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

stripes

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TIGER MORTALITY 2011 AS REPORTED BY STATES

Natural & other cause | Accident | Seizure | Inside tiger reserve

Eliminated by dept | Poaching | No. of tiger deaths | Outside tiger reserve

UTTARAKHAND	14	1	1	1	—	17	8	9
KERALA	3	—	—	1	—	4	2	2
ASSAM	3	—	—	2	1	6	4	2
MADHYA PRADESH	5	—	—	—	—	5	4	1
RAJASTHAN	1	—	—	—	—	1	1	—
ORISSA	1	—	—	—	—	1	1	—
TAMIL NADU	3	—	—	—	—	3	1	2
WEST BENGAL	3	—	—	—	—	3	2	1
KARNATAKA	3	—	—	3	—	6	6	—
MAHARASHTRA	2	—	1	2	1	6	1	5
UTTAR PRADESH	—	—	1	—	—	1	1	—
CHHATTISGARH	—	—	—	2	—	2	—	2
BIHAR	1	—	—	—	—	1	—	1
TOTAL	39	1	3	11	2	56	31	25

* One old tiger trophy was seized in Delhi

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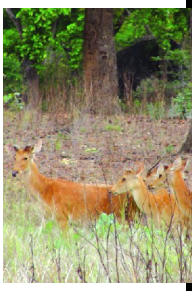

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note from the editor

THE new year, with all its freshness, commenced with a new set of initiatives from NTCA. Looking back, the last six months were equally eventful. In August 2011, the Project Tiger Scheme was revised and its cost estimate was stepped up to support voluntary village relocation from core/critical tiger habitats. Besides, several new components were added: change in funding pattern for TRs in the North-East, raising compensation for man-animal conflict, provision to acquire private holdings within the core, establishment of tiger safari/interpretation/awareness centre in buffer and managing through Panchayati Raj Institutions, and reintroducing the cheetah.

The Phase-IV monitoring, launched recently, is a tiger reserve level monitoring of tiger, its prey and habitat. This needs to be done by the frontline staff and officers of tiger reserves under the overall coordination and guidance of chief wildlife wardens. This ongoing monitoring would bring out yearly status of tigers and its prey in each tiger reserves which would complement the once in four year snapshot assessment of country level tiger status by NTCA, WII, tiger States in collaboration with other experts. Another initiative is to develop a national tiger camera trap photo database. This will help in keeping track of our wild tigers with individual IDs. The launching of "e-Eye" surveillance in Corbett is encouraging.

The Western Ghats is one of our most promising tiger landscapes. This issue carries a feature on its assessment. NTCA has accorded in-principle approval for declaring Sathyamangalam Wildlife Sanctuary of Tamil Nadu, forming part of this landscape, as a tiger reserve. NTCA has also recommended notifying Kawal Wildlife Sanctuary in Andhra as a tiger reserve.

Another interesting feature in this issue is camera trapping of tigers in Kalakad Mundanthurai. Also, Karnataka has earned the distinction of being the first tiger state to raise the Special Tiger Protection Force.

Dr Rajesh Gopal
Member-Secretary, NTCA

Western Ghats Landscape

Vikram Singh

This The Western Ghats (also called Sahyadri Mountains) extend for about 1600 km along the western coastline of India (Ranjit Daniels 1992). In the north, the Ghats are bounded by the Satpura Range positioned in an east-west direction. This range hosts several towns of Maharashtra such as Matheran, Lonavala, Khandala and Panchgani and also forms an important bio-geographical barrier between the Western Ghats and the remaining parts of India. The Vindhya and Ajanta Ranges in the north further strengthen this barrier.

This region with a total forested area of 1,01,467 sq km (Qureshi et al. 2006) comprises nine notified Tiger Reserves, three proposed (Sathyamangalam TR in Tamil Nadu and Kudremukh and Biligiri Rangaswamy Temple Hills (BRT) Wildlife Sanctuary in Karnataka); 20 National Parks and about 68 Wildlife Sanctuaries and forms one of the largest Protected Area networks in India. The Nilgiri and Agasthyamalai Biosphere Reserves are also located within this zone in addition to several reserved forests and sacred groves, totalling to about 5.8% of the total forested area in the Western Ghats alone.

CONSERVATION SIGNIFICANCE

The Western Ghats apart from being a store house of tropical

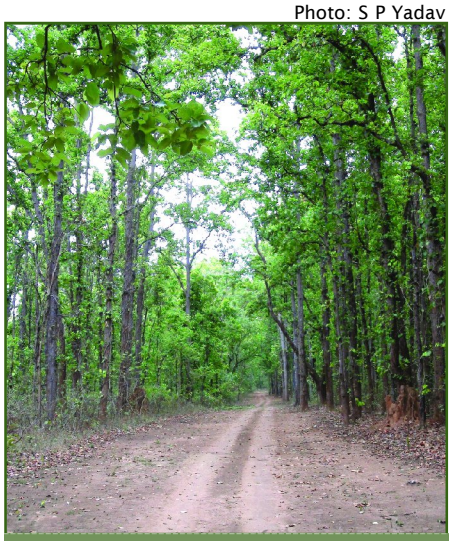
biodiversity are also a source of 38 east flowing rivers and 27 flowing into the Arabian Sea (Dahanukar et al. 2004). These rivers act as important sources of hydro-electric power, water for agriculture and industrialisation downstream and add impetus to the development of large cities in the plains of Karnataka, Tamil Nadu and Kerala.

