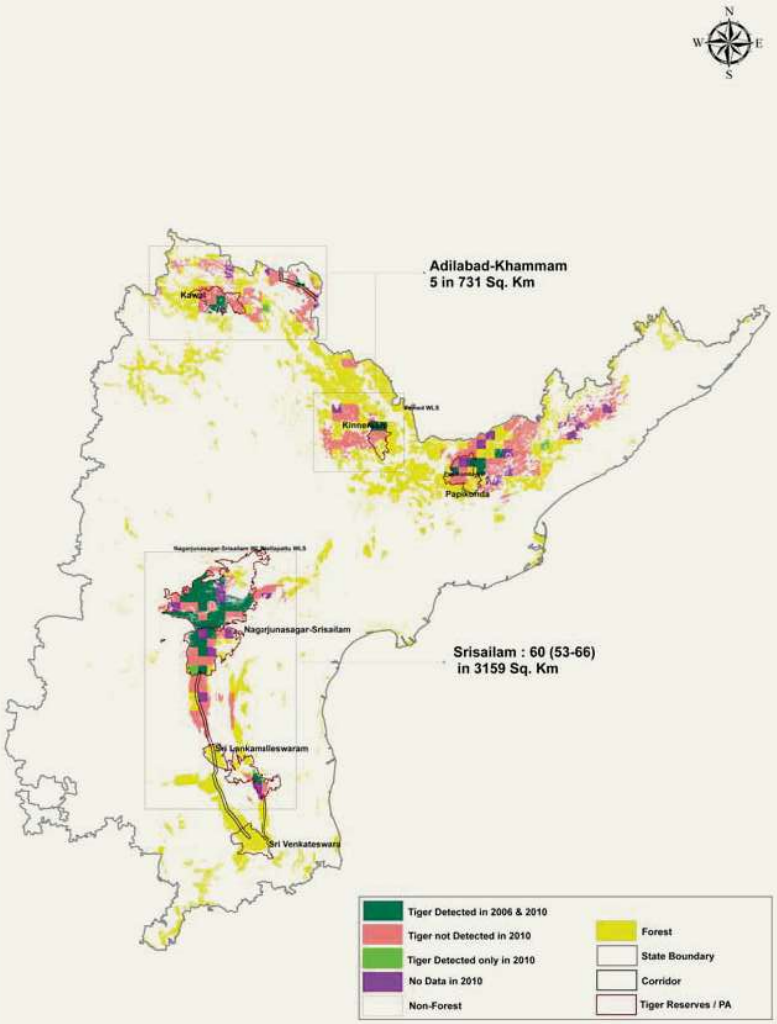


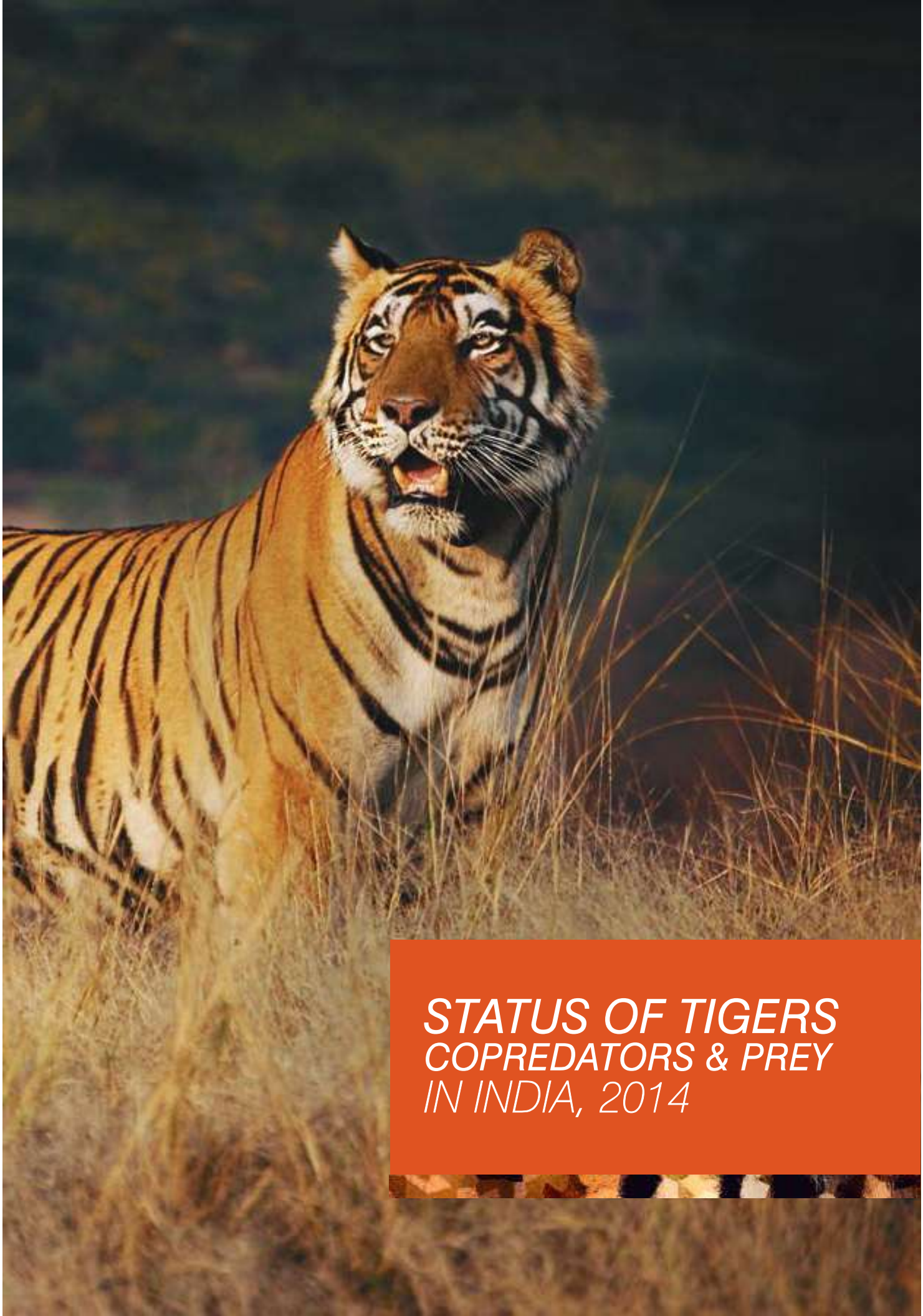
Figure 2.AP.1.1
Nagarjunsagar-Srilankamaleshwaram-Sri Venkateshwara corridor



Although Nagarjunasagar-Srisailam Tiger Reserve and its adjoining landscape recorded a drop in tiger occupied area, it showed an increase in tiger numbers. This is possibly due to a better assessment of tiger density by larger coverage in 2010. Control of extremism within Srisailam has assisted in its recovery, yet a lot needs to be done to control anthropogenic pressures especially livestock grazing by offering and subsidizing alternative livelihood options. Competition of wild prey with livestock and subsistence level poaching are major impediments to recovery of prey populations and subsequently those of tigers. Once Srisailam tiger populations increase and foster dispersing tigers, forest connectivity will ensure colonization and establishment of tiger populations in the southern Eastern Ghats landscape of Gundla Brahmeshwaram Wildlife Sanctuary, upto Sri Venkateshwara Wildlife Sanctuary (Fig.2.AP.1.1). A severe bottleneck exists within this connecting corridor near the township of Siddavatam where habitation, agriculture and roads disrupt this continuous forest connectivity for about 2 kilometer, but as yet, is not an insurmountable barrier to wildlife movement.

