

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

s t r i p e s

Volume 3 Issue 4

May-June 2012



LANDMARKS



STRATEGIES

EVALUATION



ACHIEVEMENTS

PERSPECTIVES



INITIATIVES

INTERNATIONAL CONFERENCE TO REVIEW IMPLEMENTATION OF GLOBAL TIGER RECOVERY PROGRAMME

EXCERPTS FROM THE MINISTER'S SPEECH

It is indeed a very pleasant task for me to inaugurate this First Stock Taking Meeting of senior officials and experts who are reviewing implementation of the Global Tiger Recovery Programme. India has been participating in the Global Tiger Initiative platform since its launch. The International Tiger Forum held in Russia during November 2010 culminated in the St Petersburg Declaration. A Global Tiger Recovery Programme (GTRP) was also adopted by the tiger range countries, with the national priorities being spelt out in their respective National Tiger Recovery Programmes (NTRP).

It is almost one and a half years since then and there is a need for stocktaking to know the progress relating to the implementation of NTRPs and the GTRP.

I am glad that the platform provided by the GTI is facilitating representatives from governments, donors, experts and conservationists to join hands for the important common cause of tiger conservation.

The status of wild tiger continues to remain endangered world over. As we all know, threats to wild tiger and its habitat are due to several factors like poaching, illegal trade catering to demand for body parts and derivatives of tiger, loss of habitat due to extractive industries, infrastructure and revenge killings. This list is not exhaustive. There are country-specific, area-specific issues which also affect tigers. Hence, the situation calls for adaptive as well as active management.

India's commitment for saving the tiger is well known. Wild tigers thrive in 17 of our states. We have the maximum number of tigers and their source areas.

Project Tiger has all long been a learning exercise. Our experience has highlighted the need for enlisting local public support, which is crucial for tiger conservation to succeed. The 'exclusive' tiger agenda of the core, complemented by the 'inclusive' multiple use strategy in the surrounding buffer areas have strengthened wild tiger conservation. Thus,

the 'people agenda' ranks prominently in our 'tiger agenda'. While we do not imagine any coexistence in the inviolate core areas, a viable inclusive agenda involving local people is fostered in the surrounding buffer.

Since last year, after taking over as the Minister for Environment and Forests, I have further sharpened the focus on tiger. The Centrally Sponsored Scheme of Project Tiger was revised in August, 2011. Its allotment was stepped up to Rs. 1216.86 crores, especially to support the States for securing inviolate space for tigers. Several additional components have also been included: (i) Change in the funding pattern in respect of North Eastern States (90:10), (ii) raising compensation for man-animal conflict to Rs 2 lakh, (iii) acquisition of private land for making the core/critical tiger habitat inviolate, (iv)

establishment of Tiger Safari, interpretation/ awareness centres under the existing component of 'co-existence agenda in buffer/fringe areas', and management of such centres through the respective Panchayati Raj Institutions, and (v) re-introduction of the cheetah.

Another important initiative is the 'M-STripES'. This consists of field based protocols for patrolling and ecological monitoring, complemented by a customized software for storage, retrieval, analysis and reporting. The Phase-IV tiger reserve level monitoring has also been launched recently. This would enable reserve level monitoring of tiger population, its prey and habitat on an annual basis.

We are faced with several challenges as well. We need to consolidate the inviolate space for tiger in core areas of tiger reserves, besides actively restoring the connecting habitats in tiger landscapes. The tiger concerns have to be factored in sectors where tiger conservation is not the goal.

I see this meeting as a great opportunity to learn from one another. Our experiences may vary but the goal is common. Your presence indicates the commitment for the cause which is praise worthy.

— May 15, 2012, New Delhi





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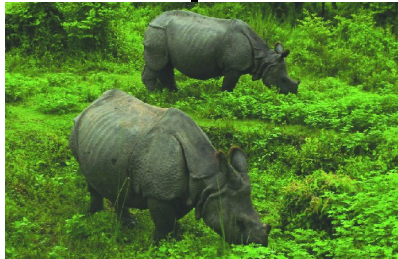
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BI-MONTHLY OUTREACH JOURNAL OF NATIONAL TIGER CONSERVATION AUTHORITY

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



THE Corbett landscape is well known and fabled for its tiger richness. The forest divisions surrounding the tiger reserve also have tiger source populations. The NTCA has provided a special grant to ensure day-to-day monitoring in the areas. This issue has a status report on the tiger and its prey along the southern boundary road of Corbett, which is subjected to considerable human pressure and man-tiger conflicts. The Ramnagar-Kalagarh-Kotdwar road is around 95km, of which 22km goes through the national park (core) while 25km passes through the buffer. The study indicates a high density of tiger and its prey in this area. Hence, upgrade of this road would be deleterious to tigers in the landscape.

An international meeting on the Global Tiger Recovery Programme Implementation was held in New Delhi during 15-17 May, 2012. This was attended by representatives from all tiger range countries apart from field officials, experts and NGOs. India

highlighted its country report which, inter alia, included policy and institutional arrangements, habitat management, controlling tiger poaching and illegal trade, transboundary collaboration, tiger-human conflict, capacity building, scientific monitoring, achievements and challenges.

Manas is one of the first nine tiger reserves in the country, and a world heritage site. This precious ecosystem is slowly reviving complemented by successful reintroduction of rhinos. However, the battle is far from won, given biotic and other pressures.

The Kawal Wildlife Sanctuary of Andhra is the latest addition to Project Tiger. It forms a crucial linkage with the Tadoba-Andhari Tiger Reserve of Maharashtra and Indravati of Chhattisgarh.

During the first week of May 2012, a country level meeting of Field Directors and Chief Wildlife Wardens of tiger States was held. The reserve-wise salient issues are highlighted.

Dr Rajesh Gopal
Member-Secretary, NTCA

STATUS REPORT

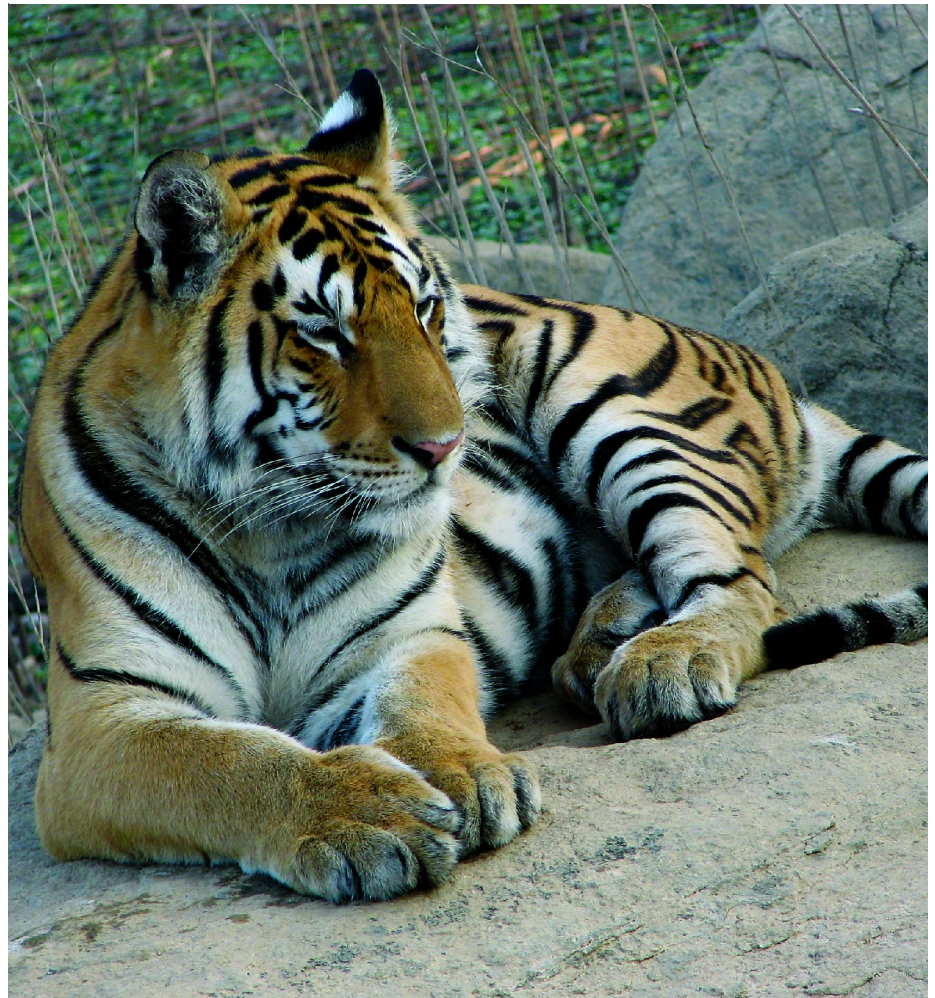
**Bivash Pandav & A Harihar,
Wildlife Institute of India, Dehradun**