These hills also structure rainfall and climatic patterns of this region, allowing vast scale plantations of commercial crops while supporting amongst the highest abundances of endangered species of floral and faunal elements in India. Despite sustaining the high diversity of flora and fauna, the region is also susceptible to high levels of anthropogenic disturbances and thus was amongst the first 18 global biodiversity hotspots identified (Myers et al. 2000).

The south Western Ghats moist deciduous forests and the South Western Ghats montane rain forests also constitute two of WWF's 200 global terrestrial ecoregions due to their unique biodiversity with high levels of endemism (Olson and Dinerstein 1998; Olson et al. 2001).

In 2006, the Nature Conservation foundation (NCF), Mysore and the Ashoka Trust for Research in Ecology and the Environment (ATREE), Bangalore submitted a proposal to the UNESCO to include the Western Ghats sub-cluster comprising of the region between the Sahyadris and the Agasthyamalai Hills on the World Heritage List. The proposal is under review. Wikramanayake et al. (1998) recognised two important level one tiger conservation units (TCUs) within this landscape comprising of Dandeli-Bandipur and Periyar-Kalakad regions while Parambikulam National Park was included in level II TCUs based on their importance in tiger conservation. Johnsingh and Goyal (2005) improvised upon this framework and added more details and national level conservation rankings to these landscapes. They also identified breeding habitats and potential threats to each of these TCUs.

Photo: S P Yadav



The Malabar Coast of this region was recognized in the pre-colonial era for its importance as a trading zone for spices, thus plant studies were initiated here by the Dutch and the Portuguese as early as 1565 when Garcia de Orta prepared a list of medicinal plants. The region also hosted one of the first comprehensive botanical treatises (not following binomial nomenclature) from the pre-Linnaean era of the modern world, Hortus Malabaricus (The Garden of Malabar), by Heinrich Van Rheede Tot Draakenstein between 1678-1703. It was in 12 volumes and inspired Carl Linnaeus to write his Species Plantarum.

CONSERVATION STATUS

The major impediments to tiger conservation in this zone are the existence of hydroelectric projects, hunting (Madhusudan and Karanth 2002) and deforestation of large areas for commercial plantations.

Johnsingh and Goyal (2005) recognised TCU 55 which covers the tiger landscape between Silent Valley-Mudumalai-Bandipur and Dandeli (with 7500 km2 under protection and about 2000 km2 of inviolate area) as the most important area for the persistence of the species. They also identified five breeding habitats in this zone capable of sustaining upto 600 tigers and suggested strengthening the connectivity between Mukurthi-Nadugani-Mudumalai to link populations between areas north and south of the Nilgiris. The second important landscape (ranked 8th in the country) was Megamalai-Periyar-Kalakad with 1800 sq km area under protection and capable of holding as many as 100 tigers with a breeding habitat in Periyar. Anamalai unit was recognised as the 9th best landscape with 1600 sq km of protected area with a carrying capacity of 100 tigers.

Jhala et al. (2008) estimated the single largest contiguous population of tigers in India (and probably in the world) within Nagarhole-Mudumalai-Bandipur-Wayanad landscape with occupancy of 10,800 km2 and an estimated tiger population of 280 individuals.

However, despite the conservation impediments, a strong lobby of conservationists in this zone have enabled the creation of inviolate zones in parts of Nagarhole NP and Bhadra Tiger Reserve (Karanth 2007) by relocating villages from both these Protected Areas and making them partially or fully inviolate. Further, they have ensured closure of mining operations in Protected Areas such as Kudremukh National Park (Krishnaswamy et al. 2006) and prohibited the creation of dams which would submerge large biodiversity rich areas in Silent Valley National Park, while,

organisations such as the NCF work in plantation forest mosaics and restore the natural vegetation in those regions (Shankar Raman and Mudappa 2003).

KARNATAKA | The state has 36,190 sq km under forest cover. It has four Tiger Reserves and two proposed TRs, Biligiri Rangaswamy Temple (BRT) Wildlife Sanctuary and Kudremukh. There are also five national parks and 22 wildlife sanctuaries across diverse habitat types of the state. Parts of the Nilgiri Biosphere Reserve also span across the state and include Chamrajanagar, Bandipur and Hunsur forest divisions.

a) Nagarhole Tiger Reserve | The TR is contiguous with Bandipur to the south-east, separated by the backwaters of Kabini reservoir. About 6000-7000 tribals (mostly Kuruba) live within the park with some having chosen to be a part of the 'voluntary relocation' schemes initiated by the forest division and local conservation organizations. The park is also an important site for the India Eco-development Project scheme.

b) Bandipur Tiger Reserve | One of the earliest TRs in the country covering an area of 870.36 sq km at the junction of the Western Ghats, the Nilgiris and the Deccan plateau. The reserve is bounded by Wayanad Wildlife Sanctuaries to the west, Nagarhole to the north-west and the River Moyar to the south which forms a political boundary between Karnataka and Tamil Nadu and separates Bandipur from Mudumalai Tiger Reserve. Human pressures on the park such as livestock grazing and fuel wood collection is high with about 200 villages located within 5 km of the reserve boundary. Two highways, the Mysore-Ooty highway and Gundulpet-Sultan Bathery highway, are a disturbance to wildlife in the area.

c) Bhadra Tiger Reserve | Constituted in 1972 by joining Jagara Valley and Lakkavalli forests in the Malnad region. Small parts of the reserve are also located in Shimoga district. This reserve is often cited as the best example of successful 'voluntary relocation' of people from protected areas with 11 villages having volunteered to move out of the Reserve by 2003. Presence of magnetite ore in the Baba Budangiri Hills and the plans of damming River Somvahini could be major threats to this area.