Tiger population status summary for the Central India landscape

State	Tiger Population			Tiger km²		
	2006	2010	Increase/ Decrease/ Stable	2006	2010	Increase/ Decrease/ Stable
Andhra Pradesh	95	72	Decrease	14126	4495	Decrease
Chhattisgarh	26	26	Stable	3609	3514	Stable
Madhya Pradesh	300	257	Decrease	15614	13833	Decrease
Maharashtra	103	168	Increase	4273	11960	Increase
Odisha	45	32	Decrease	9144	3398	Decrease
Rajasthan	32	36	Increase	356	637	Increase
Jharkhand	-	10	-	1488	1180	Decrease
Central India	601	601	Stable	48610	39017	Decrease



STATUS OF TIGERS
COPREDATORS & PREY
IN INDIA, 2014



Nagarjunasagar Srisailam Tiger Reserve (Andhra Pradesh)

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[1]Wildlife Institute of India, [2]Nagarjunsagar Srisailam Tiger Reserve

Nagarjunasagar Srisailam Tiger Reserve (NSTR) is the largest Tiger Reserve in India, which lies in the Eastern Ghats of Andhra Pradesh. NSTR spreads over an area of 5938.09 km², which includes an area of 1194 km² of Gundla Brahmeswaram Wildlife sanctuary (GBM) that is notified as an extended core to NSTR. The reserve spreads in the Deccan plateau, lies in between latitudes 15°45' N - 16°45' N and longitudes 78°15' E - 79°45' E. The altitude of the park varies from 200m to 900m. Major portion of rainfall is received from the southwest monsoon, which generally sets in the second half of June and till the upto first week of October.

Here, the southern dry mixed deciduous forest overlaps with teak bearing forest. Tectona grandis and Terminalia tomentosa are common throughout. Boswellia serata and Hardwickia binnata are found at dry hilly places. Wild herbivores found are, chital, sambar, barking deer, mouse deer, nilgai, chowsingha and wild pig. Among the large carnivores, tiger, leopard, wild dog, hyaena, and sloth bear are present.

There are 24 villages situated in the core area of NSTR. There are two tribal communities in the park, the Chenchus and Lambadas, who along with their livestock, are dependent on the park resources.

Sampling Details

a) Camera trap field surveys were carried out in NSTR in 2 blocks from December 2013 to July 2014. A total of 225 camera trap stations were setup, with a grid size of 1 km². Camera trapping sessions were also carried out in G.V. Palli and GBM from May 2013 to July 2014 (Fig. 9.34), and sampled over 48 occasions (Table 9.56).

b) Line transect surveys were carried out from March to July 2014, where 107 spatial transects were walked with an overall effort of 226.57 km during morning hours from 0600 to 0800 hour (Fig. 9.34) The number of observations for prey was too low to carry out analysis, hence only encounter rate has been provided (Table 9.57).

Varibles	Estimates (SE)
Minimum bounding polygon (km²)	1233.64
Camera Points	225
Trap Nights (effort)	20777
Unique tigers captured	29
Model	g0(.) σ(.)
D̂ ML SECR (SE) per 100 km²	0.85 (0.16)
Sigma (SE) (km)	7.66 (0.34)
g0 (SE)	0.005 (0.0006)

Table 9.56: Sampling details and parameter estimates of tiger from camera trap based capture mark-recapture analysis in NSTR, 2014.

SE: Standard error

D̂ ML SECR: Density estimate from Maximum Likelihood based spatially explicit capture recapture

σ(Sigma): Spatial scale of detection function, g0: Magnitude (intercept) of detection function

Figure 9.34: Distribution of camera traps (n=449) and line transects (n=107) in Nagarjunsagar Srisailam Tiger Reserve, 2014.