N S Dungariyal

A stretch of 47 km of the 95 km Ramnagar-Kalagarh-Kotdwar road cuts through the southern region of Corbett Tiger Reserve. Part of this road (22 km) passes through the national park and the remaining 25 km stretch passes through the buffer zone of the tiger reserve. This stretch of 47 km road currently exists as a dirt road with minimal traffic. An upgrade plan of this road threatens to fragment and induce edge effects to this invaluable source site for tigers in Indian Terai Arc Landscape. To assess the current status of tiger and ungulate prey use of this road, we collated information and carried out additional field work in gap areas along the southern extent of Corbett Tiger Reserve.

We used the information generated from the All India Tiger Population Estimation Exercise to determine the extent of tiger use of the 22 km stretch of road, which passes through the National Park, between Kalagarh and Laldhang. We also gathered information from a study designed to look at tiger occupancy in Indian Terai Arc Landscape and determined the tiger occupancy of Corbett Tiger Reserve as well as the prey density along its southern extent. We carried out primary sampling (camera trapping) along the 25 km stretch of the road, which passes through the buffer zone of Corbett Tiger Reserve, during July-September 2011. During this period we also collated the information on traffic volume on this road as well as extent of human tiger conflict in the region.

Our results clearly indicate that Corbett Tiger Reserve is the most important high density



Corbett | Status of tiger & prey species along southern boundary road

tiger area in the entire landscape. Our surveys in the area clearly indicate high predator and prey use in the region along the 47 km forest road from Laldhang to Pakhro. Tiger and leopard signs are frequently encountered on this stretch of road as well as the forest surrounding the road. Seventy individual tigers were photographed within a 5 km buffer of the 47 km stretch of

forest road. Tiger density along this road varied from 14.59 (\pm 2.06)/100 sqkm in the 22 km stretch that passes through the National Park to 4.52 (\pm 1.17)/100 sqkm in the 25 km stretch that passes through the buffer zone of the tiger reserve. Results of our occupancy and camera trapping surveys clearly indicate high tiger use of the road as well as its adjoining area.

Besides tiger, the study also documented frequent use by elephant, prey species, namely spotted deer, barking deer, sambar and wild pig; leopard; small cats, namely rusty spotted, leopard and jungle; and other small carnivores, namely jackal, common palm civet, small Indian civet and grey mongoose both on the existing forest road as well as its adjoining areas.

Tiger captures on the road were considerably high in places with contiguous habitat on the southern part of the road connecting to Bijnor forest division of Uttar Pradesh. Any plan to upgrade this forest road will negatively affect the wildlife use of this area. Thoughtful planning keeping in mind the biological needs of threatened species such as tiger and elephant is required to realign the existing road outside the boundary of Corbett Tiger Reserve.

In relation to the entire landscape, our results indicate that CTR is the most important high density tiger area in the landscape. Our surveys in the area have indicated that both predator and prey use in the region along the road and adjoining forests from Dhela to Pakhro is high. Tiger signs were more frequently encountered (80%) in the forests surrounding the road than along the road (44%). However, in contrast, leopard signs were more frequently encountered along the road (87%) than in the surrounding forests (45%). Wild prey species (sambar, chital, nilgai and wild pig) and elephants are also encountered frequently in the region. In addition, wild prey densities estimated using standard distance based methodology indicates that the overall prey densities in the region along the road and adjoining forests from Dhela to Pakhro are high.

During a 328 day period from 8 October 2010 to 31 August

2011, a total of 4028 vehicles were recorded using the road. A majority of these vehicles were light motored vehicles (72.8%; 2933). Although the daily average (\pm SD) of LMVs was 8.94 (7.5) and HMVs was 3.33 (3.8), we recorded patterns in the weekly totals of vehicles plying on the road.

TIGER DENSITIES ALONG THE FORESTS SURROUNDING THE ROAD (DHELA TO KALAGARH)

Fifty-eight individual tigers were photographed on 103 occasions following an effort of 4,441 trap nights as part of the All India Tiger Population Estimation exercise in Corbett TR

Thoughtful planning keeping in mind the biological needs of threatened species such as tiger and elephant is required to realign the existing road outside the boundary of Corbett reserve. Our surveys indicate predator and prey use in the region along the road and adjoining forests from Dhela to Pakhro is high

during 2010-11. Tiger density was estimated through spatial capture-recapture method using the DENSITY (Efford 2009). Estimated density of tigers in the stretch of road between Dhela to Kalagarh was 14.59 (SD; 2.06).

TIGER DENSITIES ALONG THE FORESTS SURROUNDING THE ROAD (PAKHRO TO KALAGARH)

We photographed 12 tigers on 60 occasions (7 females, 3 males, 1 cub and 1 unclassifiable) fol-

lowing an effort of 1,423 trap nights (21 July to 16 Sep 2011) across the survey area. While a total of 12 individuals were photographed, only 9 adult tigers (6 females, 3 males) were confirmed unambiguously.

Of the 12 tigers captured during the sampling period, 7 were frequently photographed on the camera trap stations placed on / in close proximity to the 25 km road between Pakhro and Kalagarh. In total, 37 photographs of these 7 tigers were obtained from these trap stations.

For the analysis of population size, we only considered the 8 different adult tigers photographed during the period from 15th August to 15 September 2011. During this period, 43 captures of the 8 individuals were obtained. The results of the closure test supported the assumption that the sampled population within the selected 32 day period ($Z=1.25$, $P=0.89$) was closed. We employed spatial capture-recapture methods using the DENSITY (Efford 2009). The estimated density of tigers (D) in the sampled area was 4.52 (SD; 1.17)/100 sq km.

ASSESSMENT OF CONFLICT

We surveyed the nine gujjar settlements as well as the small village located at Neem Sot between Pakhro and Kalagarh to assess the level of conflict and attitude of forest dwellers.

During the period of our study (21 July-16 September 2011), we recorded three instances of conflict with tigers. Two livestock were killed during August in the Dhaulkhand and Judi sot areas and three were injured during the first week of September at Kilavali.

