

BI-MONTHLY OUTREACH JOURNAL OF NATIONAL TIGER CONSERVATION AUTHORITY
GOVERNMENT OF INDIA

s t r i p e s

Volume 5 Issue 1

Nov-Dec 2013



LANDMARKS



STRATEGIES

EVALUATION



ACHIEVEMENTS

PERSPECTIVES



INITIATIVES

DETAILS OF TIGER MORTALITY, AS REPORTED BY STATES, DURING THE YEAR 2013 (AS ON 31.12.2013)

STATE	INSIDE TIGER RESERVE			TOTAL	OUTSIDE TIGER RESERVE			TOTAL	GRAND TOTAL
	Cases under scrutiny	Poaching Including seizure	Natural & Other causes		Cases under scrutiny	Poaching Including seizure	Natural & Other causes		
Assam	5	1	0	6	2	0	0	2	8
Karnataka	10	1	0	11	2	2	0	4	15
Kerala	0	0	0	0	4	1	1	6	6
MP	6	1	2	9	0	1	0	1	10
Maharashtra	0	3	0	3	4	1	3	8	11
Odisha	1	0	0	1	0	0	0	0	1
Tamil Nadu	0	0	0	0	1	0	1	2	2
Uttarakhand	1	0	0	1	7	1	0	8	9
UP	1	2	0	3	0	1	0	1	4
West Bengal	0	0	1	1	0	0	0	0	1
Rajasthan	1	0	0	1	0	0	0	0	1
TOTAL	25	8	3	36	20	7	5	32	68

Note: 18kg tiger bones were seized in Delhi (07.09.2013) by a team of Forest Department officials of Maharashtra, Wildlife Crime Control Bureau and Delhi Police

Photo: S P Yadav





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 Dr Rajesh Gopal

**EDITORIAL
 COORDINATOR**
 S P YADAV

**CONTENT
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BI-MONTHLY OUTREACH JOURNAL OF NATIONAL TIGER CONSERVATION AUTHORITY

GOVERNMENT OF INDIA

s t r i p e s

n o t e f r o m t h e e d i t o r



PANNA is an important tiger source area in the North Central Indian region of Madhya Pradesh. After facing local extinction of tiger due to targeted/non-targeted killings, the reserve has successfully fostered the reintroduced tigers.

The protection has been stepped up with 24X7 monitoring. Several important initiatives, including voluntary relocation of villages within the core have been rewarding. The peripheral areas of buffer urgently require active management to address resource dependency, while actively monitoring dispersing tigers to ensure their protection. This calls for close coordination with linking forest divisions within the State and in the adjoining State of Uttar Pradesh. A profile of this reserve highlights its attributes.

Valmiki is the only tiger reserve in Bihar which also makes border with the neighbouring tiger range country of Nepal. There are inherent corridor linkages with protected areas of Nepal and Uttar Pradesh. These require ongoing monitoring and protection.

Forest resource dependency in the southern portion of the reserve also requires an ongoing co-occurrence agenda to elicit local public support. An independent appraisal of this reserve by the NTCA has been presented.

Tiger conservation requires the active support of local people as they co-occur with the tiger. This calls for an 'inclusiveness' in management. Under Project Tiger, the States are supported to innovatively evolve a co-occurrence model to benefit tiger and people. Highlights of such initiatives in the Tadoba Tiger Reserve of Maharashtra are encouraging.

There are several best practices ongoing in tiger reserves. The e-learning institutionalized for tribal children in the residential school at the Anamalai Tiger Reserve is praiseworthy, which needs to be emulated by other reserves.

Dr Rajesh Gopal
 Member-Secretary, NTCA

Panna Tiger Reserve, Madhya Pradesh

R Sreenivasa Murthy, Field Director, Panna

Vikram Parihar

Panna Tiger Reserve is located in the Vindhya ranges that extend from south west to north east in the civil districts of Panna, Chhattarpur and Damoh.

Landscape of the PTR is characterized with 'Table Top' topography. Two plateaus run parallel to each other from south-west to north-easterly direction. The Ken river enters the TR from the southern end and passes through for 55km and exits the reserve at village Madla. Ken is the lifeline of the tiger reserve. This river is part of Ganga-Yamuna basin. Panna Tiger Reserve is the 22nd Tiger Reserve to be declared in 1994. Nestled in the northern most areas of Vindhya range of Central India, this is the only Tiger Reserve in the entire Bundhelkhand region. The total area of Panna Tiger Reserve is 576 (Core)+1002.42 (Buffer) sq.kms = 1578.56 sqkm. The tiger reserve is under the administrative control of the field director with his headquarters at Panna. The tiger reserve consists of the three conservation entities, namely, Panna National Park, Gangau WLS and Buffer.

CLIMATE

The climate in Panna is characterised by severe winters and very hot summers with mean annual rainfall of 1100mm, with 5-6 drought cycles in a decade.

HABITAT ATTRIBUTES: The park



with its north-central location in Madhya Pradesh forms part of the Indo-Malayan Realm floristically. Zoo-geographically, it is a member of the Oriental region and lies in Zone 6 E-'Deccan Peninsula — Central Highlands'. Plateau topography with underlying slopes, cliffs with talus and sehas offer excellent juxtaposition of outstanding habitats for the faunal components. Dhundua Seha offers one such glimpse and is known as 'Tiger and Vulture Heaven' by wildlife lovers.

The Ken river and savannah forests, along with mixed dense

forests on the slopes offer a variety of habitats which enhance the habitat value of the park, besides offering one of the best landscapes of dry deciduous tiger habitat of the country.

FLORAL ATTRIBUTES

The following forest types are met with in the National Park :

- Southern Tropical Dry Deciduous Dry Teak Forest
- Northern Tropical Dry Deciduous Mixed Forest
- Dry Deciduous Scrub Forest
- *Boswellia* Forest
- Dry Bamboo Brakes

■ *Anogeissus pendula* Forest

The plateaus are characterised with savannah forests with very thin vegetation and continuous grass cover where dry deciduous scrub forests are seen. The slopes are filled with dense forests of various types as described above. Bamboo associations are seen only on the slopes. *Anogeissus pendula* forest is an edaphic sub-type (on specific rock type i.e. conglomerate) which occurs mainly in a long strip of small width (0.5-1.0 km) in the foothills from Pipartola to Gangau dam on both banks of the Ken river. *Sterculia urens* (Kullu) is in abundance in PTR with good regeneration which otherwise is getting extinct from most parts of the State.