Subhash Mishra

d) Anshi-Dandeli Tiger Reserve | Forms a contiguous forest patch of about 2200 sq km which links to six Protected areas of Goa and Maharashtra. Anshi National Park to the west of Dandeli shares a border with Goa and receives high rainfall supporting evergreen forests while Dandeli Wildlife Sanctuary faces intense human pressures from the surrounding villages as well as from the paper and plywood industries in Dandeli town.

TAMIL NADU | The state has a forested area of 23,338 sq km. It has three Tiger Reserves while a proposal is awaited from the state for one more, Sathyamangalam. There are five national parks, 21 wildlife sanctuaries and one conservation reserve. Large parts of the State also fall under the Nilgiri Biosphere Reserve, Agasthya Malai Biosphere Reserve and the Gulf of Mannar Biosphere Reserve.

a) Indira Gandhi (Anamalai) Tiger Reserve | Covers 959 sq km in Pollachi, Valparai and Udumalpet talukas of Coimbatore district. Several rivers originate in the Reserve providing water to reservoirs such as Parambikulam, Aliyar, Sholayar and Amaravathi. It has unique Shola habitats at Karian Shola, Grass Hills and Manjampatty.

b) Mudumalai Tiger Reserve | Covers an area of 321 sq km and is located in Gudalur and Udhagamandalam talukas of the Nilgiri district. It is connected to Wayanad Wildlife Sanctuary of Kerala and Bandipur Tiger Reserve of Karnataka. River Moyar traverses the reserve from south to north, parallel to which

runs the Udhagamandalam-Mysore Highway, for some distance. The region has high livestock grazing pressure and human disturbance levels.

c) Kalakad-Mundanthurai Tiger Reserve | Covers 895 sq km of which 550 km2 forms the core and is a part of the Agasthyamalai Biosphere Reserve. The western border of the reserve coincides with the crest line of the Western Ghats. About 14 rivers originate from this area and support three dams which provide hydro-electric power and irrigation facilities to the district of Kanyakumari. The reserve has several settlements which include religious enclaves, private forests, dams, PWD land and encroachments. Fire during the dry season along with grazing and NTFP collection are among the numerous pressures exerted on the Reserve by the 145 hamlets within 5km of the eastern boundary. The Tiger Reserve has demonstrated successful implementation of local community participation in conservation efforts through eco-development projects.

KERALA | Has 17,324 sq km under forest cover constituting 45% of geographical area of the state. The state has two TRs, six national parks, 15 wildlife sanctuaries and two Biosphere Reserves, Nilgiri and Agasthyamalai.

a) Parambikulam Tiger Reserve | Covers 285 sq km and is located within Chittur taluka of Palghat district. It is located between the Nelliampathy Hills of Kerala and the Anamalai Range of Tamil Nadu within a cluster of Protected Areas. The TR has six colonies with indigenous tribes such as the Kadar, Malasar, Muduvar and Malamalasars living in them. There is also a colony in the TR which came up in the 1950s and 60s during the construction of the Parambikulam-Aliyar Project.

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b) Periyar Tiger Reserve | Covers 777 sq km within Pirmed taluka of Idukki district with a small portion in Rani taluka of Pathanamthitta district. To the east of the Reserve are the Srivilliputhur Grizzled Giant Squirrel Wildlife Sanctuary and Tirunelveli Forest Division of Tamil Nadu. The Mullaperiyar dam constructed in 1895 resulted in a lake which covers 26 sq km of the TR. Over five million pilgrims visit the Sabrimala Temple in the reserve each year; disturbing the habitat severely and polluting River Pamba. Only four small settlements exist within the park at Labbakkandam near Kumily, Mannakudy, Paliyakudi and Vanchivayal.

GOA | The state has 2,151 sq km under forest cover, constituting 58% of the total geographical area. The state has one National Park, Mollem, and six wildlife sanctuaries. NTCA recently invited proposal from the state government to declare the Mhadei Wildlife Sanctuary a TR.

Proposed Mhadei Wildlife Sanctuary | Covers 208.48 sq km in Sattari taluka of northeastern Goa. It is connected to the larger tiger landscape of Karnataka around Anshi-Dandeli Tiger Reserve through the Bhimgad Forest in the east and through Bhagwan Mahavir Wildlife Sanctuary in the west.

The latter Protected Area is connected to Mollem National Park and Netravali Wildlife Sanctuary in south Goa which in turn form a contiguous forested landscape with Anshi-Dandeli Tiger Reserve in the Western Ghats of Karnataka. Mhadei, along with Netravali and Bhagwan Mahavir Wildlife Sanctuaries are located within the iron ore mining zone of Goa and are under intense mining pressure.

Some Way Still To Go

Management Effectiveness Evaluation Of Tiger Reserves In India
Processes & Outcomes 2010-2011

Dharm Khandal

In our country it is generally observed that the Government of India alone is fully taking initiatives and responsibility for wildlife conservation and tiger conservation in particular. This is generally reflected in funding patterns wherein the state governments' priority in funding for wildlife conservation is quite inadequate and low. There is large scope for the state level steering committees to meet regularly in time, be much more active and really steer the Tiger Reserves with guidance and support.