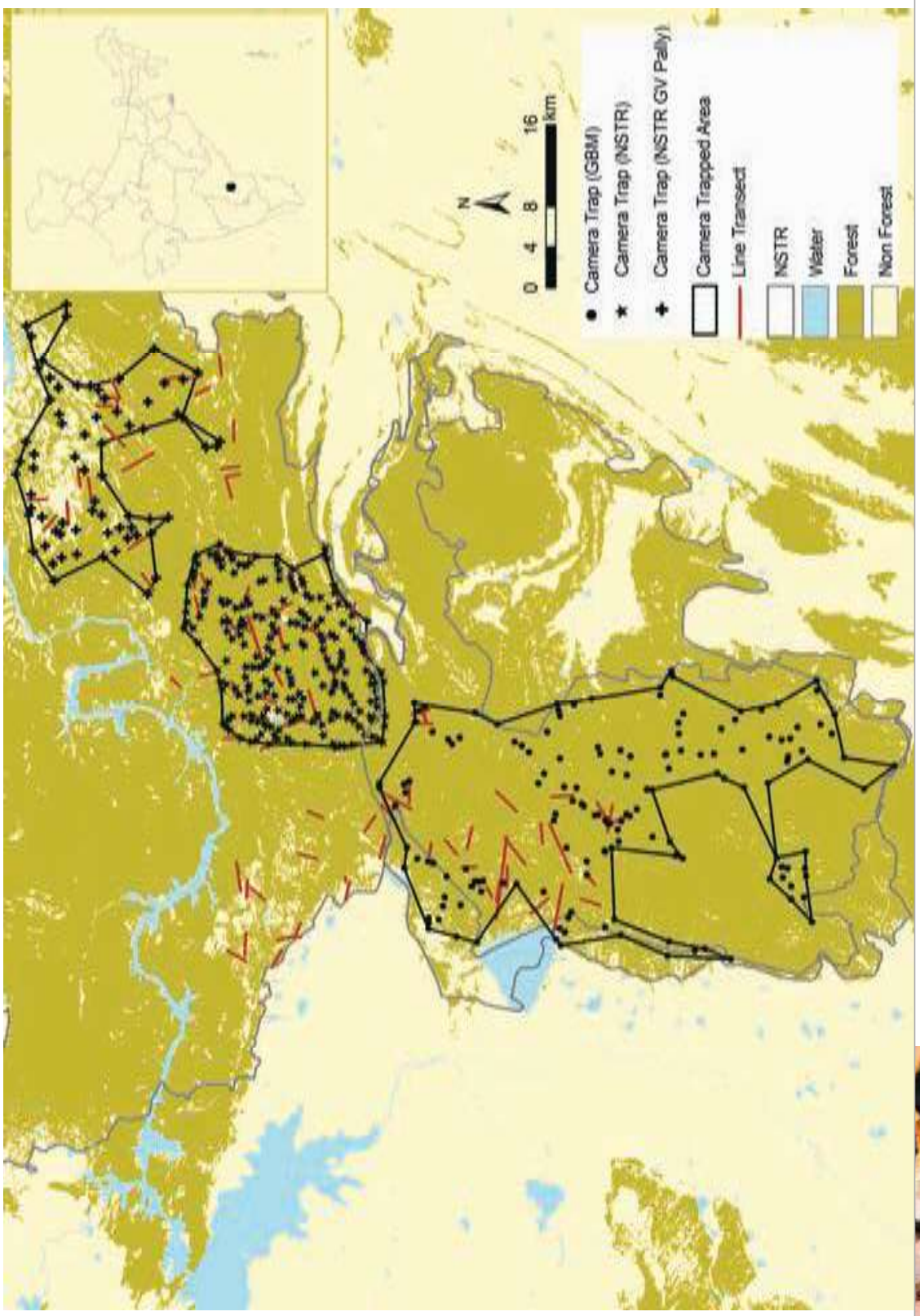




Table 9.57: Encounter rates of prey species seen on line transects (n=107, total effort of 226.57 km) in Nagarjunasagar Srisailam Tiger Reserve, 2014.

Species	No. of groups detected	Encounter Rate per Km
Chital	10	0.0441
Wildpig	9	0.039
Sambar	5	0.022
Four-horned antelope	3	0.013

Control of extremism within Srisailam has assisted in recovery of tigers. However a lot needs to be done to control anthropogenic pressure, especially livestock grazing which competes with wild prey, and subsistence level hunting, which are major impediments to the recovery of prey population and subsequently those of tigers in the reserve. Relocation of human settlements from the core area would help recovery of wildlife populations, including tigers.