FAUNAL ATTRIBUTES

PTR is among the important Protected Area in the Central Indian Highlands complex, for its structural diversity and wide array of fauna, including 'the key species' Tiger. It is listed among the Regional Priority Tiger Conservation Landscape, which is defined as a low tiger density habitat with moderate-high levels of threats. PTR supports a sizeable population of Sloth Bear (*Melursus ursinus*), Leopard (*Panthera pardus*) and Striped Hyena (*Hyaena hyaena*). Other prominent carnivores are Jackal (*Canis aureus*), Wolf (*Canis lupus*), Wild Dog (*Cuon alpinus*), Jungle Cat (*Felis chaus*) and Rusty Spotted Cat (*Prionailurus rubiginosa*). The major ungulates that form prey for these carnivores are Sambar (*Cervus unicolor*), Chital (*Axis axis*), Nilgai (*Boselaphus tragocamelus*), Chinkara (*Gazella bennetti*), Four-Horned Antelope (*Tetracerus quadricornis*) and Wild Pig (*Sus scrofa*). The Common Langur (*Presbytis entellus*) is widespread, while Rhesus Macaque (*Macaca mullata*) is found only along the

forest peripheries closer to human habitations. There are over 150 birds species in PTR, and the important breeding birds include Marshall's Iora (*Aegithina nigrolutea*), White-bellied Minivet (*Pericrocotus erythropygus*) and Striated Grassbird (*Megalurus palustris*), besides a variety of Galliformes including Peafowl (*Pavo cristatus*), Painted Spurrow (*Galloperdix lunulata*) and Painted Francolin (*Francolinus pictus*). The area is known for its good vulture population which otherwise wiped out from most parts of the country. The rock cliffs with ledges provide good habitat for the rock nesting vultures. The park represents 7 out of 7 vultures of the region. Egyptian vulture, Long billed vulture, White backed vulture and Red headed vultures are resident vultures of the park and all four breed here. Eurasian and Himalayan griffon vultures and Cinereous vultures are the migratory vultures of the tiger reserve. The area also supports over 10 species of Reptiles, and over 50 species of fishes including two globally threatened Masheer species (Tortor, *Tor putitora*), popularly known as 'King of Freshwater Fishes of India'.

TIGER STATUS

PTR is known for its eventful conservation history over the last two decades. Panna has a controversial conservation history as it lost all its tigers in 2009 but immediately regained its status in 2012 when tigers were successfully translocated and reintroduced along with two orphaned cubs which were re-wilded. Panna Tiger Reintroduction Program has facilitated recovery of tigers and the glory of the reserve. The breeding of re-introduced tigers in the shortest possible time in Panna is an unparalleled success. At present the total tiger number at Panna is 23 (5 founder tigers and

18 adult/sub-adult/cubs). The Panna Tiger Reintroduction project, a collaborative venture of MPFD and WII, has just completed its Phase I and entered its II phase and is credited as one of the best 'Adaptive Active Management Practice Model' and has received an 'Award of Excellence' in the Active Management Category for the year 2012 from NTCA.

During the formative years of PTR, tiger density was less than 3 tigers/100 sqkm and appeared to have increased to 7 tigers/100 sqkm during early 2000. Tiger population in PTR was initially estimated based on pugmark technique which was followed by camera trapping method included by the NTCA-WII All Indian Tiger Monitoring Project in 2006. Based on the pattern, the tiger population in PTR showed a drastic decline. The results from these estimates indicated a mean population size of 25 tiger in PTR during 2006. Due to various reasons including poaching, the tiger population dwindled to almost none in 2009. In order to restore the prior status, tiger population was reinforced initially with two female tigers from Bandhavgarh and Kanha Tiger Reserves during March 2009. However, once it became clear that there was no resident male in PTR and the population was functionally extinct, a full-fledged reintroduction program was conceived and is being implemented with credible success (MPFD and WII 2009). The tiger reintroduction programme started in November 2009 but by April 2012 the reintroduced/re-wilded tigers met with an outstanding breeding success by producing 22 cubs in their five litters. By the end of 2013 the Tiger Reserve was filled with 11 adults (including 5 founder tigers) and 18 cubs to sub-adult tigers, totalling 23 tigers in a short span of four years.



Murthy

TIGER RESERVE LANDSCAPE DETAILS

Core: The critical Tiger Habitat/Core of the Panna Tiger Reserve, encompassing the whole area of Panna National Park and part of Gangau WLS, was declared in 2007. This is part of the larger Vindhyan landscape which is more than 5000 sqkm and comprises the forest districts of Satna, Panna, Chhattarpur, Damoh and Sagar. As on date Tiger Reserve part of Panna district is totally devoid of any human habitation and only three villages are left in the Chhattarpur district. In all 13 out of 16 villages have been relocated out of the CTH of Panna TR offering more inviolate space to tigers.

Buffer: An adjoining area of 1002 sqkm surrounding the core from three districts (Panna, Chhattarpur and Damoh) and four Forest Divisions (North and South Panna, Chhattarpur and

Damoh Forest Divisions) was declared as Buffer in 2012 with the area being transferred to the Tiger Reserve unit recently. As on date working plan prescriptions are getting implemented in these areas. TCP is under preparation. Once it is finalized and gets the required approvals, then the buffer will be managed as per the prescriptions of TCP. There are 49 villages in the buffer which require special package under the Eco-development programme to bring in the co-existence concept into action.

Corridor: The location of Panna TR in the entire Vindhyan landscape is critical. It is the only tiger source population that can connect the tiger population of the Aravallis and Vindhyan Ranges. A known tiger of Ranthambore was camera trapped in Datia forests in April 2012 proving this point beyond doubt. Within Madhya Pradesh, Panna TR reserve has corridor

connections with Bandhavgarh TR, Nauradehi WLS besides some meta populations of tigers at Chitrakoot forests of Satna district on the north-eastern end and Sagar district. Radio-collared tigers of Panna are moving in all directions and are establishing the corridor value of the entire landscape.

At present, there is a gap of around 30km between the Panna and Bandhavgarh TRs which needs to be filled in by afforestation on the banks of the water courses (rivers Ken and Midhassan). This will restore the corridor links of these two important and closest source populations for the long-term survival of both source populations and ensure gene flow.

MANAGERIAL ISSUES

■ Stabilizing the present gains of Panna Tiger Reintroduction Programme by establishing a viable source population in Panna landscape by 2019.

- Habitat restoration measures in the core to increase the prey base to support the increasing number of tigers.
- Creation of more inviolate spaces by relocating the rest of the three villages in CTH and other willing villages in Sanctuary and adjoining few villages.
- Assess the adjoining buffer areas for suitable tiger habitats and restore them.
- Restoring and establishing the connections between Panna and Bandhavgarh TRs on priority basis.
- Attending to the security aspects of Panna on continuous basis. Institutionalization of Security Cell concept to realize the Preventive Strategy on perpetuity.
- Integration of technological solutions to help security and management of PA.
- Opportunity to standardize the photo capture-recapture method tiger estimation with known number of tigers at Panna.
- Developing Panna TR as Tiger

- Learning and Capacity Building Centre.
- Reducing man-animal conflict.
 - Continuous consultation process with locals to gain their good will.
 - Continuation of Panna Nature Camps needs to bridge the gap with the locals.
 - Creation of ownership sense in the locals about the Tiger Reserve by offering them a special package with proper Eco-development interventions to realize the co-existence approach.