Tiger Conservation Plan Legal notification and delineation of nine Tiger Reserve (TRs) falling within this Cluster have all been done appropriately. All TRs have an approved Management Plan but none of them have approved Tiger Conservation Plan. Some of the TRs have an indicative Tiger Conservation Plan (eg Nagarhole) whereas for some of them the formulation of Tiger Conservation plan is still in progress (eg Periyar). The present system of Beat, Section and Range as unit of management, perhaps needs to be evaluated to see whether it is serving the twin major purposes of protection and implementation of developmental programmes.

The enforcement of Wildlife Protection Act. 1972 and The Indian Forest Act /State Forest

Act is done very routinely and perhaps leaves large scope for considerable improvement with better protection plans for each range for prevention, control and detection of offences. Booking of wildlife offences, filing of chargesheets and taking them to logical conclusions in a time bound manner also is absent in most of TRs. It is desirable to ensure that the patrolling of the beat areas by foot, vehicle or other means are not only intensified but monitored and control led at appropriate levels for prevention and detection of wildlife offences. The introduction of anti-poaching camps and watcher systems mostly manned by local tribals in all TRs have definitely reinforced and further strengthened the protection but must be closely watched and controlled to prevent their likely misuse. There is an urgent need to introduce an information and intelligence gathering system and action in all TRs to make protection much more effective. Documentation and record keeping, retrieval and sharing of vital information also needs considerable improvement.

The staff is invariably not adequately trained to manage the TRs and most of them are transferred out frequently resulting in discontinuity of actions. There are no adequate incentives or rewards for better performers and therefore the motivation level is not very high. There is no system in place record the performance of staff and follow it up with adequate responses.

Most of the personnel are not trained in wildlife management in TRs. Training need analysis should be carried out for each TR and suitable training programmes designed to suit their needs should be developed. Continuity of trained staff in TR management needs to be ensured.

The tourism management in most of the TRs is not so well organized. Publicity, advance booking, accommodation, food, transport, interpretation, all needs to be considerably improved. A good feedback system for visitor satisfaction is absent in most of our TRs. Management of local communities has not received adequate attention in the TRs due to various reasons. The communities both inside and in the immediate surroundings are not still accepted as full partners in the management practices. Implementation of Forest Rights Act 2006 is quite tardy and poor in most of the TRs.

The participation of various stakeholders in management of Tiger Reserves (TRs) is just moderate. The Ecodevelopment model practiced in Periyar and Parambikulam TRs are very encouraging and worth emulating in other TRs with local variations to suit their needs. The Ecodevelopment model followed by Kalakad TR in involving the communities both inside and immediate outer periphery are also quite promising but needs considerable strengthening to ensure sustainability. We must recognize the importance of developing a Tiger-Man ecosystem in each TR with a well balanced approach to take care of both tiger and human needs in all aspects. The conservation of tiger and biodiversity in each TR is dependent upon the development of villages both inside and outer periphery of TRs. The only way to garner and elicit the active support of local community in tiger conservation is to meet all the immediate and felt needs of those villagers by the consistent effort of TRs.

Therefore there is an immense need to integrate the development of villages both inside and outer periphery of TRs with conservation of Tiger and all biodiversity in the Tiger Conservation Plan. A mechanism has to be evolved for each TR to ensure active participation of researchers, developers, sociologists, planners, tourists, students and villagers in planning, management and monitoring of TR.

As the herbivorous population has considerably increased in

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The enforcement of wildlife laws leaves large scope for improvement

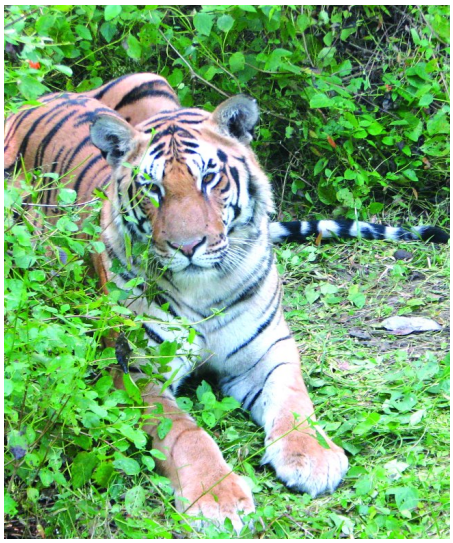
M S Dungriyal

numbers in TRs they are straying into adjacent agricultural fields resulting in huge losses of agricultural crops, threatening even the livelihood options of marginal and poor farmers. Most of the damages are caused by wild boars and porcupines. It calls for active management of those populations by various means including policy level changes.

BANDIPUR

Strengths | TR is part of large landscape supporting largest population of tiger in the country and has contiguity with adjoining Mudumalai TR, Nagarhole TR and Wayanad WLS. Core area free from human settlements.Good support of scientific institutions and adequate baseline information. Good support of NGOs.Effective system of visitor management.

Weaknesses | Spreading invasive species particularly Lantana. Weak support of local communities due to weak Ecodevelopment programmes. Increasing Human Wildlife Conflicts in certain pock-



M S Dungriyal

ets. Weak component of staff training. Still some important corridors are outside TR.