Although the 47 km stretch of Kotdwar-Ramnagar road runs along the southern boundary of Corbett Tiger Reserve, findings of this study clearly indicate that the tiger use of this entire

stretch is very high. Tiger density in the immediate vicinity of this road varies from 4.5/100 sq km in the buffer area between Pakhro-Kalagarh to 14.6/100 sq km in the core zone between Kalagarh and Laldhang. Results of this study clearly indicate that the existing forest road is being intensively used by tigers. The fact that nine out of ten camera traps placed on the road between Pakhro and Kalagarh resulted in multiple captures of tigers during the study period itself proves the high intensity of tiger use of the existing forest road. The sign survey data conducted in the winter of 2010-11 also corroborates this finding. Both the results of our occupancy and camera trapping surveys clearly indicate high tiger use of the road as well as its adjoining area.

The traffic volume on this dirt road is low at the moment with negligible amount during the monsoon. Extremely low level of disturbance due to minimum flow of traffic is actually facilitating the high tiger use of this area. Up gradation of this dirt road will certainly result in an increased year round flow of traffic and will alter the tiger use of this road as well as its adjoining area. During the course of this study, a tiger cub was found killed due to collision with a vehicle on the metalled stretch of this road near Dhela on the 30th July 2011. Considering the high intensity of tiger use of this area, as evident from this study, with the up gradation of the dirt road such possibility of road hits will certainly increase.

Across tiger's range, recent studies have documented the deleterious effects of roads on tiger populations (Kerley et al. 2002; Linkie et al. 2006). The construction of a road through high-quality tiger habitat in Russia was found to reduce a source population to a sink, that no longer provided supplementary



S P Yadav

tary tigers to neighbouring areas (Kerley et al. 2002), while in Sumatra, the presence of public roads were found to negatively influence abundances of tigers (Linkie et al. 2006). More recently, studies in southern India (Hosmat & Gubbi 2010) highlight the effect of primary roads on wildlife populations and suggest mitigatory measures to minimise the negative effects of road expansions in high quality tiger habitats.

Information on human tiger conflict was made available to us by the gujjars after lot of persuasion. Considerable amount of live stock depredation does take place in the buffer zone (between Kalagarh and Pakhro) and most of these conflicts go unreported. This is a matter of concern and needs to be addressed on a priority basis as repeated conflict may lead to poisoning of the carcasses there by leading to unnatural death of tigers. During our surveys, all the gujjars between Kalagarh and Pakhro showed keen interest in a voluntary relo-

cation program in the line of Rajaji National Park.

Lack of education for the children was the main reason cited by the gujjars to move out of the forest. Relocation of human settlements from the core area (Dhara, Jhirna and Kothi Rau) of Corbett Tiger Reserve has transformed the area in to the highest tiger density area across Asia.

The Sonanadi Wildlife Sanctuary in Corbett Tiger Reserve holds similar potential of harbouring very high tiger density like that of the core area provided gujjars are relocated from this area. Recovery of tiger population following the voluntary resettlement of gujjars has been well documented in the Chilla Range of Rajaji NP (Harihar et al. 2009). Photographic evidences of breeding tigers in this study highlights the importance of the area thereby necessitating consolidation of prime tiger habitat through voluntary resettlement of gujjars in Sonanadi WLS and other parts of Kalagarh Tiger Reserve Division to ensure long

term viability of tiger population in Rajaji-Corbett complex.

Besides tiger, the study also documented frequent use of elephant, prey species (spotted deer, barking deer, sambar, and wild pig), co-predators (leopard), small cats (rusty spotted, leopard and jungle cats) and other small carnivores (jackal, common palm civet, small Indian civet, grey mongoose) both on the existing forest road as well as its adjoining areas (Appendix 4). In fact, two photographs of rusty spotted cat obtained at a trap station on the road near Morghati Forest Rest House are the first record for Corbett Tiger Reserve. This study has clearly demonstrated the heavy wildlife use of the existing road and its adjoining forests. As revealed by our study, tiger captures on the road were considerably high in places with contiguous habitat on the southern part of the road connecting to Bijnor Forest Division of Uttar Pradesh (Appendix 2). Any plan to upgrade this forest road will negatively affect the wildlife use of this area.

Thoughtful planning keeping in mind the biological needs of threatened species such as tiger

All gujjars between Kalagarh and Pakhro showed keen interest in a voluntary relocation program on the lines of Rajaji National Park. Lack of education for the children was the main reason cited by the gujjars to move out of the forest. Relocation of human settlements from the core area (Dhara, Jhirna and Kothi Rau) of Corbett has transformed it in to the highest tiger density area across Asia. The Sonanadi Wildlife Sanctuary in Corbett Tiger Reserve holds similar potential of harbouring very high tiger density

and elephant is required to realign the existing road outside the boundary of Corbett Tiger Reserve.

Limitations of the study:

The camera trapping exercise between Kalagarh and Pakhro was carried out during peak monsoon period. Unpublished data from Rajaji National Park indicates that there is considerable seasonal variation in tiger capture rates, resulting in low estimates of density in monsoon in comparison to that of winter.

Besides, many of the trails used

for camera trapping were under dense vegetation cover, making deployment of traps difficult for us. Heavy rains all through the study restricted our mobility affecting daily monitoring of many trap sites.

High moisture content also affected the sensitivity of cameras, thereby resulting in loss of captures. The camera trapping (between Kalagarh and Pakhro) if conducted in winter could yield a higher density estimate for tigers using this part of Corbett Tiger Reserve.



Indo-Nepal consultations

Fifth Meet On Challenges Confronting Conservation And Ecological Security In Trans-Boundary Region

The first stock taking conference of senior officials and experts to Review the Implementation of the Global Tiger Recovery Programme was organised between 15-17 May 2012, at Vigyan Bhawan in New Delhi. This conference was hosted by the National Tiger Conservation Authority, Ministry of Environment and Forests, Government of India and co-organized and co-sponsored by the Global Tiger Initiative (GTI) and Global Tiger Forum (GTF), and the World Bank.

During the conference, latest best practices and technology for tiger habitat conservation, wildlife crime enforcement, reducing demand for wildlife derivatives and sustainable development were discussed. This occasion was also utilized to sign the joint resolution between Nepal and India.

In pursuance of the resolutions made in the earlier consultative meetings, the representatives of the two sides, while expressing concern on the increasing threats to biodiversity caused by various factors and realizing the urgent need for an effective strategy to address the problem confronting the biodiversity conservation and ecological security in the trans-boundary region, resolved to:

- Formalise the draft MoU between India and Nepal with due consultation
- Expedite redressal of issues relating to seized material of Red Sanders
- Provide funding support for creation of a rescue centre at Chitwan National Park, at an early date through the Global Tiger Forum (GTF).
- Facilitated regular trans-boundary meetings and information sharing at central and field levels and exchange visits of officials of both the countries.



NTCA member secretary Rajesh Gopal with DG, National Parks of Nepal Krishna Acharya

- Undertake landscape level assessment of tiger, rhino and elephant.
- Support mutual exchange of scientific advancements relating to innovative wildlife research, scientific studies, assessment and monitoring including source-sink populations.
- Identify and establish towards restoration of wildlife corridors and connectivity between India and Nepal.
- Conduct activities to improve livelihoods of local communities around habitats.
- Foster education and capacity building using existing facilities like Wildlife Institute of India
- Facilitate functioning of the South Asia Wildlife Enforcement Network (SAWEN).
- Identify areas of joint actions namely illegal wildlife trade, corresponding trade routes and information sharing.
- Implement provisions of CITES on issues of mutual concern with a focus on control of trans-border smuggling of Red Sanders and other CITES species.