GOOD PRACTICES

- Successful Tiger Reintroduction/Re-wilding model in the shortest possible time.
- Best response of crisis management after local extinction of Tigers.
- Role model of Adaptive/Active Management of tiger conservation.
- Standardization of Tiger Reintroduction/Re-wilding practices/protocols, including Tranquillization, Transportation,

- Release, 24x7 radio telemetry monitoring etc.
- Best combination of 'Management and Science' at work.
 - Intelligence and Legal Cell
 - Panna Nature Camps and PPP
 - Annual Vulture Estimation
 - Phase IV

APPROACH & ACCESS

Approach wise Panna Tiger Reserve is one of the best positioned protected areas of the country. The nearest rail head and airport are located at Khajuraho which is just 25 kms from the nearest park entry point (Madla gate) a mere half-hour drive. Thus, this is a rare combination of a cultural tourist place of prominence (UNESCO recognized world heritage site) along with a wilderness area being almost together offering tourists a treat of both the worlds. Another positive aspect in this regard is Bandhavgarh Tiger Reserve is just a three-a-half-hour drive from Panna.

Ashwin Rai



Resource mobilization by Tadoba Andhari tiger reserve

N S Dungariyal

The Tadoba-Andhari Tiger Reserve in Maharashtra has been successful in supporting people in the fringe areas for eliciting their valuable reciprocal commitment for tiger conservation. A few initiatives taken by the Reserve management are as below:

■ Tiger Conservation

Foundation (TCF): As per NTCA's new rules, every tiger reserve has a TCF and gate money from tourism is deposited in it. Donations to save tigers are also accepted. The Tadoba TCF was set up on November 25, 2008, but after rules were notified it was activated in 2010.

■ Buffer Zone: Notifying buffer zones around tiger reserves is mandatory under the tiger conservation plan (TCP) after amendments in Wildlife (Protection) Act, 1972 in 2006. The Tadoba buffer zone was notified in 2010. It aims at protection of tigers and providing site specific habitat inputs for a viable population of tigers, co-predators and prey animals

■ Villages in buffer: There are 79 villages in Tadoba buffer zone spread over 1100 sq km area in Chandrapur and Brahmapuri

■ Villages with Eco-Development Committees(EDCs): Of the 79 villages, 66 have eco-development



committees that look after community development

■ EDC & its members: EDC is run by villagers with a forester as its secretary. Every EDC has a micro plan and grants are released according to plan and priorities

■ Money generated: The money from gate fee earlier used to be deposited with treasury but now goes to TCF. Tadoba Foundation generates over a crore every year

■ Money distributed: More than Rs1.5 crore has been distributed

to EDCs in the last three years since the TCF got activated

■ Villages getting money: Apart from TCF funds, other sources include CAMPA, 13th Finance Commission, SC/ST and tribal development heads. From TCF, priority is given to EDC villages. In 2011-12, Rs 26.52 lakh, Rs 26 lakh in 2012-13 and over Rs 1 crore in 2013-14 were distributed from the TCF.

■ TCF money in A/C: Funds are not distributed in cash but deposited in joint bank accounts of EDCs to ensure transparency and prevent misuse.

A unique way of learning

Tribal Residential School at Topslip, Anamalai Tiger Reserve, TN

The Tribal Residential School at Topslip under the control of Anamalai Tiger Reserve administration is functioning since 1959 to cater to the needs of children of tribals. The school was approved as a primary school in 1963. The school has upgraded to the level of middle school in 2005. The school has a strength of 89 (42 boys + 47 girls) from Class I to VIII.

Anamalai Tiger reserve has taken a new initiative to introduce e-learning in one of its tribal schools at Topslip, Pollachi, with the help of an NGO (Wild Wing Trust) and eVidyaloka.

In this collaborative programme, a digital class room facility has been set up in Topslip Tribal School with Skype connectivity and video conferencing facility. The children are being tutored in English, mathematics and science subjects. This had been initiated for a continued quality education for the Tribal Children of Anamalai Tiger Reserve.

The methodology through which maximum benefits are derived by tribal students from this programme are:

- Increase in the quality of education by engaging highly qualified teachers who are trained to handle children.
- Exposure to the external world through various means of activity-based classes and awareness sessions.
- Focused attention towards each child with a very healthy teacher-children ratio.

- Understanding and analysing the strength of each child and providing necessary counselling and direction for their career development.

- Get motivated to attend classes regularly.

The necessity for spearheading this education initiative in other possible tribal areas?

- To increase the quality of this basic need and building confidence among the parents to support conservation efforts by protected area managers.

- To arrest the dropout ratio which is very high after 8th Standard which makes them return to their settlement and makes them dependent on Forests for survival.

- Higher secondary and college dropout kids get involved and act as mediators in many illegal activities inside protected areas as they have the exposure to external world and knowledge of the natural resource available inside protected areas.

- Challenge for the administration to retain qualified teachers in the schools on a long term because of commutation issues.

Teachers involved in imparting e-learning

- **Hari Narayanan**, 25 yrs, PhD | Stockholm | **Maths**
- **Renganayaki N**, 55 yrs, | Neyveli | **Science**
- **Raamanujan S**, 24 yrs, PhD | Brussels | **Maths**

- **Gomathi N**, 50 yrs | Kalpakkam | **Science**

- **Kavitha A**, 30 yrs, B-Tech | Sydney | **Maths**

- **Keerthana**, 24 yrs, B-Tech | Palani (TN) | **Science**

- **Indu**, 24 yrs, B-Tech | Portland (USA) | **Science**

- **Krithika**, 24 yrs, B-Tech | Bangalore | **Maths**

- **Meena Hari**, 27 yrs | Bangalore | **Maths**

- **Kumaran V**, 24 yrs, B-Tech | Hyderabad | **Maths**

No. of children benefited so far | 42

Abstract of some feedback received from students, teachers and partners are —

From Children

Aspirational: “Want to become collector, police, teacher...”

Participative: “Able to retain what is taught”

Enthusiastic: “Would like to have more classes”

From Teachers

“Exciting”, “Challenging to cover basis”, “Will teach a class beneath Eiffel Tower”, “Deserving children, “Great model”

From eVidyaloka

- ❖ “Fantastic partnership”
- ❖ “Great teacher participation”,
- ❖ “Need to customize curriculum to be tribal children specific”.