Threats | Increasing number of private resorts around TR thereby creating more tourism pressures. Increasing conflicts with the local communities due to elephant depredation. Proposed projects and other developments in and around TR (including the future possibilities of widening of Mysore-Ooty Road). Likely spread of diseases to the wild animals from adjoining livestock.

Opportunities | Increasing support of government for biodiversity conservation. Increasing interest of researchers and other stakeholders in the area.

NAGARHOLE

Strengths | TR has sound protection strategy in place. TR is part of large landscape due to adjoining Bandipur TR and Wayanad WLS and this landscape holds biggest tiger population in the country. Populations of tiger are stable in the last several years. There is a good support of research institutions and hence good scientific baseline particularly of tiger and its prey.TR has experience of implementing good relocation programme .

Weaknesses | Core area has settlements and resultant biotic pressures. Weak support of local communities and NGOs and inadequate participation of stakeholders in general. Increasing anthropogenic pressures and

weak ecodevelopment programmes for livelihood support of local people. Inadequate resour ces and allocations. Inadequate visitor services and information. Inadequate trained frontline staff. Frequent transfer of officers.

Threats | Growing tourism. Growing conflicts with some stakeholders. Developmental projects in the adjoining areas including plantations. Growing human wildlife conflicts.

Opportunity | Growing interest of research institutions in the area. Growing support of Government for conservation.

BHADRA

Strengths | Location and connectivity to adjoining areas. Sound protection. Sizable area free from human habitations and a rich experience of rehabilitation of villages. Strong support of people and NGOs. Rich habitat / water resources. Potential tiger population and associated rich prey base.

Weaknesses | Inadequately maintained road network and infrastructure. Spreading invasive species. Still some human settlements inside. Some pressures from fringe areas/buffer. Inadequate capacity of staff. Weak baseline information and long term monitoring.

Threats | Human wildlife conflicts. Likely spread of tourism in the vicinity of TR. Leased area to SAIL still not closed. Proposal of raising the height of existing Bhadra Dam.

Opportunity | Recently established Tiger Foundation. Growing interest of research among institutions and individuals. Biologically rich areas adjoining the reserve. Potential of awareness raising

DANDELI-ANSHI

Strengths | Location and connectivity to adjoining PAs of Goa and forest areas of Karnataka. Motivated team in place. Good support of local people and NGOs. Important semi evergreen habitat for tiger and associates. Planned tourism and education facilities.

Weaknesses | 52 villages in side TR some of these well-developed. Spreading invasive species and some exotics in side TR. Inadequate capacity of staff. Inadequate baseline information and long term monitoring.

Threats | Increasing human wildlife conflicts. Future pressures of tourism in and around TR if not planned. Difficulty in relocation of well-developed agriculture enclosures

Opportunity | Recently established Tiger Foundation. Growing interest of research among institutions and individuals. Potential of awareness raising.

PERIYAR

Strengths | Core area free from human habitations and sound connectivity to adjoining areas. Forming part of large Periyar-Agasthyamalai landscape. Sound support and involvement of communities through ongoing ecodevelopment and ecotourism programmes. Good scientific baseline information. Active Tiger Foundation. Emerging centre of learning for community participation in biodiversity conservation. Very less human wildlife conflicts.

Weaknesses | Significant area of grasslands under exotic eucalyptus plantations. Ecodevelopment programme stagnating due to second generation problems. Buffer zone small and yet to be notified. Adjoining areas of land-

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All tiger reserves have an approved management plan but none of them have approved Tiger Conservation Plan. The present system of beat, section and range as unit of management, perhaps needs to be evaluated to see whether it is serving the twin purposes of protection and implementation of developmental programmes

scape yet to be brought under active wildlife management interventions. Shingotta gap- ongoing and proposed developments in the area. Inadequate systems of management of Sabarimala pilgrimage area.

Threats | Growing tourism rush and mushrooming of tourism infrastructure in Kumali town. Increasing pilgrims in Sabarimala and delay in implementation of already approved Master Plan. Existing water disputes between two states and proposed new Mullaperiyar dam. Emerging disease threat to wildlife from adjoining areas. Proposed developments in Periyar-Agasthyamalai landscape.

Opportunity | Growing interest of research institutions in the area. Support of tourism department. Wide possibilities of development of Periyar Foundation (both financially and academically).

PARAMBIKULAM

Strengths | Core area free from human population. TR has sound protection and is integrated into large landscape due to adjoining Annamalai TR and other divisions. Sound community support through ecodevelopment programme. Emerging model of community base ecotourism. Almost no human wildlife conflicts.

Weaknesses | Large area under exotic plantations. Inadequate trained staff. Monitoring systems yet to be strengthened. Inadequate incentives to attract and retain staff. Some disturbance due to reservoirs and settlements inside TR (Buffer zone).
Threats | Growing demand for a road through adjoining Kerala forests. Growing tourism rush. Possible water disputes between two states in future

Opportunity | Support of tourism department. Growing interest of research institutions in the area.

KALAKAD-MUNDANTHURAI

Strengths | Connectivity to the adjoining areas. Linking to Periyar Landscape. Strong support of local people, NGOs and other stakeholders. Good scientific research information base because of involvement of different institutions and individuals. Strong ecodevelopment programme in place to address the livelihood concerns of local dependent communities. Emerging area as a learning centre for community based protected area management.