Country report: India

S P Yadav



POLICY AND INSTITUTIONS

The 'in-principle' approval has been accorded by the National Tiger Conservation Authority for creation of five new tiger reserves, and the sites are: Pilibhit (Uttar Pradesh), Ratapani (Madhya Pradesh), Sunabeda (Orissa) and Mukundara Hills (including Darrah, Jawahar Sagar and Chambal Wildlife Sanctuaries) (Rajasthan) and Sathyamangalam (Tamil Nadu). Final approval has been accorded to Kudremukh (Karnataka) for declaring as a Tiger Reserve. Besides, the States have been advised to send proposals for declaring the following areas as tiger reserves: (i) Bor (Maharashtra), (ii) Suhelwa (Uttar Pradesh), (iii) Nagzira-Navegaon (Maharashtra), (iv) Guru Ghasidas National Park (Chhattisgarh), (v) Mhadei Sanctuary (Goa) and (vi) Srivilliputhur Grizzled Giant

Squirrel / Megamalai Wildlife Sanctuaries / Varushanadu Valley (Tamil Nadu). The total area under tiger reserves stands increased to 53366.36091 sq km.

HABITAT MANAGEMENT

The country level assessment of tiger, co-predators, prey and habitat has been done in the GIS domain by the NTCA / Project Tiger in collaboration with tiger States and experts in 2010. This is the second round of such snapshot assessment after 2006. Six major tiger landscapes have been recognized with tiger source areas alongwith their corridor connectivity.

The source areas for tiger (core/critical tiger habitats) are being made inviolate through an enhanced, voluntary relocation package of Rs. 10 lakhs per family vis-à-vis the provisions of the Wildlife (Protection) Act, 1972

read with the Scheduled Tribes and Other Forest Dwellers (Recognition of Forest Rights) Act, 2006.

Guidelines have been issued for corridor restorative plans and action has been taken by states like Madhya Pradesh for developing such plans. The Government of India has provisions to fund such areas (outside tiger reserve/protected area system) for wildlife conservation.

The buffer zones of tiger reserves are being managed as multiple use areas with Project Tiger support for social buffering to reduce dependency of local people on forests, besides securing habitat supplement with the support of local people for tiger and other wild animals.

CONTROLLING PREY & TIGER POACHING

Thirteen sensitive tiger reserves

have been identified and MOU has been signed for raising, arming and deploying the STPF. Funding support has been provided to four tiger reserves based on the MOU towards deploying STPF. Karnataka has already deployed the STPF. Besides, the local workforce is involved in a big way in all the tiger reserves in the form of antipoaching squads to complement the frontline staff. In many tiger reserves, ex-Army personnel, homeguards are also deployed as antipoaching squads with Project Tiger support.

CONTROLLING ILLEGAL TRADE AND REDUCING DEMAND

The surveillance system is being refined. A pilot initiative involving intelligent thermal cameras has been launched at Corbett for 24x7 surveillance.

M-STripes has been launched in 7 tiger reserves to ensure effective patrolling and reporting. The tiger reserves have been supported for equipment, arms and ammunition, vehicles, wireless towards antipoaching operations.

The capacity building of frontline staff has been supported to ensure effective prosecution.

The Wildlife Crime Control Bureau has been created and is collating wildlife related crime information / intelligence etc. while disseminating the same to prosecuting agencies, besides keeping check at exit points.

There is no indigenous demand in India for body parts and derivatives of tiger and other big cats. However, timely payment of compensation to local people for livestock depredation is being ensured, besides enforcement agencies along the border have been collaborated in bordering reserves like Valmiki and Dudhwa to check trafficking of wildlife body parts. The Wildlife Institute of India has also organized orientation courses in wildlife for such

enforcement agencies operating along borders.

TRANSBOUNDARY COLLABORATION

A new bilateral protocol for conservation of Royal Bengal Tiger has been signed with Bangladesh in the context of Sundarbans in 2011. A Joint Working Group has been constituted by the Ministry in this regard. Two senior scientists from Wildlife Institute of India participated in a roundtable at Bangladesh in April/May, 2012 for tiger monitoring / estimation within the ambit of the said protocol. Initiatives are also underway for supporting Bangladesh for capacity building of officers / staff in Wildlife Institute of India.

Within the ambit of a bilateral arrangement with Nepal, an Indian delegation visited Nepal for further needful action.

Within the ambit of the Indo-Chinese protocol of tiger, an Indian delegation visited China in April, 2011.

A sub-group on tiger / leopard has been constituted within an existing bilateral arrangement with Russia and both the parties met in New Delhi while agreeing on the future course of action.

Initiatives have been taken for evolving bilateral arrangements towards tiger conservation with Bhutan and Myanmar.

COMMUNITY ENGAGEMENT AND TIGER-HUMAN CONFLICT

The Wildlife (Protection) Act, 1972 provides for creating core and buffer zones within a tiger reserve. Based on the statutory provisions, the tiger reserves are supported for addressing the man-tiger interface. The local communities are engaged in a big way in tiger conservation. Under Project Tiger, as many as 24 lakh mandays are generated in all the tiger reserves per annum to benefit local people who serve as workforce. The 'inclusive' agenda of managing the buffer zones

of tiger reserves is supported under Project Tiger with a focus on village level micro-planning, besides ensuring reciprocal commitment with them on a quid-pro-quo basis to conserve tigers.

The compensation for losses to local people is paid within the ambit of citizens charter to elicit public support. This is supported under Project Tiger. Recently, the compensation amount has been doubled as well. Advisories have been issued for adequate and timely payment of such compensation.

The NTCA has been strengthened / decentralized with three Regional Offices. There is a need for strengthening the Regional Offices of the NTCA at Nagpur, Guwahati and Bengaluru (AIGs posted at Nagpur and Bengaluru Regional Offices. Process is underway for posting IGFs in the three Regional Offices, besides an AIG at Guwahati).

The second round of independent assessment based on refined criteria was done in 2010-11 for 39 tiger reserves. This assessment is based on the globally used framework, as adapted to Indian conditions. Five independent teams conducted the evaluation using 30 indicators. The framework consists of 6 elements: context, planning, inputs, process, outputs and outcomes. The 39 tiger reserves were grouped in same landscape clusters as done in tiger estimation. An additional category comprising of tigers in 'red corridor' has been included, besides a separate category for reserves where tigers have gone locally extinct. Out of 39 tiger reserves, 15 were rated as 'very good', 12 as 'good', 8 as 'satisfactory' and 4 as 'poor'. 28 tiger reserves were compared with the MEE ratings of 2005-06. It is inferred that the 'very good' category increased by 4%, 'good' category increased by 3% and 'satisfactory' decreased by 7%.



Udaishringi

INSTITUTIONAL DEVELOPMENT AND CAPACITY BUILDING

The Project Tiger Scheme allocation has been stepped up during the five year plan period ending in March, 2012 from the earlier Rs. 650 crores to Rs. 1216.86 crores.

A provision for acquisition of private land for making the core / critical tiger habitat inviolate has been added in Project Tiger. A provision has been made in the Project Tiger Scheme for establishment of interpretation /awareness centres in buffer / fringe areas, besides managing such centres through village level institutions.

Funding support has been provided to all tiger reserves for Phase-IV reserve level monitoring. Capacity building of officers and staff of tiger reserves has been supported.

SCIENTIFIC MONITORING, SURVEYS, RESEARCH

The NTCA is supporting research projects for radio telemetry monitoring of tigers in some major tiger reserves, besides genetic studies to ascertain the gene flow

from source areas.

After completing the second country level snapshot assessment of tiger, co-predators, prey and habitat in 2010, the reserve level continuous intensive monitoring has been launched through camera traps, distance sampling and genetic analysis of scats for minimum numbers.

A national repository of camera trap photo database is being developed.

MAJOR ACHIEVEMENTS

Added 2 new tiger reserves amounting to 2594 sq.km. making a total of 53366.36091 sq.km. of tiger habitat in the form of 41 Tiger Reserves, representing a 5 percent increase in tiger habitat under protection. Five more tiger reserves (4,000 km²) are under establishment and another six (4,500 km²) proposed. Collectively, these will increase the tiger habitat under protection by 24% since the Tiger Summit.