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SUMMARY REPORT

STATUS OF TIGERS IN INDIA-2018

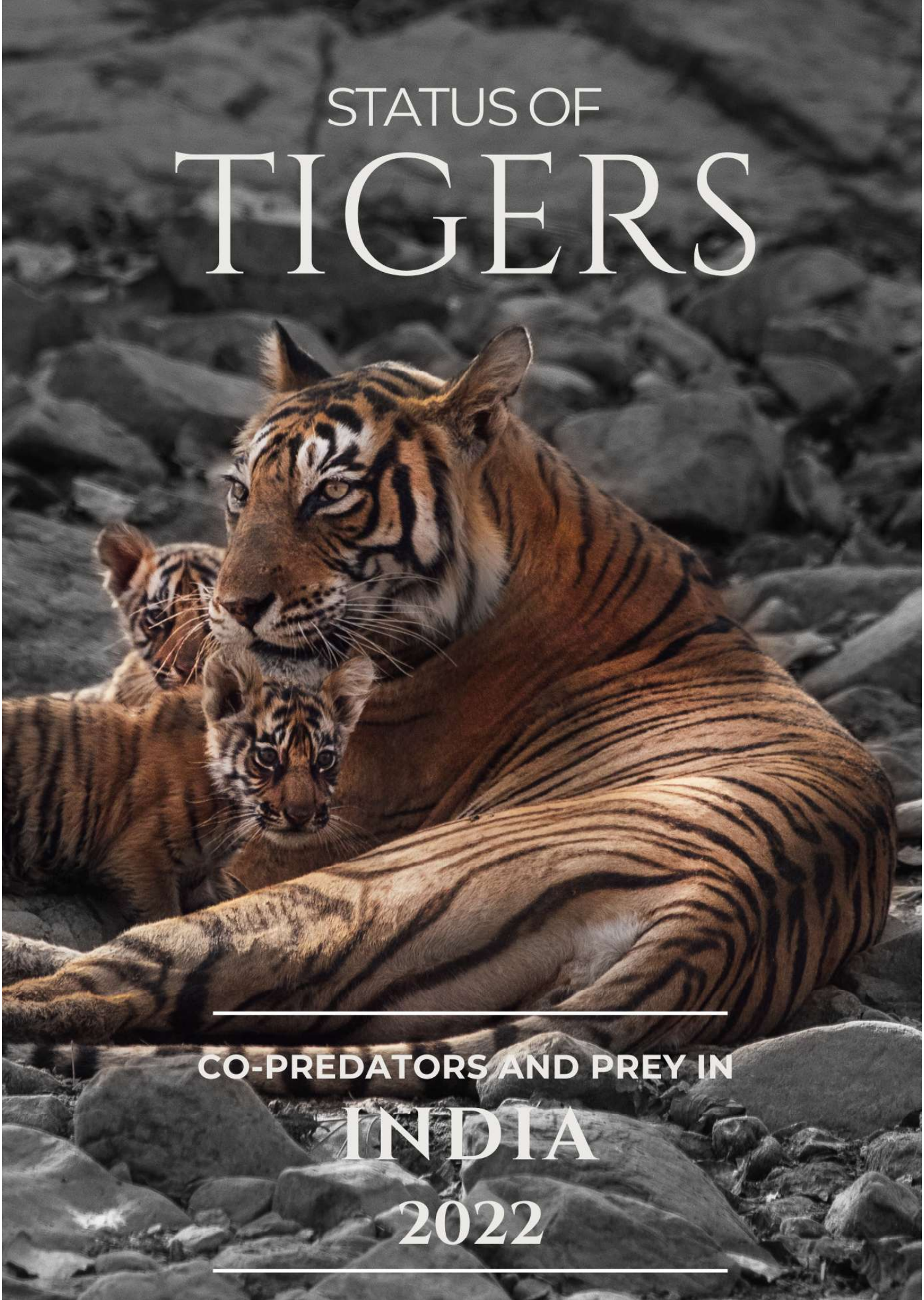
Table 1: Estimated tiger numbers (>1 year of age) in 2018 for landscapes and States compared with estimates for 2006, 2010 and 2014. Numbers in parenthesis are standard error limits.