Weaknesses | Human settlements inside. Inadequate number and no training of the frontline staff. Ecodevelopment programme still needs support of TR management to deal with emerging issues of linkages between conservation of TR and community livelihoods. Inadequate visitor facilities and material. Pilgrimage pressures due to a temple inside TR.

Threats | Increasing pressures of pilgrimage. Likely spread of tourism in the vicinity of TR. Upcoming projects around TR and private plantation areas. Possible pressures from interstate borders.

Opportunity | Sizable corpus available with communities. Recently established Tiger Foundation. Growing interest of research among institutions and individuals. Scope of growing awareness for conservation in the area.

ANNAMALAI

Strengths | TR part of large landscape covering a series of important habitats and rich flora and fauna with contiguity to Parambikulam TR and Chinnar WLS of Kerala, thereby providing space for migration of large mammals. Sound protection strategies in place. Adequate baseline information and support of research institutions. Adequate support of local people due to implementation of

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There are no adequate incentives or rewards for better performers and therefore the motivation level is not very high

Ecodevelopment programme for their livelihoods. Good coordination with adjoining state of Kerala.

Weaknesses | Core area still has human settlements which are proposed to be shifted out. Increasing Human Wildlife Conflicts in certain pockets. Poor component of staff training. Still some important corridors outside TR. Inadequate information and facilities for visitors. Invasive species in certain pockets particularly around Sholas.

Threats | Increasing conflicts with the local communities due to elephant depredation. Increasing rush of visitors and slow preparedness to deal with the situation. Possible spread of diseases from adjoining livestock.

Opportunity | Increasing support of government for biodiversity conservation. Increasing interest of researchers and other stakeholders in the area. Recently established TR foundation.

MUDUMALAI

Strengths | The tiger reserve is part of large landscape along with adjoining Bandipur Tiger Reserve and Wayanad WLS providing space for migration of large mammals and integrated into this ecosystem. The protection system is good and anti-poaching strategies are in place. The tiger reserve has good system to deal with human wildlife conflicts. This is a learning centre for Captive Elephant Management and their use in protection. There is good support of research institution which has generated adequate baseline information.

Weaknesses | There is still human habitation in side TR leading to biotic pressures in some pockets. Component of training of staff inadequate. Some corridors have been identified but these are yet to be acquired.

Tourism pressures due to increasing number of resorts/hotels in and around Masanagudy. Visitor facilities needs improvement. Weak livelihood support to the local communities through Ecodevelopment and their low level participation in tiger reserve protection.

Photos: S P Yadav

Threats | Increasing number of hotels around TR. Increasing conflicts with private hotels. Proposed developmental projects around the reserve.

Opportunity | Growing interests of research institutions. Newly created Tiger Research Foundation and support of government and other agencies for the tiger reserve.

TRAPPED

CAMERA TRAP PHOTOGRAPHS OF KALAKAD MUNDANTHURAI TIGER RESERVE

Situated in the south Western Ghats, the Kalakad Mundanthurai Tiger Reserve is bound by forests in west, north and south and by villages in the east. This is the only area of Western Ghats which has longest raining period of about 8 months,and it is the only non-dipterocarp evergreen forest in the region. The reserve is part of the Agasthyamalai Biosphere reserve

Protocol on monitoring

Phase IV: Continuous monitoring of tiger reserves and tiger source areas

S P Yadav

SECTION-1
The Tiger Task Force constituted by the National Board for Wildlife (2005) has endorsed the revised methodology propounded by the erstwhile Project Tiger Directorate (now the National Tiger Conservation Authority-NTCA) and the Wildlife Institute of India for country-level estimation/monitoring of tiger/prey status and its habitat. This includes a country-level assessment of tiger, co-predators, prey and habitat in 17 tiger states once in every four years; intensive monitoring of tiger source populations in TRs and protected areas in each tiger landscape complex (Phase-IV), and maintenance of a centralized photo-database of tigers at NTCA; routine management-oriented monitoring and survey design (for all tiger reserves except Sundarbans) for spatially explicit mark-recapture study involving research workers/scientists.

After a series of meetings, as per the decision taken, the minimum standards for Phase IV protocols were:-

- Camera trap density one pair per 4-5 sq km
- Minimum trap nights of 1000 per 100 sq km. (ie 25 pairs of cameras in 100 sq km for 40 days)
- Minimum area coverage of 400 sq km
- Closure period of 40-60 days
- Minimum of 20 spatial replicates of line transects each of a minimum of 2 km length (for entire reserve)
- Entire reserve needs to be sampled. Each sampling occasion should cover minimum 400 sq km (100 pairs of cameras) and in case of larger reserves, the area should be covered by dividing the area into 400 sq km blocks and camera trapping done successively, within the closure period of 60 days.