Nationwide tiger and prey estimations recorded modest increase in tiger numbers; annual intensive monitoring of tigers, prey, and habitat initiated; trans-

parent and independent monitoring and evaluation of tiger reserves being done, wildlife corridors connecting critical tiger breeding areas identified and published.

US\$20 million allocated for relocation of villages from eight identified tiger reserves to create inviolate core habitats; Special Tiger Protection Force sanctioned in 13 tiger reserves. Held series of bilateral meetings with Bangladesh, Bhutan, China, and Nepal on tiger conservation and signed a bilateral protocol with Bangladesh for transboundary cooperation.

MAJOR CHALLENGES

Sustaining the integrity of core tiger habitats and corridors vis-à-vis development, \$1 billion needed to relocate villages out of the core areas. Maintaining tiger occupancy in habitats outside tiger reserves (20% decrease in tiger occupancy observed in habitats outside designated tiger reserves). Managing human-wildlife relationships (increased tiger-human conflict in some landscapes).

Manas recovery

By Anindya Swargowari, Amit Sharma,
Deba Kr Dutta & Jayanta Das

The Indian Rhino Vision (IRV) 2020 is a joint program of the Assam Forest Department, World Wide Fund for Nature (WWF) and the International Rhino Foundation (IRF), formulated by the 'Task Force for Translocation of Rhinos within Assam' in November 2005. The aim was the long-term conservation of the rhinos in the state through enhanced protection and range expansion and the vision set was to have 3,000 rhinos in the wild, spread over seven protected areas by 2020.

The plan was to secure the existing rhino population in Kaziranga NP, Pobitora WLS and Rajib Gandhi Orang National Park and to re-introduce rhinos in the potential habitats identified, namely Manas NP, Dibru Saikhowa WLS, Laokhowa-Bura Chapori WLS with a viable population of rhino through wild to wild translocations from Kaziranga NP and Pobitora WLS. To assess the feasibility, specialized teams for security and habitats were formed and field studies undertaken in the identified potential area.

From the reports received, the taskforce decided to select Manas NP as the first site to re-introduce the rhinos after corrective measures as per suggestions made in the reports. These proactive efforts received acceptance globally and support, both financial and technical were made available by international organisations and donors as well as the local government, the Bodoland Territorial Council.

Manas National Park with an area of about 500 sqkm forms the core of Manas Tiger Reserve and is situated on the northern



bank of the Brahmaputra River along the Indo-Bhutan international boundary. Manas was once home to around 100 rhinos, but the entire population was wiped out during ethnic unrest from 1988 to 2001, and the rhino was rendered locally extinct in the park. Today, Manas has regained its status of a world heritage site

as a result of the all-round preservation and conservation efforts undertaken in the park (UNESCO, June 2011). It

REVIVAL ACTIVITIES IN MANAS
Protection is a key factor in the conservation of rhinos in any park and re-introduction of rhinos in Manas was a huge chal-

lenge as the park was not in any shape from the security point of view though its habitat was found suitable. As per assessments made by the security team in 2005, the main constraints were shortage of manpower and infrastructure. It was found that the vacancy was in excess of 100 in the park; only 16 camps existed of which only a few were manned and fully functional, the arterial patrolling roads were not fully functional and there was a huge gap in terms of capacity (vehicles, wireless, trainings, etc).

As per the suggestions, rebuilding of the park started for the first time after the return of peace in the area. Financial and technical assistance came from all partners of the program, especially World Wildlife Fund, International Rhino Foundation, US Fish and Wildlife Service and also from the Bodoland Territorial Council.

It was identified that at least 12 camps under Basbari and Bhuyapara Range. The first two camps were started in Kuribeel (Basbari) and Dhanbeel (Bhuyapara). Twelve base stations and 50 handsets were backed up by 50 additional batteries, 12 solar charging units and two generator sets. Four rubber boats and six country boats were also introduced, as were 80 bicycles, four motorcycles and two four-wheel drive vehicles for monitoring. The roads were also improved and the arterial roads were made motorable.

The staff was trained on various aspects of rhino conservation, especially monitoring using telemetry equipment. They were given field gear for performing their duties efficiently. Manpower strength was also boosted by providing support for engaging 50 armed home guards and 50 conservation volunteers. The 50 conservation volunteers were selected from the fringe villages as the youths were found to be pro-con-

servation and also to provide direct livelihood support, thereby helping forge a direct link between conservation and the local community and generate support towards the program. In addition awareness programs were organized among the fringe communities and local NGOs.

RHINOS IN MANAS

Based on multiple assessments by the security group and the progress on the ground, it was decided to move four rhinos into the park, starting in 2008, after obtaining necessary permissions from the Government of India. Plans were made to translocate 20 rhinos to Manas as the founder population from Pobitora WLS and Kaziranga NP.



As a part of the training phase, two male rhinos were released in Manas on April 12, 2008 transported on trucks from Pobitora by a special team. The rhinos were radio collared and monitored on a daily basis to understand their ranging as well as their behaviour and all these indicated that the rhinos had adapted well and the habitat was quite favorable. Thereafter, 16 more rhinos have been translocated to the park in

batches — two rhinos were released in December 2010, four in January 2011, two in January 2012, four in February 2012 and four more in March 2012. Till date, 18 rhinos have been released in the park in batches under IRV2020 through wild to wild translocations. The rhinos are fitted with radio collars and monitored regularly using radio telemetry as well as standard traditional methods. The rhinos are distributed in all the three ranges of the park and are adapting well to the habitats as analysed from the data generated and maintained on a GIS platform. The park also houses five rhinos which are under rehabilitation and in total there are now 22 rhinos in the park.

CONCLUSION

Reintroduction of wild rhinos in Manas is marked as a great conservation success story as the rhinos have adapted well. It has also provided the necessary initial impetus for the revival of the park, as tourists, locals and conservationists appreciate seeing the rhinos back in Manas. The plan is to have a founder population of 20 rhinos in Manas and hopefully the target will be achieved during the current year.

Recently, Kawal Wildlife Sanctuary in Adilabad district of Andhra Pradesh has been declared as a tiger reserve by the Andhra Pradesh government. The sanctuary is rich in floral and faunal diversity and also a potential habitat for tigers, having corridor connectivity with the Tadoba Andhari tiger reserve of Maharashtra and Indravati in Chhattisgarh through the Adilabad territorial forest areas.