An Appraisal: Valmiki Tiger Reserve

N S Dungariyal

The Valmiki Tiger Reserve (VTR) forms the eastern most limit of Shivalik-Gangetic flood plains in India, and also a part of the Terai-Arc landscape. The Reserve was constituted as the 18th Tiger Reserve in India by Project Tiger, Government of India in 1994.

The Reserve was earlier managed by the Bihar State Forest Developmental Corporation which was dissolved later on. The Reserve is in contiguity with Chitwan National Park and Parsa Wildlife Reserve in Nepal on the northern boundary. This landscape is part of the Valmiki-Chitwan-Parsa Tiger Conservation Unit (TCU), which has been classified as a Level-1 TCU. These trans-boundary forests covering more than 3500 sqkm of wilderness track have viability and potential for the long-term survival of tigers. The Reserve is located in the north-west corner of the state of Bihar in the district of West Champaran. This is the only tiger reserve in Bihar.

Valmiki Tiger reserve is under great impact for its resources of firewood from human populations living in two locations. One is an enclave and another one all along the southern boundary of the tiger reserve. A majority of the population, which exerts pressure in the form of cattle grazing, firewood and timber removal, come from SC/ST and OBC category. Most of them live below the poverty line and incidents of conflict between the management and sections of the population occur occasionally while protecting the resources.



Facts

- Total area of Tiger Reserve | 840 sqkm; 505 sqkm as buffer area (also known as Valmiki Wildlife Sanctuary) and 335.64 sqkm as core area (also known as Valmiki National Park)
- Vegetation: Moist-mixed deciduous forest, sub-mountainous semi-evergreen forest, dry sal forest, khair-sissoo forest, cane brakes, alluvial grasslands, wetlands and swamps.
- Fauna: Mammals - 53 species, Birds - 145 species, Reptiles - 26 species, Amphibia - 13 species (ZSI Report, 1998)

APPRAISAL METHODS

An NTCA team visited Valmiki Tiger Reserve from 17th December to 22nd December

2012 and followed different methods to understand the ground situation and accomplish the objectives.

- a. Interactions with Reserve management
- b. Field visit
- c. Questionnaires
- d. Scanning previous monitoring reports and review reports of Government of India

Thus, the Committee has brought out a report based on observations made through the above methods.

OBSERVATIONS

The Committee has observed that under the leadership of Field director the Reserve is doing well. The Field Director is motivated and has done extremely

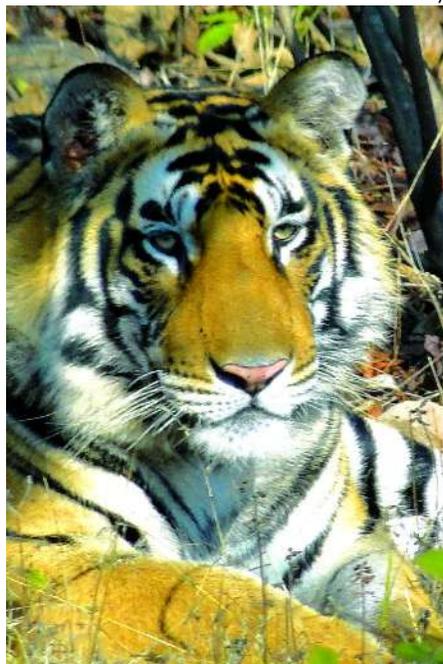
well during his short tenure so far. However, it will take time for the Reserve to regain its glory if whole or part of the anthropogenic pressure is eliminated. However, certain steps need to be initiated soon in the villages to go along with the administration for effective management of the Reserve. Protection and monitoring are well placed and a proper mechanism exists to evaluate and monitor the management system.

- Committee is satisfied with all initiatives taken by the authority and believes the Reserve is in the process of revival. The constructions of various buildings, amount and sanction orders are well inscribed with GPS readings such as wireless stations, anti-poaching camps, watch towers, buildings etc. The committee also felt the need for a park entry gate with proper ticketing system which does not exist at present.
- At present, the camera trapping process is under way by the WWF India. The management will install 114 camera traps in the entire reserve to come out with the population status.
- We observed that there is good coordination and dynamism between top forest officials and field level officers of the Tiger Reserve.
- The construction of boundary pillars along the boundary of the notified area needs appreciation.
- Patrolling work by the protection forces for the purpose of Wildlife monitoring in Gautela range needs worth mentioning. Information gathered during patrolling is recorded in a well-illustrated register. Furthermore, the data on the register is conveyed to the Division level.
- At present, the population of tiger and prey species could not be mentioned because of unavailability of information. However, the team is convinced that there

is a healthy tiger and herbivore population in the Reserve.

- Breeding of tigers has been reported recently by the field management and in one instance; one of the tiger cubs was killed and said to have been eaten by the mother for some unknown reason.
- There was report of wildlife mortalities in the last five years. Two tigers (one male and one female) were reportedly poached during 2006-2009. The committee suspects that opportunistic

Murthy



hunting does occur at certain localities although there exists a proper monitoring protocol.

- Advisories of NTCA / Project tiger issued for protection measures are followed up to a satisfactory level.
- Sasashtra Seema Bal (SSB) forces are deployed in the international border area. We noticed a well maintained register of wildlife sighting by the SSB jawans, which is necessary to know the movement of wild animals.
- The field inspections followed for monitoring and technical guidance by senior officers are well placed.
- Valmiki Tiger reserve, being

the only Tiger reserve in Bihar, receives greater attention from the highest level of the government.

- The Government of Bihar has issued one single government order for funds received in two installments from the Govt. of India with a rider that the funds meant for second installment could be spent after the receipt of the second installment funds from Government of India. This pioneer step will overcome the delay of 3 to 4 months for processing the second installment at the state government level to release the funds. This procedure could be followed in other states also.
- Funds are well placed before the field officers in time and during our visit, the authority received the second installment of the last APO sanctioned by the NTCA. Such timely receipt of fund is lacking in certain other Reserves.
- Coordination of the reserve management with line departments does exist.
- The Eco Development Committee has been formed but not functioning for want of required funds and other approved micro plans etc. which is being discussed separately.
- The committee was informed by the field director that "a website for Valmiki Tiger Reserve has been launched recently for publicity purposes and government initiatives taken by the forest department.
- The management of Valmiki tiger reserve has taken an initiative for promoting ecotourism after taking over infra structures from tourism department.
- Very few research activities are being taken up in the tiger reserves due to lack of awareness among research institutions in the universities in Bihar. At present research studies are being undertaken by Wildlife Institute of India, Dehradun and Indian

Institute of Science, Bangalore.

MONITORING OF PLAN SCHEMES

On perusal of the schemes sanctioned for five years, most of the components for which funds were released were for labour-oriented activities for which verification would be difficult now. However, works sanctioned in 2010-2011 and 2011-2012 which includes construction of buildings and development of infrastructure such as anti-poaching camps, check posts, deep freezer were inspected by the committee during our visits.