State	Tiger Population			
	2006	2010	2014	2018
Shivalik Hills and Gangetic Plains Landscape				
Bihar	10 (7-13)	8	28(25-31)	31 (26 - 37)
Uttarakhand	178 (161-195)	227 (199-256)	340 (299-381)	442 (393 - 491)
Uttar Pradesh	109 (91-127)	118 (113-124)	117 (103-131)	173 (148 - 198)
Shivalik-Gangetic	**297 (259-335)**	**353(320-388)**	**485 (427-543}**	**646 (567 - 726)**
Central Indian Landscape and Eastern Ghats				
Andhra Pradesh	95 (84-107)	72 (65-79)	68 (58-78)	48 (40 - 56)#
Telangana	-	-	-	26 (23 - 30)#
Chhattisgarh	26 (23-28}	26 (24-27)	46 (39-53}*	19 (18 - 21)
Jharkhand		10 (6-14)	3*	5
Madhya Pradesh	300 (236-364)	257 {213-301)	308 (264-352)*	526 (441 - 621)
Maharashtra	103 (76-131)	168 (155-183)	190 (163-217)*	312 (270 - 354)
Odisha	45 (37-53)	32 (20-44)	28 (24-32)*	28 (26 - 30)
Rajasthan	32 (30-35)	36 (35-37)	45 (39-51)	69 (62 - 76)
Central India & Eastern Ghats	**601 (486-718)**	**601 (518-685)**	**688 (596-780)**	**1,033 (885- 1,193)**
Western Ghats Landscape				
Goa	-	-	5*	3
Karnataka	290 (241-339)	300 (280-320)	406 (360-452)	524 (475 - 573)
Kerala	46 (39-53)	71 (67-75)	136 (119-150)	190 (166 - 215)
Tamil Nadu	76 (56-95)	163 053-173)	229 (201-253)	264 (227 - 302)
Western Ghats	**402 (336-487)**	**534 (500-568)**	**776 (685-861)**	**981 (871 - 1,093)**
North East Hills and Brahmaputra Plains Landscape				
Arunachal Pradesh	14 (12-18)		28*	29*
Assam	70 (60-80)	143 (113-173)	167 (150-184)	190 (165 - 215)
Mizoram	6 (4-8)	5	3*	0
Nagaland	-	-	-	0
Northern West Bengal	10 (8-12)	-	3*	0
North East Hills, and Brahmaputra	**100 (84-118)**	**148 (118-178)**	**201 (174-212)**	**219 (194 - 244)**
Sundarbans		70 (62-96)	76 (62-96)	88 (86-90)
TOTAL	**1,411 (1,165-1,657)**	**1,706 (1,507-1,896)**	**2,226 (1,945-2,491)**	**2,967 (2,603 - 3,346)**

**: Estimated through Scat DNA*

#: For comparison with previous estimates of Andhra Pradesh, combine Andhra Pradesh and Telangana population estimate of current year

Tigers were not recorded in Buxa, Dampa and Palamau tiger reserves. Reserves had poor tiger status in earlier assessments as well.



STATUS OF TIGERS

CO-PREDATORS AND PREY IN INDIA

2022

ANDHRA PRADESH

NAGARJUNASAGAR SRISAILAM TIGER RESERVE

Nagarjunsagar Srisailam Tiger Reserve is situated in the Nallamala Hills Ranges (an offshoot of the southern Eastern Ghats) in the state of Andhra Pradesh. The state government notified Gundla Brameswaram Sanctuary, with an area of 1194 km^2, as an extended core of Nagarjunsagar-Srisailam Tiger Reserve in 2012. The total area of the reserve, including the core and buffer, is 3296.31 km^2, and it is India's largest Tiger Reserve. The river Krishna traverses through this critical tiger habitat for a linear distance of 130 km and separate it with Amrabad tiger reserve of Telangana state.

Camera trapping was carried out in the entire tiger reserve landscape that also include nearby protected areas like Sri Lankamalleshwaram, Sri Penusila Narsimha, and Shri Venkateswara wildlife sanctuaries. An effort of 36600 trap nights were invested, and 2443 photos of tigers were obtained, from which 57 unique tigers (>1 year old) were identified. The tiger density was estimated at 0.77 (SE 0.10) tigers per 100 km^2 (Table V.2.1). The detection-corrected sex ratio is female-biased by 2.8 females per male. (Table V.2.1).