SECTION-2
MANAGEMENT-ORIENTED MONITORING (For all tiger reserves except Sundarbans)
Part-A | Maintaining daily patrolling log in patrolling camp/ chowki registers containing the following information:

- Each patrolling team shall be equipped with a GPS unit and a digital camera besides regular equipment (eg firearms, wireless, torch etc).
- Date, time and GPS coordinates of beginning of patrol recorded
- Preferably the GPS unit shall be switched on throughout the patrol in a track log mode. However, due to constraints of technical knowhow or other issues if this is not possible then a GPS coordinate recorded and written down in the record form every 30 min or at major deviations from a straight line path.
- Total number of persons on the patrol are recorded along with number of armed personnel and type of arms. The mode of patrol is also recorded, eg on foot, bicycle, motorcycle, 4WD, elephant, boat etc.
- Record of all illegal activities entered in data sheet along with time, date and coordinate stamp. A photo is also taken of the site with a time date stamp
- Record of signs and sightings or highly endangered species

while on patrol is also maintained by entering the GPS coordinate, date and time of the sighting/sign as well as recording a digital picture of the same if possible

- After the end of the patrol, the GPS track log is either downloaded onto a computer (in MSTrIPES program if this is applicable at the site) or the datasheet with the recorded information deposited at the range headquarters

PART B | Carrying out beat-wise monitoring of signs and encounters of animals/vegetation/habitat disturbances following Phase-I protocols twice a year

The entire tiger reserve would be covered at the beat level, by considering the latter as a sampling unit, as done in Phase-I of the country-level assessment by following the standardized eight day protocol. This would involve beat-wise collection of data (in the standardized formats) twice a year relating to tiger/carnivore signs survey, ungulate, encounter rates, habitat status, human presence and pellet/dung counts. Based on such data, beat level maps indicating spatial presence/relative abundance (index) of prey/predators species should be prepared in GIS domain for record.

(i) Beat-wise collection of data in the standardized formats of Phase-I country level assessment process.

(ii) Data collection should be done twice a year (summer and winter).

(If the tiger reserve is following advanced protocols as described in the next section in collaboration with scientific institutions, then the routine monitoring of prey animal signs/encounters, vegetation features and habitat disturbance features should be carried out along transect lines designed based on protocols described in Part-E of Section-3. There may be no need for laying of transect lines in each beat as per Phase-I protocol.)

Part-C | Recording data from 'pressure impression pads' (PIP) As part of intensive monitoring of source populations of tigers, data will be recorded from pressure impression pads (PIPs, track plots) in every beat.

A minimum of 5 PIPs will be permanently maintained in each beat. The dimension of the PIP shall not be less than 6m in length the width of the PIP should equal the foot path, jungle trail or dry nullah's width on which the PIP is made. GPS coordinates of all PIPs need to be recorded.

S P Yadav

The location of the PIPs within the beat should be such that they maximize the possibility of recording carnivore tracks. Minimum distance between any two PIPs should be more than 1.5km.

The PIPs should be cleaned of debris, leaf litter, gravel and covered with fine dust of about 0.5cm depth. After preparing the PIP, data should be recorded the next morning and the PIP cleared of all tracks.

The PIPs should be sampled thrice every month during summer and winter. In case a prepared PIP is disturbed due to rain, traffic etc, then it should be set again before data is collected. The topography and forest type should be recorded for each PIP.

Trails of all carnivore and mega herbivore species should be recorded eg tiger one track set, leopard two track sets, several dhole track sets (as it may not be possible to identify individual track sets due to many tracks by a passing dhole pack), one small cat track (as species-level identification may not be possible).

It is important to note that a track set is constituted by one to many pugmarks made by a single animal traversing the track plot (PIP). One need not identify the gender or individual animal (tiger), but if this information is known, it should be entered in the remarks column. If there are more than one track sets of "same" animal eg a tiger moving up and down the trail several times, they should be recorded as separate track sets.

Part-D | Obtaining the minimum number of tigers in the reserve

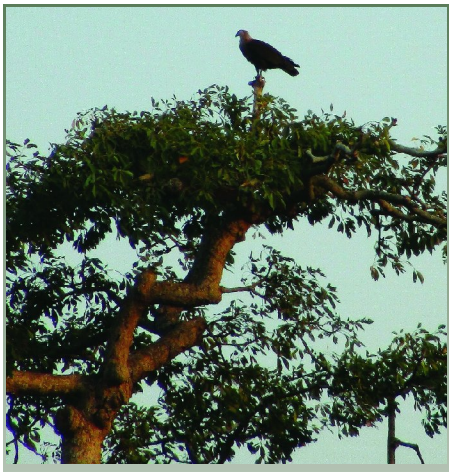
(i) Three pairs of camera traps to be deployed per beat and

should be left open within a closed period of 40-60 days depending on the reserve.
(ii) The period of leaving the camera traps open (closure period) is important owing to the fundamental assumption of "population closure" (no deaths/births/immigrations/emigrations in the population). Leaving the cameras open for longer duration will lead to overestimation of tiger numbers.
(iii) The photographs obtained from camera trapping should be submitted to NTCA for analysis for fixing individual IDs of tigers.
(iv) A digital camera trap tiger photo database should be prepared for the reserve with location ID, date and time stamps as per format to be provided by NTCA
(v) The minimum number of tigers should be ascertained based on individual camera photo traps of tigers obtained within the closure period specified to be 45-60 days
(vi) Details of new captures/ missing tigers should be recorded.
(vii) The format for recording the camera trap capture data will be provided by NTCA

SECTION-3
ADVANCED PROTOCOL INVOLVING SCIENTISTS
(Phase-IV intensive monitoring of source populations and tiger reserves)

Part-E | Obtaining tiger population size for the reserve using spatially-explicit capture recapture framework and obtaining prey population size using line transect sampling.
(a) Obtaining tiger population size.
(i) The camera traps deployed as per the survey design. Should be left open for a period of 40-60 days (depending on the areas). Where possible, the entire tiger reserve must be surveyed. If the survey area is very large, tiger population size can be obtained by sampling a minimum block of 400 sq km at a time, but following all other minimum standards in section 3. If deployment of camera traps in an entire reserve or parts of it is not feasible for any reason, fecal DNA samples may be collected over the entire tiger reserve for capture-recapture analysis. The tiger population size may then be estimated over the entire tiger reserve using mark-recapture methodology.