■ Water holes created in three places were inspected by the committee. Some of the water holes created in Division I are not well designed as shown below. These are steep and narrow and acting as a death trap for herbivores against predators to escape and young ones (Fawn, piglets, calf) which may slip down in water holes with no chance to come out. Therefore, it has been advised not to open such water holes in future and the present ones have to be improved by widening the water-holes all around for easy accessibility.

■ The Committee monitored work of removal of invasive weeds such as *Phoenix sp.*, *Michania sp. mikania*, *Eupatorium* & *Ipomea sp.* undertaken at different places in both divisions. The qualities of the work executed are satisfactory to good.

■ Construction of anti-poaching shed, check post, barrack and wireless rooms have been carried out at several places with funds drawn from NTCA. The qualities of the work executed are very good. Many of them are put in to use.

■ In order to consolidate the boundary of the tiger reserve action is being taken by the man-

agement to construct boundary pillars all along the boundary of the tiger reserve with funds released from NTCA. Some of the pillars erected on the boundary was inspected and found to be good.

■ The demonstration of grass development plot was launched on an experimental basis at two places after removing the tall elephantine and Typha grass. This experiment has to be watched for few more months to know the results.

■ The management has engaged huge labour force for patrolling, anti-poaching and tracking of animals.

■ Fire line work has also been

The tiger reserve employs 98 plot watchers, including ex-servicemen drawn from downtrodden communities and most backward communities, for patrolling during daytime and 90 trackers during dawn and dusk every day for tracking animal movement, especially that of the tiger

maintained by undertaking fire tracing work during the pre-summer season to prevent fire.

■ The wireless networks maintained under these funds are put in to use effectively.

The officials claim that apart from the above works, the funds sanctioned in the earlier years before 2007-08 to 2009-10 were generally for protection works such as engaging labour force for patrolling, anti-poaching, fire line

formation etc. Therefore this could not be verified by the committee. The Valmiki Tiger Reserve also receives funds from other schemes operated by state forest department for which specific permission was not obtained. However, the proposals are processed through Chief Wildlife Warden.

The qualities of work whatsoever inspected by the committee were really good. The tiger reserve employs 98 plot watchers including ex-service men drawn from downtrodden communities and most backward communities for patrolling tiger reserve during day time and 90 trackers employed during dawn and dusk every day for tracking the animal movement especially Tiger and other animals.

STATUS OF TIGER, CO-PREDATOR AND PREY

Tiger and leopards were earlier monitored and population estimation done using indirect signs such as pugmarks, scats calls, etc by the protection force. Since the earlier methods are unrealistic and unscientific, scientific methods of capture and recapture methods using Camera traps and DNA finger printing analysis of scat sample are being attempted by the management. Newly procured camera traps — 114 in all — will be installed to assess tiger density and its spatial distribution along with prey species. To accomplish the task of population estimation through camera trapping, a scientist from WII, Dehradun arrived during our visit. It has been suggested to FD, to go for scat analysis collected from different grid lines. The authority will have a clear picture about population status after completing the present assignment.

Sources of information on tiger

In 2010, NTCA reported 8 tigers in the Reserve, however,

authority mentioned that during that period no camera traps were installed in Madanpur range, and hence, the possibility of getting a true estimate of tiger numbers was limited. The management team along with the field staff suggested that the tiger reserve may support about 15 adult tigers at present. Proper population estimation alone will throw light about the actual status.

Field monitoring of tiger using device: The staff of protection and patrolling party monitors the movement of Tiger on daily basis using latest gadgets namely wireless network and cell phone services. And whenever animals are sighted or indirect evidences noticed, message sent to Range head office and Divisional office immediately. A monitoring Register has been maintained at every Range Office with detailed information on tiger sightings /evidences tiger presence and their locations. However geo-referenced data has not been entered in the register due to inadequate GPS sets and lack of training for application of this technology. A total of 114 new camera traps have been procured by the reserve management so far. A team of WWF-India headed by Dr. Jimmy Borah has already reached Bettiah to implement the camera-trapping protocol. Continuous monitoring would be required to determine the population, their territory, density of herbivores and their distributions and spatial occupancy in the Tiger Reserve.

Abundance of prey species

The abundance of prey base generally depends upon the availability of fodder and grass species in the tiger reserve. The density of herbivore population per 100 sq km depends on the abundance of availability of fodder especially nutritious C4 grass plants. The grass land patches

which are supposed to harbor abundance of prey species are not performing the same for the reason that this area is infested with impenetrable thickets of unpalatable, coarse tall grasses over 6 to 8 feet height. *Typha elephantine* and *Saccharum munja* are in abundance which hinders the growth of other grasses.

Consequently, the movement of herbivore population is restricted in such an area. In addition infestation of invasive species both exotic and native is a major threat that this tiger reserve will face in the long run. Among the invasive weeds, *Phoenix sp* has invaded large area followed by other species namely *Mikanea micrantha*, *Eupatorium sp* and *Lantana camara*, have spread in the descending order over an area of 15000 ha of forests due to their aggressiveness and spread by seed dispersal through various agencies. These species have occupied forest areas where there is high potential for increasing the prey base. The area of distribution of invasive species in the tiger reserve needs to be earmarked in a map and an action plan drawn to remove the two most destructive invasive species, namely *Phoenix sp* and *Mikanea sp* in a phased manner over 10 years.

At present the Field management lacks any system of monitoring prey abundance of the Reserve. This committee strongly recommended to carry out periodic herbivore population estimation using line transect method following distance sampling. The NTCA could provide the required technical support to implement the field methods for such an exercise which costs very little.

The committee members however sighted few individuals of following species of animals namely — Sambar, Chital, Nilgai, Hog deer and Rhesus macaque

Causes for low prey base density

The Valmiki Tiger Reserve was managed by the Forest Developmental Corporation till 1992. The following year, the Reserve was handed over to the state forest department. Grassland patches were planted with Teak (*Tectona grandis*) in many areas in order to generate revenue for the corporation without understanding the ecology of the grassland. In the process of conversion of grasslands, vacant sites were invaded by alien and native invasive species, thus reducing the space for native fodder species to grow. Realizing the potential value of the grassland, remedial measures have been undertaken recently by removing the weeds in certain places. However, the management has to go a long way to realize the goal of restoring all such grasslands to its pristine status.

PROTECTION OF THE RESERVE

The protection of the reserve is handled mainly by frontline staff namely forest guard and forester. However, due to a large number of vacancies in the total number of sanctioned strength they were unable to deliver. It is obvious that due to many vacancies, the jurisdiction of the forest guard for manning more than one beat will be larger than 2000 hectares of forest. It is very difficult to move and to protect natural resources within a time frame given the fact that the mean age of the protection staff is over 50 years.