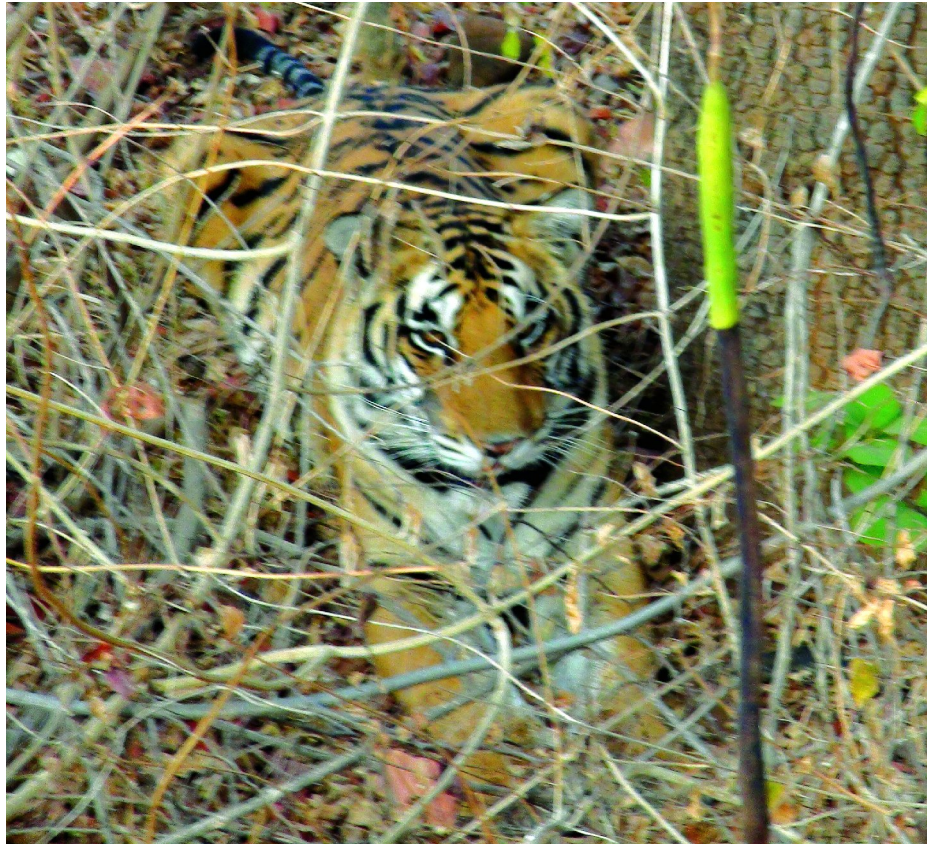
Though it was declared as a game sanctuary in 1965 and finally notified as wildlife sanctuary in the year 1999, conservation has not been up to the desired level due to several problems. So NTCA (headquarters) directed a rapid appraisal of the tiger reserve by Shivakumar C M, (AIGF, NTCA, Bangalore regional office) and Jyotirmay Jena (WWF-India).

A field visit was made to the tiger reserve on April 14 and 15 this year. This report comprises observations made during the field visit after discussions with forest department officials and local people.

ADMINISTRATIVE SET-UP | The tiger reserve spans two divisions, Janaram and Nirmal. Both DFOs report to the conservator of forests (territorial) who is headquartered at Adilabad. At circle level, the conservator of forest (territorial) is entrusted to supervise and coordinate the territorial forest activities, so he may not be giving much attention to wildlife management activities of the tiger reserve and this is also true with DFO of Nirmal division as he is managing both territorial and wildlife ranges. Again, in respect of buffer area management, it becomes further complicated as the buffer will fall under the administrative control of three territorial divisions — Adilabad, Bellampally and Nirmal. It is desirable to reorganize the divisions and ranges that fall

Kawal: A rapid appraisal report

By Shivakumar C M, AIG (NTCA), Regional Office, Bangalore



S P Yadav

under core and buffer for effective management.

MANAGEMENT APPROACH | The existing management is mainly focused on protection of valuable teak trees and timber in the reserve. The management orientation of the field staff is to carry out traditional territorial forest activities and they are not aware of handling wildlife protection and management issues.

PROTECTION ISSUES | The entire area of Kawal tiger reserve was under the influence of left-wing extremist groups for almost two and a half decades i.e. from 1982 to 2009, so in the past, effective

protection measures were not taken up. The main protection strategy was aimed at protecting the teak trees rather than wildlife.

Heavy anthropogenic pressure: There are around 37 recognized villages inside the core area and 21 recognized villages in the buffer. In addition to this, there are around 35 illegal hamlets located in the tiger reserve. The major tribes in the reserve include Gonds, Nayakpod, Kolam, Lambada and Banjaras. All these people living in and around the reserve are heavily dependent on the forests to meet their needs. The forest around many villages is degraded to some extent because

of pollarding of trees for fodder and fuel wood. Bamboo is being heavily used by the local people for their livelihood.

Fire management: As the forest is dominated by dry deciduous vegetation, majority of the area is prone to and affected by ground fires. Most of the fires are induced by locals people for collection of NTFP, beedi leaves and mahua flowers.

Encroachments: Some 80-90 sqkm of forest land in the core area of the tiger reserve has been encroached upon and most of the rights have been recognized under Forest Rights Act, 2006. Unfortunately while issuing the titles to the right holders, no demarcation has been done on the ground either with pillars or by digging trenches. So it is very difficult for the field staff to check further encroachments in the future in the absence of demarcation. This problem needs to be addressed at the earliest to minimize further encroachment.

Hunting and poaching: As the reserve is thickly inhabited by traditional hunting tribes, hunting and poaching of wild animals cannot be ruled out. It is suspected that local people are poisoning water bodies to kill animals and fish. Local staff have been advised to regularly monitor water bodies, especially during the lean period of the year. It is gathered that there are 37 pending wildlife offence cases in the tiger reserve. In March this year, an incident of leopard poaching was reported in the reserve.

Timber smuggling: Organized groups of smugglers are involved in teak smuggling to Hyderabad and Secunderabad. In Jannaram division itself, around 565 illicit felling cases have been compounded and Rs 37 lakh has been collected as compensation.

ISSUES AND CONCERNS

- Urgent need to strengthen anti-poaching camps by providing necessary manpower and basic infrastructure. Number of base camps also needs to be increased
- Unified management control over the core and buffer area of the reserve needed for better habitat management
- Creation of strike force to deal with illicit felling, encroachment and wildlife offences
- Demarcation of boundaries & preparation of maps needed. Coordinated efforts from

police, revenue and forest department needed to handle largescale encroachment

- Dependency of local people on forest has to be reduced by providing alternate livelihood options through EDCs
- Proper budgetary support has to be ensured to take up at protection measures
- Communication network needs to be improved
- Standard protocol of NTCA for monitoring of tigers, co-predator and prey needs to be adopted

Road network: There are two highways of about 40km stretch that pass through the reserve. It is learned that majority of trucks pass through the reserve to avoid payment of toll on NH7 which, connects Nagpur and Hyderabad. Though traffic movement has been regulated from 9pm-6am, it is learnt that there is lot of pressure on local forest officials to allow vehicles during that period.

Surveillance and intelligence: As such there is no systematic security plan in place for surveillance and intelligence gathering, which needs to be developed.

Man-animal conflicts: One human death has been recorded in around 30 cases reported so far.

Staff position: There are only a few vacancies in the reserve. But given the protection issues, there is an urgent need for a strike force to deal with encroachments, illicit felling and wildlife offences.

Communication & network: There is no wireless network.

Anti-poaching camps: Locally, the APCs are called base camps. There are 13 base camps in the reserve, which are basically open bamboo huts used for day camping and which cannot be used during the rainy season. There is an urgent need to improve the condition of existing base camps. The number of base camps also needs to be increased considerably by in view of the existing problems.

Habitat management initiatives: To protect grass patches inside the tiger reserve from cattle grazing, cattle proof bamboo fencing has been made. To meet water scarcity during the lean period, few artificial water bodies have been created at many places.

Monitoring: As the core area falls in two forest divisions it is learned that proper monitoring of tiger, co-predator & prey is not being done uniformly. For the proper monitoring as per the standard protocol of NTCA, training needs to be imparted to the field staff.

Summary records of the meeting of field directors

The All India meeting of field directors and chief wildlife wardens was held on May 2-3, 2012 at New Delhi. The meeting commenced with a welcome address by Dr Rajesh Gopal, PCCF & Member Secretary, National Tiger Conservation Authority (NTCA). He emphasized that tiger reserves in the red corridor deserved special attention. He added that the NTCA would send special teams for appraisal of Phase-IV monitoring, man-animal conflict management, XI Plan period implementation of the Centrally Sponsored Scheme of Project Tiger and action taken vis-a-vis MEE recommendations.