Photo: S P Yadav



The entire reserve would be covered at the beat level, by considering the latter as a sampling unit, as in Phase-I of the country level assessment by following the 8-day protocol

(ii) The analysis of data needs to be done in collaboration with a technical expert/scientist conversant with spatially-explicit capture-recapture process/analysis.
(iii) The period of leaving the camera traps open (closure period) is important owing to the fundamental assumption of "population closure" (no deaths/births/immigrations/emigrations in the population). Leaving the cameras open for longer duration may lead to over estimation.
(iv) The format for summary record of camera captures and the basics of mark recapture process using camera traps are provided.
(v) The analysis of capture data between years (using open population models) should also be done in collaboration with technical experts/scientists/WII.

(b) Obtaining prey densities
(i) Line transects must be systematically placed with a random start according to the survey design and implemented in program DISTANCE.
(ii) The line transect data should be analysed using the "DISTANCE" software for prey density. The analysis of the data needs to be done in collaboration with a technical expert/scientist conversant with the DISTANCE SAMPLING analysis.
(iii) The standard format for collecting line transect data to facilitate analysis using "DISTANCE" software and the basics of DISTANCE sampling using line transects are to be used.

Part-F | Using scats for DNA analysis to obtain the minimum tiger numbers in reserves where camera trapping is not possible

(i) Collection of scat samples:
(a) Use disposable surgical gloves to handle scat samples
(b) For each scat a new set of gloves should be used to avoid cross-contamination, used gloves should be discarded in an environmentally friendly way
(c) About 20g of fresh scat sample should be taken and stored in a vial/tube containing buffer and or 70% alcohol. Tubes should be prepared in duplicate with GPS coordinates and date clearly recorded on the tube (alcohol erases permanent marking pens).
(ii) Obtaining the minimum number of tigers in the area through DNA analysis of tiger scats involving an institution having the domain expertise.

Soldiers for the Tiger

SPECIAL TIGER PROTECTION FORCE IN BANDIPUR & NAGARHOLE

The National Tiger Conservation Authority, (NTCA) New Delhi during 2009-10 circulated the guidelines, memorandum of understanding etc for raising, arming and deploying the Special Tiger Protection Force.

Of the two options, the government of Karnataka after due deliberations resolved to raise the Special Tiger Protection Force for Bandipur and Nagarhole Tiger Reserves under Option-II. Accordingly, the government of Karnataka in a June 2011 order sanctioned 112 posts — one for assistant conservator of forests, three range forest officers, 18 foresters, 63 forest guards and 27 forest watchers. The recruitment of 14 foresters and 40 forest guards has been completed.

The 54 personnel of this elite force have undergone induction forestry training and the 13-week training module as prescribed by NTCA. Recruitment for the remaining vacancies in the cadre of foresters, forest guards and forest watchers is under way. The three platoons each headed by a range forest officer will be deployed at Melukamanahalli (Bandipur), Hand Post, H. D. Kote (between Bandipur and Nagarhole) and Thithimathi (Nagarhole) being the platoon headquarters. The company headed by the assistant conservator of forests is headquartered at Hand Post, H. D. Kote.

First stocktaking conference to review implementation of

GLOBAL TIGER RECOVERY PROGRAM

MAY 15-17, 2012
VIGYAN BHAVAN CONFERENCE CENTER, NEW DELHI, INDIA

Hosted by the National Tiger Conservation Authority, Ministry of Environment and Forests, Government of India
&
Co-organized and co-sponsored by the Global Tiger Initiative (GTI) and its partners, Global Tiger Forum (GTF), and the World Bank

ALL EVENTS ARE FOR REGISTERED PARTICIPANTS ONLY.
ALL EVENTS ARE AT VIGYAN BHAVAN, HALL NO. 5.
WORKING LANGUAGE IS ENGLISH

The St. Petersburg Declaration on Tiger Conservation and the Global Tiger Recovery Program (GTRP) adopted at the International Tiger Forum in Russia, November 2010, call for convening regular high-level meetings to review the implementation progress of the GTRP and its national priorities (NTRPs). While the first Asia Ministerial Conference on Tiger Conservation (AMC), held in Hua Hin, Thailand, in January 2010, played its critical role in preparations for the International Tiger Forum in Russia, the second AMC, to be held in the second half of 2012, is expected to help ensure continued high-level political commitment to tiger recovery. Representatives and specialists from other government sectors, including law enforcement, infrastructure, and donor agencies, will join conservationists to deepen support to the line agencies in TRCs. A Stocktaking Meeting of Senior Officials and Experts will complete the work necessary for a review of GTRP implementation progress and preparation for the Ministerial-level decisions of the second AMC.

OBJECTIVES

- *Take stock of progress made in the implementation of the GTRP by tiger reserve countries and their partners, including adoption of the draft GTRP Annual Implementation Report 2011*
- *Announce National Priority Implementation Activities 2012, discuss plans forward*
- *Deepen engagement in several critical areas*
- *Raise funds for GTRP Implementation*
- *Address threats to tiger habitats; smart green infrastructure*
- *Combat illegal trade and poaching*
- *Eliminate demand for tiger products*
- *Strengthen national monitoring systems*

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