On enquiry for filling up of vacant posts, it was reported that action is being taken at governmental level to form a selection committee to select forest personnel. Deficiency in protection from the field staff is compensated by engaging 14 patrolling parties consisting of home guard, ex-service men and local youth drawn from the weaker section of the society, to patrol the area to

protect the tiger reserve. Except two patrolling camps, other patrolling parties stay at night in remote forest areas. One of the remote anti-poaching sites was visited by the committee and enquired upon about the work of anti-poaching staff. While the patrolling party performs the duty during day time, the trackers are engaged to track the movement of tiger and other animals during dawn and dusk and report the animals/sighting to the management daily. Special patrolling is also done in monsoon season and festival season; additional vehicles are deployed for this purpose on hire during emergency period. Occasionally elephant patrolling has also been done with the help of two departmental elephants maintained inside the reserve.

The patrolling register is maintained by RO office and records the sighting of animal movement, indirect signs and anti-poaching activities. The register produced had information except the GPS reading for a place of sighting. The GPS reading could have given in case of sightings of animals and movement pattern of patrolling parties. The recordings made in the register and patrolling work is said to have been reviewed by District officers monthly. The protection staff, including the patrolling party who are not exposed to handle the electronic gadgets like GPS, range finders and communication equipment, need to be given training to handle the same after the procurement of such equipment and supply to the field staff.

The wireless and walky talky sets deployed for monitoring are put into best use. These were witnessed by the committee during the visit. The cell phones provided up to the level of forester provides an additional strength to protect the tiger reserves.

The Field Director, Valmiki

Tiger Reserve has made special efforts on his own in securing a sum of Rs 20 lakhs towards protection of wildlife from conservation trust run by Kothari Foundation in Mumbai. However, cattle grazing menace and fuel wood removal in the tiger reserve on the southern side of the forest bordering 152 villages (buffer zone) is a serious protection problem.

The field director and two DFO's are acting as one team galvanizing their whole energy towards conservation of the tiger reserve. Occasional incidence of conflict between the officials and the villages resulting in manhandling of the officer has also been witnessed while enforcing protection. Overall the security provided to the core zone of the tiger reserve seems to be good as per the observations of the committee during their brief visit. However, the security threat in the buffer zone forest fringe villages still remains a major concern to the management and to the Government. This calls for different approach all together to secure the forest. This requires personal attention from the Field Director and Chief Wildlife Warden, Bihar.

However, the prosecution status of pending forest and wildlife cases was unsatisfactory. At present, no successful prosecution has been made. It is not known whether the wildlife and forest cases have been taken on file for trial by the concerned judicial courts. Periodic monthly review by Field director and Chief Wildlife Warden may help in framing charge sheets and conducting trials successfully.

HABITAT IMPROVEMENT

The Valmiki tiger reserve management has been undertaking habitat improvement such as fire protection, cutting of fire lines, transect lines, improvement to existing waterholes, construction

of check dams and waterholes, providing salt lick for herbivores, management of grasslands and removal of invasive species. The monitoring committee visited some of the fire lines maintained and grassland developed and removal of invasive species. The committee members were really disturbed to see the vast areas of forest being invaded by both alien and native invasive species in the tiger reserve. According to the management, around 15,000 hectares of forest is under the occupation of invasive weeds causing serious degradation to the existing tiger reserve. Such invasive species will eventually eliminate the occurrence of native species in this area. Series of small water holes created in Division no.1 requires modification immediately so as to focus on proper management of water holes which would not in any way hamper the consumption of water by animals.

ADMINISTRATIVE/ECOLOGICAL PROBLEM AND MANAGERIAL ISSUES

Current administrative set up:

The Valmiki Tiger Reserve is headed by a Field Director in the rank of Conservator of Forests. The two Divisional Forest Officers are managing two divisions known as division 1 and division 2 comprising eight forest ranges. The Field Director headquarter is located at Bettiah along with the Division 1 headquarter. However, the Division 2 headquarter is located at Valmikinagar and Bettiah as well. The forest range offices are located close to the reserve boundary.

At present, 33 Forest guard and 7 positions of forester are lying vacant, which needs to be filled urgently. Apart from this, there are 100 trackers (daily wagers) and 110 patrolling party members (including ex-service men/Home guard) support the

department to carry out the protection mechanism. The mean age of the protected staff is over 50 years as in the case of most states in the country. The Principal Chief Conservator of Forests has informed during discussions at Patna that action is being taken to recruit them shortly.

INFRASTRUCTURE

At present, vehicles are available at forester level. The wireless network is also working very well. The network numbering 01 is operated at head quarter Bettiah, 08 at range office and at strategic beat levels. Apart from this, the vehicle of officers are also equipped with wireless sets. At present, the management has ordered 40 GPS units, 10 range finders, 2 binoculars and 3 night vision devices. The overall infrastructure available to manage the tiger reserve is adequate and could be effectively used for efficient delivery.

ECOLOGICAL CONCERNS

Grassland management: No grassland management was done in the Valmiki Tiger Reserve until recently. The ecosystem of the grassland was not understood by officials who were managing the grasslands for the purpose of raising timber plantation by Corporation. An extent of 44 sq.km of grasslands interspersed with the forest area is highly degraded and occupied by either invasive species or covered by impenetrable thickets of tall, coarse and unpalatable elephantine and typha grasses. The management has taken serious effort to remove the weeds from such grasslands and also the removal of coarse grasses on experimental basis. The well being of herbivores and its population revolves around the effective management of grasslands in Tiger reserve for which there shall not be a dearth of flow of funds from

NTCA/State Government.

Water scarcity: Although water is not the limiting factor in respect of IInd Division of the Tiger Reserve, the scarcity of water is being felt in summer days in some pockets of Division I of the Tiger Reserve.

Forest fire: Forest fires are occurring off and on in the reserve during summer season. Fire lines are being maintained by the management every year to prevent spreading of fire by undertaking fire tracking work on the boundaries of the forest. During the last 5 years forest fires occurred in 1319 sites covering an extent 6945 hectare. The extent of fire occurrence in the last 2 years is less compared to the previous years. But more intensive monitoring from the management is called for to reduce the fire incidence and the extent of area. However, there is no fire control action plan in place to prevent the occurrence of fire ie to identify the source of fire, anti-social elements involved, to procure firefighting equipment, to get information from the villages, to get support from the villages to extinguish the fire, to reduce the reaction time by mobilizing the resources in command to reach the spot to minimize the damage and finally taken action against the culprit. This type of plan is absolutely essential to prevent extensive damage from fire.