Figure V.2.1

Camera trap layout and spatial tiger density in Nagarjunsagar Srisailam Tiger Reserve, 2022

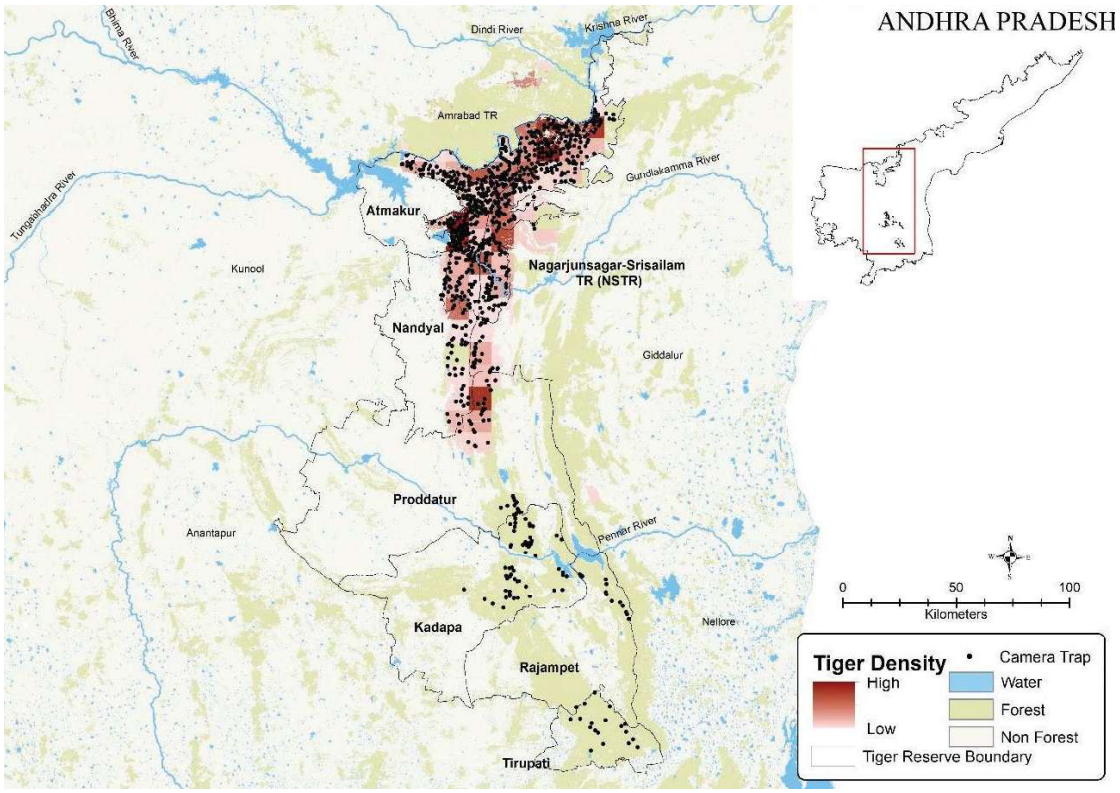


Table V.2.1

Sampling details and tiger density parameter estimates using spatially explicit capture recapture analysis in a likelihood framework for Nagarjunsagar Srisailam Tiger Reserve, 2022.

Variables	Estimate
Model space (km^2)	9456
Camera points	886
Trap nights (effort)	36600
Unique tigers captured	57
Model	$Pmix(sex)g_0(sex)\sigma(sex)$
$\hat{D}$ SECR (per 100 km^2)	0.77 (0.10)
σ Female (SE) (km)	2.89 (0.08)
σ Male (SE) (km)	5.18 (0.18)
g0 Female (SE)	0.03 (0.00)
g0 Male (SE)	0.02 (0.00)
Pmix Female (SE)	0.74 (0.06)
Pmix Male (SE)	0.26 (0.06)

SE: Standard error
$\hat{D}$ SECR: Density estimate from Maximum Likelihood based spatially explicit capture recapture
^σ (Sigma): Spatial scale of detection function,
^g_0: Magnitude (intercept) of detection function
Pmix: estimate of proportion of male /female (detection corrected sex ratio)

A substantial increase in the tiger population has been seen in the Nagarjunasagar -Srisailam Tiger Reserve since the last countrywide tiger estimation of 2018. Nagarjunasagar -Srisailam Tiger reserve (NSTR) is contiguous with the Amrabad tiger reserve of Telangana state forms the largest tiger population in the Eastern Ghat landscape. NSTR is connected to through Sri Lankamalleswaram, Sri Penusila wildlife sanctuaries which further connected with Sri Venkateswara National Park. No tigers were reported from the Sri Lankamalleswaram, Sri Penusila wildlife sanctuaries and Sri Venkateswara National Park.