This was followed by release of a book on Wildlife Management authored by Dr Rajesh Gopal, Member Secretary (NTCA), besides a compilation from 'Aranyak' and the Kaziranga Tiger Reserve of camera trap records by the Hon Minister, MoEF, Smt. Jayanthi Natarajan.

The NTCA awards for excellence for year 2010-11 were distributed by the minister to tiger reserves in 11 thematic categories.

During the subsequent technical session, the field directors of the 38 tiger reserves made elaborate presentations highlighting the specific issues arising in their reserves.

CORBETT | Progress on '24x7 electronic surveillance' (e-Eye), implementation of 'M-STRIPES'. Declaration of a 'silence zone' upto a radial distance of 500m around the tiger reserve border and need for phasing out tourism infrastructure from Dhikala.

DUDHWA | Poaching continues to be a problem along Indo-Nepal border and the entire Terai belt, trans-border cooperation lacking. As many as 183 offenders arrested, 83 jailed last year.

RANTHAMBORE | Regular antipoaching operations, special initiatives taken to protect the habitat from illegal livestock grazing. Village relocation is ongoing, 66.2% completed.

SARISKA | GPS based tiger tracking/patrolling on, regular monitoring protocol for reintroduced tigers being followed with five dedicated teams. Pressure from the local people for repairing the highway passing through the tiger reserve.

PALAMAU | As much as 1/3rd of reserve affected by left wing extremism, and the situation continues to be alarming. Difficulties in implementing MEE recommendations, such as left wing extremism, untimely release of funds by state and paucity of field staff.

SUNDARBANS | Land-based camps have been created for strengthening protection. Tiger monitoring protocol developed, registration of boats initiated.

BUXA | Biotic pressure on account of 32 forest villages besides 42 peripheral villages and nearby tea estates. Need to address issues relating to area of concern with Bhutan at government level.

BANDHAVGARH | Camera traps towards Phase-IV will be

deployed once monitoring process in Kanha is completed. Twelve villages inside reserve, besides several others on the periphery and beyond, leading to conflict situations. Need to regulate tourism infrastructure in the area, besides tourist visitation within the reserve.

PENCH | Buffer zone not under control of the field director. More funds required to carry out Phase-IV monitoring. In context of MEE observations, recruitment process is under way for STPF.

PANNA | Reintroduction of tigers a success. Large number of road-kill in nearby highways. Independent research officer required. Need to improve corridor connectivity to facilitate movement of wild animals.

SATPURA | Notification of buffer zone under way, village relocation in progress. Shortage of forest guards and field vehicles.

KANHA | Special grassland firing regime has been developed. Central assistance required for expediting village relocation.

SANJAY | Corridor linkages between Sanjay-Dubri, Bandhavgarh and Achanakmar Tiger Reserves need restoration.

INDRAVATI | Problems due to left wing extremism. Paucity of field staff. Buffer not under unified control of field director.

ACHANAKMAR | All cattle camps removed from core area. Black leopards have been reported from the area.

UDANTI-SITANADI | Diamond mining ongoing outside core area. Need for joint patrolling along interstate border areas.

KAZIRANGA | Complaints regarding illegal mining and encroachment must be looked into. Unified control over buffer should be established.

MANAS | Reintroduction of rhino in its historical range is being done as a part of 'India Rhino Vision-2020'. Illicit grazing a major problem.

NAMERI | Prone to insurgency problems. Huge encroachment in western and eastern parts of the buffer resulting in habitat loss. Buffer not under control of field director. Delay in release of central assistance. Support required for dealing with wild elephants

NAMDAPHA | Encroachment by Lisus within the reserve is a serious problem on account of poaching threat. Notification of buffer zone not done.

DAMPA | Poaching serious issue in border areas alongwith left wing extremism.

MELGHAT | Two state highways pass through the reserve, large number of villages in and around the reserve. Delay in release of central assistance.

PENCH (MAHARASHTRA) | Illegal fishing serious issue common to Maharashtra and MP portions of Pench. Only one village needs to be relocated for which land is available but funds needed.

SAHYADRI | There are 11 villages in Koyana and five in Chandoli which are due for relocation, but 19 may remain in the core. Central assistance has not been released by the state in full

TADOBA ANDHARI | Human-tiger

conflict serious issue in buffer area. Buffer area has been handed over to field director with partial control. Tiger protection force involving local people is helpful.

SATKOSIA | Prone to illegal fishing, poaching and timber smuggling. Administrative setup requires correction and there is no unified control.

SIMILIPAL | 'Akhand Shikar' continues to be big problem alongwith left wing extremism. Four villages due for relocation.

NAGARAHOLE & BANDIPUR STPF including 27 people from tribal community raised and deployed. Elephant depredation has been reduced.

BRT HILL | Training for Phase-IV monitoring done. Tiger photo ID database developed. Daily patrolling log uploaded at web.brt.gov.in.

BHADRA | M-STrIPES launched. Under Phase-IV monitoring, 120 camera traps have been deployed which would be completed by the end of May 2012.

NAGARJUNASAGAR SRISAILAM 94 camera traps have been procured through state funds, NTCA support required. Most recommendations contained in MEE complied with.

PARAMBIKULAM | Twenty-six antipoaching camps for protection. Inadequate trained staff limiting factor. Disturbance due to road/reservoir.

PERIYAR | Gaanja cultivation and poaching reported. Efforts under way to regulate tourism. Buffer zone has not been notified.

KALAKAD MUNDANTHURAI Poor road network affects anti-poaching operations. Pilgrim visitation is a problem.

MUDUMALAI | Tripartite meetings between officials of Kerala, Karnataka and Tamil Nadu held for coordination. Tourism pressure controlled through declaration of eco-sensitive zone.

ANAMALAI | Tea estates have considerable human-wildlife conflicts. 31 tribal settlements with the reserve. Sandalwood smuggling, ganja cultivation a problem.

In his concluding remarks, Dr Rajesh Gopal highlighted the following:

- Anti-poaching operations require topmost priority. Special fortnightly drives should be launched to sanitise the habitat from traps and snares.
- Annual plan of allocation (APO) proposal should judiciously reflect demand for only such interventions which are not supported vis-a-vis the reserve-specific Tiger Conservation Plan.
- The NTCA / Project Tiger is committed to support the new tiger reserves. Hence, indicative plans should be sent at the earliest to facilitate fund release from Project Tiger.
- The Phase-IV monitoring protocol should be followed by all the reserves to ensure uniformity.
- The guidelines of Project Tiger should be scrupulously followed along with provisions of the Wildlife (Protection) Act, 1972, read with the Scheduled Tribes and Other Forest Dwellers (Recognition of Forest Rights) Act, 2006.
- The individual / unique photo captures of tiger should be collated for creating a database which would be used in state level/national database.

DIG (NTCA) S P Yadav requested the participants for early submission of annual plans of allocation with GPS locations of proposed activities, besides providing the utilisation certificates for grant received.

Great strides, fresh focus on tiger conservation

Minister Jayanthi Natarajan's Speech At The All India Meeting of Field Directors of Tiger Reserves and Chief Wildlife Wardens of Tiger States

I am pleased to be here amidst you all for inaugurating this country-level meeting of field directors of tiger reserves and chief wildlife wardens of tiger states. Our commitment for saving the tiger is well known. Since the early 70s, the Government of India and tiger states have collaborated in implementing Project Tiger. We have come a long way from the formative years. The project coverage has expanded from 9 to 40 reserves, spread over almost 46,388 sq.km. in 17 of our States.

Thanks to the vision of Smt. Indira Gandhi, we have the maximum number of tigers and its source areas amongst all the 13 tiger range countries in the world.