Biotic pressure: As mentioned earlier, the forest in the southern boundary of the tiger reserve abutting 152 villages with more than 2 lakh people and over 60000 cattle population bringing great pressure to the forest by way of felling of trees, collection of firewood, kendu leaves and cattle grazing causing degradation of forests. The demand on timber, firewood, fodder is so

acute for these people forcing them to enter into illegal activities as there is no alternative available to them at a cheaper cost.

Epidemic: Due to large number of livestock grazing in the Tiger reserve there is every possibility of wild animals contracting diseases due to human -herbivore-cattle interaction in the forest. To overcome this, and prevent spread of epidemic disease it is suggested to undertake ring-vaccination for all cattle maintained upto 5 kms from the boundary of the Tiger Reserve. It is also suggested to sterilize the water body located on the fringes of the boundary used by wild animals, humans and cattle to prevent water-borne diseases and parasitic infections.

ECO-DEVELOPMENTAL ACTIVITIES

Communication between Reserve management and tribals: There is hardly any meaningful communication between reserve management and tribals and local non-tribal people living outside the tiger reserve. Tiger reserve authority carry out a pure policing role with little or no participation of locals in management.

While the Tiger Reserve, endowed with rich biodiversity has no tribal or forest dwellers inside, the reserve faces serious threat from a large human population of 2,35,000 from 152 villages abutting the forests and grazing by over 60,000 heads of cattle. Influence of cattle grazing followed by removal of firewood, fodder and Kendu depletes the resources meant for sustenance of wildlife. Mere policing work in such an area may not improve the situation. Populations drawn from the weaker sections of society still live below the poverty line in that area. There are reports of conflict resulting in manhandling of officials by vil-



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lagers while discharging their official duty. Such incidences shall continue till a sustainable livelihood is secured.

The management hence, requires an entirely different approach with dedicated staff deployed with funds made available to implement eco development plan prepared in a holistic manner, with strong focus towards conservation of flora and fauna.

While ecodevelopment committees have been formed, they are not functioning due to lack of proper micro-planning and consequent non-availability of funds. The Director has assumed that micro-plans shall be prepared for each village which will help in identifying the resources available, constraints and recommendations for providing alternate livelihood options for the people besides implementing community development work.

There is no effort made to ensure convergence of all schemes implemented by different departments to the eco-devel-

opment committees till date.

The management can promote alternate sources of fuel like gobar gas and establish plants at the community/family/group level and provide milch cattle whose waste can be used to feed these plants.

Human-Wildlife conflict: This is regular happening in the tiger reserve with wild animals straying into private fields and damaging property and crops. The policy of the Government is to compensate the loss sustained by the victims outside forest area. At the same time, owners who lose their cattle due to lifting by tiger and other co-predators while grazing inside the tiger reserve are not compensated. Although the stand of the government is correct in the interest of conservation of tigers and co-predators legally, it is necessary to compensate the loss of cattle liberally so as to prevent poisoning of predators by people.

In addition the committee found that the compensation

amount approved by the Government is very low which does not meet the actual loss sustained by the farmer who does not have any other means of livelihood. For this, the compensation policy needs revision on par with the policy of other state governments.

Habitat Improvement

The Valmiki Tiger Reserve Management needs to concentrate on improvement of habitat on two aspects

- Priority should be given to remove invasive species namely *Phoenix humilis*, *Mikania micrantha*, *Eupatorium*, *Lantana camara* and *Ipomea* which have spread over 15000 hectares in a phased manner over 10 years utilizing the funds derived from the sale of teak timber stacked in timber depots at Madanpur and from other areas.

- Large water holes and water turfs should be created in such a way that animals have easy access to water from wider water holes and it should not become a

death trap for herbivores and their young ones.

Estimation of tiger and co-predator and their prey

It is critical for the management of the tiger reserve to assess the status of tiger and its density, co-predators and their prey species in the reserve. As of today the status of the tiger, co-predators and the prey base is not known. Therefore, population estimation through reliable methods of camera trap-photographic-capture-recapture method and genetic capture-recapture method through DNA finger printing from scat analysis systematically by laying out gridlines throughout the tiger reserve need to be done simultaneously, with involvement of some reputed Institutions and individual expertise from the field.

- The population estimation for prey species especially ungulates and primates should be done through distance sampling using line transect to provide density for whole tiger reserve.

- At the same time an exercise to know the number of cattle grazing inside the tiger reserve for each beat / range should be done to create a data base for managerial intervention through communities subsequently. Development of alternative livelihoods and alternative energy sources can then be achieved as data can be utilized to calculate biomass consumed by cattle and the potential waste generated.

Eliciting support of local people Establishing communication with tribal and local people:

It is desired that proper communication at all levels of staff including the managers is established with local communities who are exerting enormous biotic pressure on the tiger reserve. Maintaining transparency in implementation

of developmental projects is crucial to gain the confidence of villagers. To facilitate interaction with communities, committees may be constituted at Forest Range and Division levels involving people's representatives, intellectuals and NGOs. Public at large living in that area is generally unaware of the critical issues of the tiger reserve, so that finer aspects of Wildlife conservation and co-existence percolate down to every strata of society.

Eco-developmental activities:

Under the present scenario of biotic pressure, protection of tiger and its habitat cannot be ensured without actual participation and co-operation of the tribals and local villagers. The situation would improve with participation of villagers under Eco developmental activities such as monitoring of Wildlife, introduction of community development work and by creation of alternate livelihood activities, alternate energy development, income generation activities such as introduction of stall feeding etc. These measures would wean them away from forest-based dependency and elicit cooperation for protection and conservation of tiger and its habitat.

The management should have proactive policies in identifying unemployed educated youth, especially girls, and provide various capacity building training on vocational courses depending on the qualifications and attitude of the individual, so that they can get gainful employment either at home or outside. The management can even identify industries, institutions for training and gainful employment of deserving candidates from the unemployed educated youths.

Adequate funds of at least Rs 5 lakh for each EDC of this tiger reserve need to be released to provide basic amenities and alternative livelihood options

over the years.

The Tiger reserve management should establish cattle stall feeding for production of milk for the villagers who depend on the forest to generate income. In this process, the cow dung generated could be put to better use for gobar gas production as an alternative energy to firewood collected from the forest illegally. This would help in elimination of biotic pressure of cattle grazing and collection of firewood at one stroke.

The committee strongly recommends conveyance of schemes from other departments by pursuing with district authorities to ensure flow of funds on a regular basis.

Establishment of Tiger Conservation Foundation:

Although orders have been issued officially for the formation of a tiger conservation foundation, it's not functioning as per the guidelines of Government of India. The formation of Trust under the Tiger Conservation Foundation to receive funds from all sources including generation of income from the Tiger Reserves such as gate collection, tourism money, fines, forfeiture etc. is yet to take off for want of specific orders from Bihar government. The formation and efficient functioning of the Tiger Conservation Foundation is essential for managing the tiger reserve by ploughing back funds received towards conservation.