PAPIKONDA NATIONAL PARK

Papikonda National Park is situated in the Papi Hills of the Alluri, Sitharama Raju, and Eluru districts of Andhra Pradesh. The park has an area of 1012.85 km^2 and spreads across the East and West Godavari districts of Andhra Pradesh and Khamman district in Telangana. The predominant and most extensive forest type found in the park is Southern Tropical Dry Deciduous type. The Polavaram irrigation project, once completed, will submerge parts of the national park.

An effort of 3792 trap-nights were invested and resulted into photo-captures of 1 adult tiger individual for the first time **(Table V.2.2)**.

Figure V.2.2

Camera trap layout and tiger presence in Papikonda National Park, 2022.

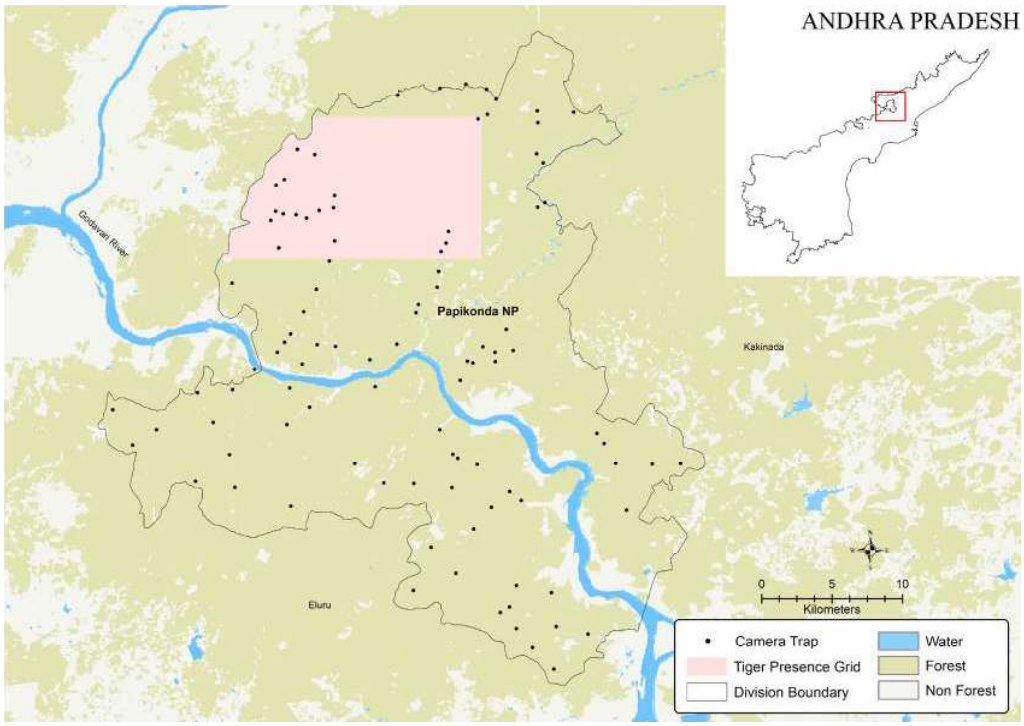


Table V.2.2

Sampling details of camera trapping exercise in Papikonda National Park, 2022.

Sampling Details	Counts
Camera points	103
Trap nights (effort)	3792
Number of tiger photos	6
Unique tigers captured	1

Papikonda National Park is connected with the Indravati Tiger Reserve and the nearby Kawal Tiger Landscape. An effective protection and prey recovery within this landscape can allow tiger recovery.