Since last year, we have sharpened our focus on the tiger. The Centrally Sponsored Scheme of Project Tiger was revised in August 2011. Its allotment was stepped up to Rs. 1216.86 crore, especially to support the states for securing inviolate space for tigers. Several additional components have also been included: (i) Change in the funding pattern in respect of northeastern states (90:10), (ii) raising compensation for man-animal conflict to Rs 2 lakh (iii) acquisition of private land for making the core/critical tiger habitat inviolate, (iv) establishment of Tiger Safari, interpretation/awareness centres under the existing component of 'co-existence agenda in buffer/fringe areas', and management of such centres through the respective Panchayati Raj Institutions, and

(v) re-introduction of the cheetah.

Field protection continues to remain very high on our tiger agenda. The states are supported in a big way to deploy local workforce for protection. Besides, we are persuading the States to raise, arm and deploy of the Special Tiger Protection Force (STPF). This needs to be expedited by the States. Despite, 100% central assistance to four States (Uttar Pradesh, Uttarakhand, Rajasthan and Orissa), the deployment of STPF has not taken place. I am happy that Karnataka has emerged as the first state to implement this.

The NTCA has supported a pilot initiative in Corbett using information technology in combination with thermal cameras for 24X7 surveillance. This, alongwith the recently launched 'M-STripES' monitoring would strengthen surveillance and field monitoring.

Another important initiative taken recently is the Phase-IV monitoring. The protocol for this has been finalized after much consultation with field officers and scientists. The idea behind is to build up the capacity in our field formations for scientific monitoring. The NTCA would continue to facilitate the States in this regard.

Further, steps have also been taken for setting up a national repository of camera trap photo database of tigers. This would enable linkages with similar repositories in states to keep track of our wild tigers.

In the recent past, we had rec-

ommended for notifying the Kawal Wildlife Sanctuary in Andhra Pradesh as a Tiger Reserve. Further, 'in-principle' approval has also been accorded for declaring the Sathyamangalam Wildlife Sanctuary in Tamil Nadu as a tiger reserve. I am confident this would further strengthen our tiger conservation efforts.

As you are aware, the 2010 country-level snapshot assessment of the tiger and its habitat has registered an increase of 20% over the earlier such assessment in 2006. However, the outcome has highlighted the need for restoring the fringe areas of tiger reserves and the connecting forest linkages.

The independent Management Effectiveness Evaluation of tiger reserves has also underlined the actionable points. Both these findings should be factored in our tiger conservation strategy by reflecting them in the Tiger Conservation Plans of tiger reserves.

Project Tiger is one of the most important flagship programmes of my ministry. Soon after taking over as minister, I have been addressing chief ministers on various issues, besides supporting new initiatives to strengthen the cause...

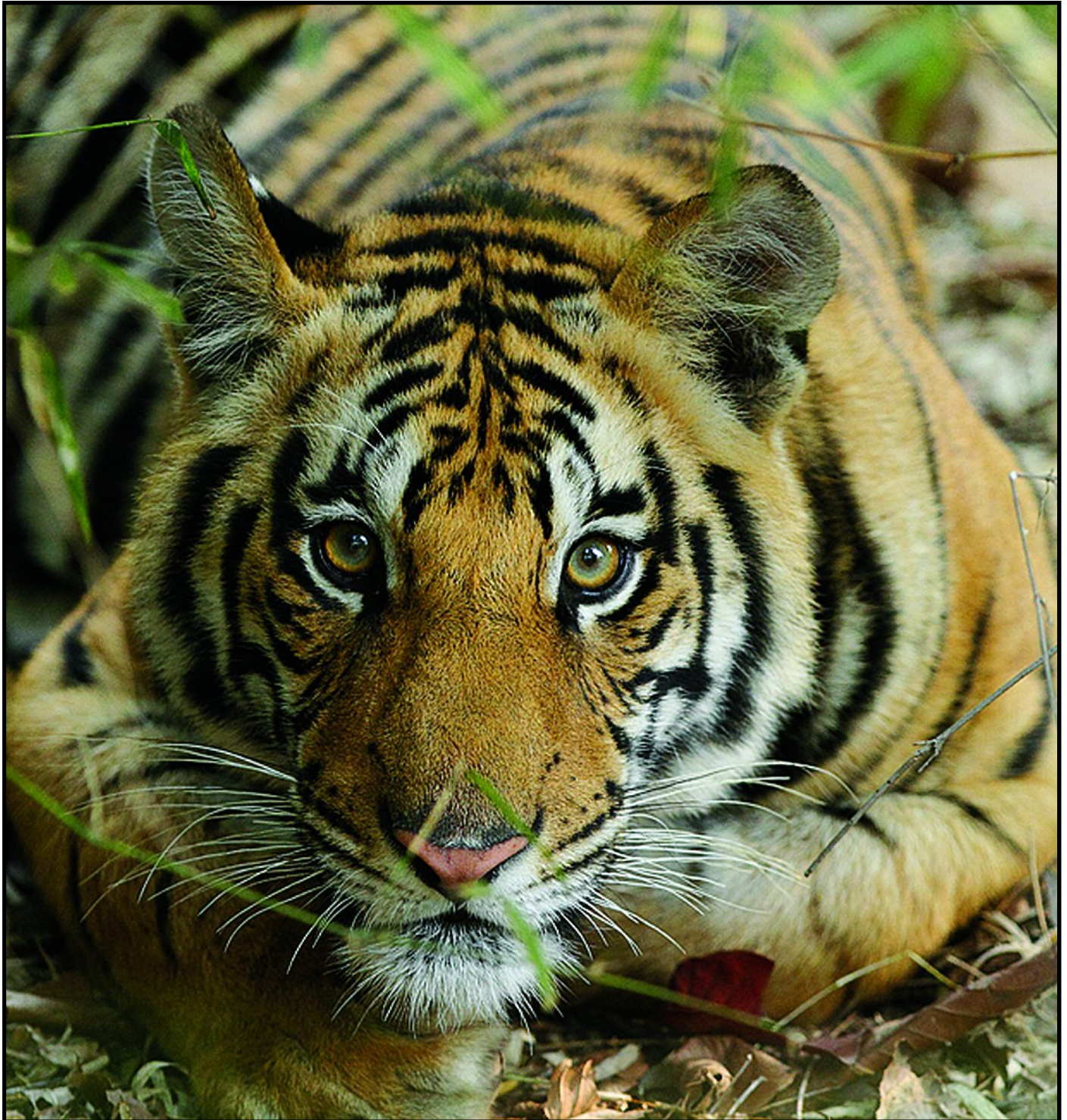
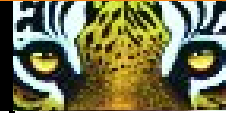
Tiger conservation is a collective responsibility between the government of India, state governments and civil society. I congratulate the tiger reserves receiving the awards for excellence, and I am sure you will keep up the good work.

NTCA AWARD FOR EXCELLENCE FOR 2010-11



Anti-Poaching | Dudhwa (UP), Kaziranga (Assam), Pakke (Arunachal); **Habitat Management** | Kanha (MP); **Village relocation and resettlement** | Satpura (MP); **Co-existence & Buffer Management** | Kalakad Mundanthurai (TN); **Tourism Regulation** | Periyar (Kerala); **Active Management** | Panna (MP); **Innovative Practices** | Parambikulam (Kerala);

Management of Human-Tiger Conflict | Sundarbans (West Bengal); **Effective HR Management** | Nagarjunasagar Srisailem (Andhra Pradesh); **Involvement of Local People & Eco-development** | Mudumalai (TN); **Use of Modern Technology In Tiger Conservation/Protection** | Corbett (Uttarakhand)



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