Strengthening protection

- All the front line staff vacancies should be filled up with young motivated youth from tribal and local villages by a special recruitment drive in order to replace the old guards.

- Wildlife monitoring system by patrolling with front line staff and local people using GPS should be followed throughout the reserve and reviewed on



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weekly/fortnightly/monthly basis by Range Forest Officers/ Divisional Forest Officers / Field Director respectively for efficient management.

- Wildlife and forest offences detected by the front line staff needs special attention at the level of Forester, Range forest officer (RFO) and Divisional officer for launching successful prosecution. Higher percentage of conviction against the accused would deter others from committing wildlife and forest crime. This requires periodical review and follow up action on the pendency of cases at the judicial court level.

- Intelligence network to gather information on all poaching and wildlife crimes needs to be developed with involvement of villagers/tribal community/front-line staff/NGO etc.

- This should be followed by rewarding the informant and

staff suitably.

- Mitigation measures for human-wildlife conflict: The compensation amount paid at present for human depredation, crop depredation and property depredation is comparatively low, for which the compensation policy for wildlife damage should be comprehensively reviewed by the State Government.

Compensation amount should be made realistic based on assessment of experts and village panchayats. The compensation amount also needs to be paid immediately for cattle lifting or crop damage through the Tiger Conservation Foundation without waiting for sanction of funds from the state government or Government of India.

Awareness amongst the people especially children and younger generation: The children and young generation often fall victim

to brain washing by vested interests due to unemployment and underemployment.

To achieve long-term conservation goals, it is important to undertake awareness programmes on wildlife conservation, preservation of biodiversity, importance of preservation of tiger and its habitats and activities of the reserve along with rules and regulations applicable to tiger reserves.

A separate office could be set up to implement such awareness programmes or the exercise can be dovetailed with eco-development activities by eco-development officers and their subordinate staff. A well-designed education and awareness programme could be developed by a reputed institution and implemented by the management with the help of eco-development committees and Forest Department.

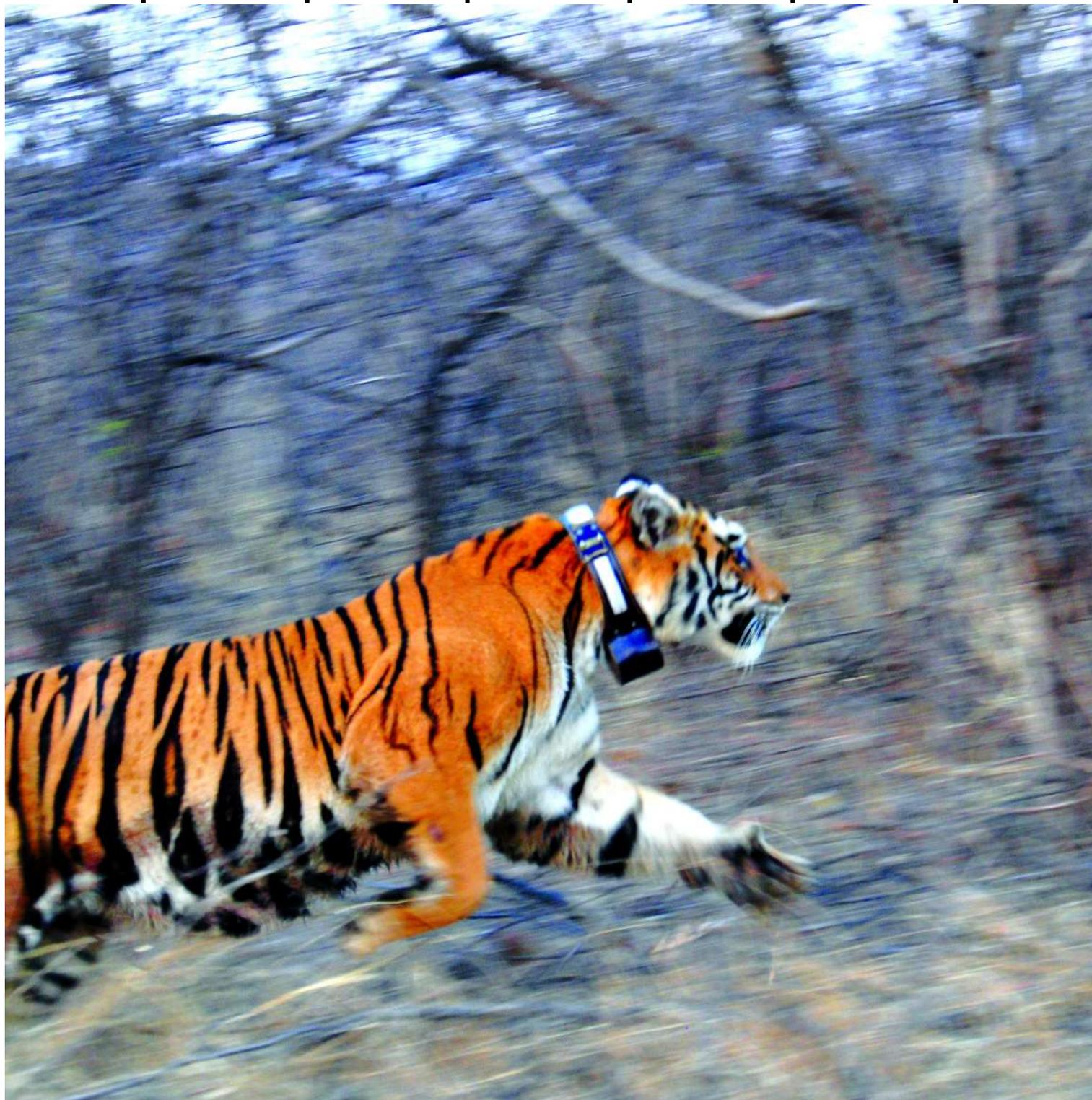
MONTH-WISE TIGER MORTALITY FOR THE YEAR 2013 (AS REPORTED BY STATES, AS ON 31.12.2013)

STATE	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Assam	1	2				1	1		1	1		1	8
Karnataka	2	4	4	1	2							2	15
Kerala		1	1		1		1		1		1		6
MP		2		1	3		1			1	2		10
Maharashtra	3		1	3		2		1		1			11
Odisha		1											1
Rajasthan			1										1
Tamil Nadu	1		1										2
UP	1										1	2	4
Uttarakhand		1	2	1	2	1				1		1	9
West Bengal			1										1
TOTAL	8	11	11	6	8	4	3	1	2	4	4	6	68

Note: 18kg tiger bones were seized in Delhi (07.09.2013) by a team of Forest Department officials of Maharashtra, Wildlife Crime Control Bureau and Delhi Police

Rupak De





Shubranjan Sen