

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

s t r i p e s

Volume 1 Issue 1

Nov-Dec 2009



LANDMARKS



STRATEGIES

CHALLENGES



ACHIEVEMENTS

PERSPECTIVES



INITIATIVES

**Shivalik-Gangetic Plain Landscape Complex**

Area 5177 sq km ■ Tigers 297 (259-335)

Uttarakhand — **Corbett** (822 sq km)

Total tiger Area 1901 sq km Tiger number 178 (161-195)

Uttar Pradesh — **Dudhwa** (1133.8 sq km after **Katerniaghat** extension)

Total tiger Area 2766 sq km Tiger number 109 (91-127)

Bihar — **Valmiki** (840 sq km)

Total tiger Area 510 sq km Tiger number 10 (7-13)

**Central Indian and Eastern Ghats Landscape Complex**

Area 48610 sq km ■ Tigers 601 (486-718)

Andhra Pradesh — **Nagarjunasagar** (2527 sq km)

Total tiger Area 14126 sq km Tiger number 95 (84-107)

Chhattisgarh — **Indrawati** (1258.4 sq km), **Achanakamar** (626.2 sq km), **Udanti-Sitanadi** (851.1 sq km)

Total tiger Area 3609 sq km Tiger number 26 (23-28)

Madhya Pradesh — **Pench** (411.3 sq km), **Kanha** (917.4 sq km), **Satpura** (1339.3 sq km), **Bandhavgarh**

(716.9 sq km), **Panna** (576.1 sq km), **Sanjay Dubri** (831.3 sq km)

Total tiger Area 15614 sq km Tiger number 300 (236-364)

Maharashtra — **Pench** (257.3 sq km), **Melghat** (1500.5 sq km), **Tadoba-Andhari** (625.8 sq km)

Total tiger Area 4273 sq km Tiger number 103 (76-131)

Orissa — **Simlipal** (1194.8 sq km), **Satkosia** (523.6 sq km)

Total tiger Area 9144 sq km Tiger number 45 (37-53)

Rajasthan — **Sariska** (681.1 sq km), **Ranthambhore** (1113.7 sq km)

Total tiger Area 356 sq km Tiger number 32 (30-35)

Jharkhand<sup>¶</sup> — **Palamau** (414.1 sq km) Total tiger area 1488 sq km, tiger number **Not Assessed**

**Western Ghats Landscape Complex**

Area 34094 sq km ■ Tigers 412 (336-487)

Karnataka — **Bhadra** (492.5 sq km), **Bandipur** (872.2 sq km), **Dandeli-Anshi** (814.9 sq km),

**Nagarhole** (643.4 sq km)

Total tiger Area 18715 sq km Tiger number 290 (241-339)

Kerala — **Periyar** (881 sq km), **Parambikulam** (235 sq km)

Total tiger Area 6168 sq km Tiger number 46 (39-53)

Tamil Nadu — **Kalakad Mundanthurai** (895 sq km), **Anamalai** (958 sq km), **Mudumalai** (321 sq km)

Total tiger Area 9211 sq km Tiger number 76 (56-95)

**North East Hills and Brahmaputra Flood Plains**

Area 4230 sq km ■ Tigers 100 (84-118)

Assam<sup>♦</sup> — **Manas** (840 sq km), **Nameri** (200 sq km), **Kaziranga** (625.8 sq km)

Total tiger Area 1164 sq km Tiger number 70 (60-80)

Arunachal Pradesh<sup>♦</sup> — **Namdapha** (1807.8 sq km), **Pakke** (683.5 sq km)

Total tiger Area 1685 sq km Tiger number 14 (12-18)

Mizoram<sup>♦</sup> — **Dampha** (500 sq km)

Total tiger Area 785 sq km Tiger number 6 (4-8)

Northern West Bengal<sup>♦</sup> — **Buxa** (390.6 sq km)

Total tiger Area 596 sq km Tiger number 10 (8-12)

**Sunderbans (WB)**

Area 1699.6 sq km ■ Tiger number **Not Assessed**

**INDIA**

Tiger Area 93,697 sq km

Reserve Area 32050 sq km

Tiger Population 1411 (1165-1657)

<sup>♦</sup> Population estimates are based on possible density of tiger occupied landscape in the area, not assessed by double sampling.

<sup>¶</sup> Data was not amenable to population estimation of tiger. However, available information about the landscape indicates low densities of tiger in the area ranging from 0.5 to 1.5 per 100 sq km.

Expenditure during IX plan Rs 73.18 crore

Expenditure during X plan Rs 161.92 crore

Allocation during XI plan Rs 650 crore



**Landmarks**

The most ambitious conservation project ever  
Pg 6

**Volume 1  
Issue 1  
Nov-Dec  
2009**



**Thoughts**

Jairam  
Ramesh  
Pg 5

**Strategy**  
Conservation  
demands  
proper buffer  
management  
Pg12



**Focus**  
A scientific  
protocol for  
effective  
monitoring  
Pg14



**Initiatives**  
Three years  
of NTCA  
Pg 16

**First Person**  
Fateh Singh  
Rathore  
P18

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BI-MONTHLY OUTREACH JOURNAL OF NATIONAL TIGER CONSERVATION AUTHORITY

GOVERNMENT OF INDIA

s t r i p e s

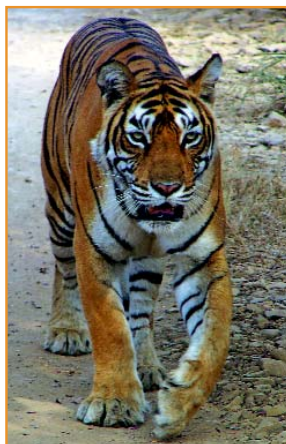
n o t e f r o m t h e e d i t o r



INDIA is one of the thirteen tiger range countries having the maximum number of wild tigers. Launched in the early Seventies, Project Tiger has put the endangered tiger on a definite path of recovery. As far as the scale of implementation and the diverse habitats under its coverage are concerned, the project has no parallel in the contemporary world.

The recent All India Tiger Estimation using the refined methodology has highlighted that the source populations of tiger are present in designated tiger reserves. These require active hand-holding through managerial interventions. The status of tiger in other areas is poor to very poor, which is cause for great concern.

Loss of habitat, poaching fostered by an ugly interna-

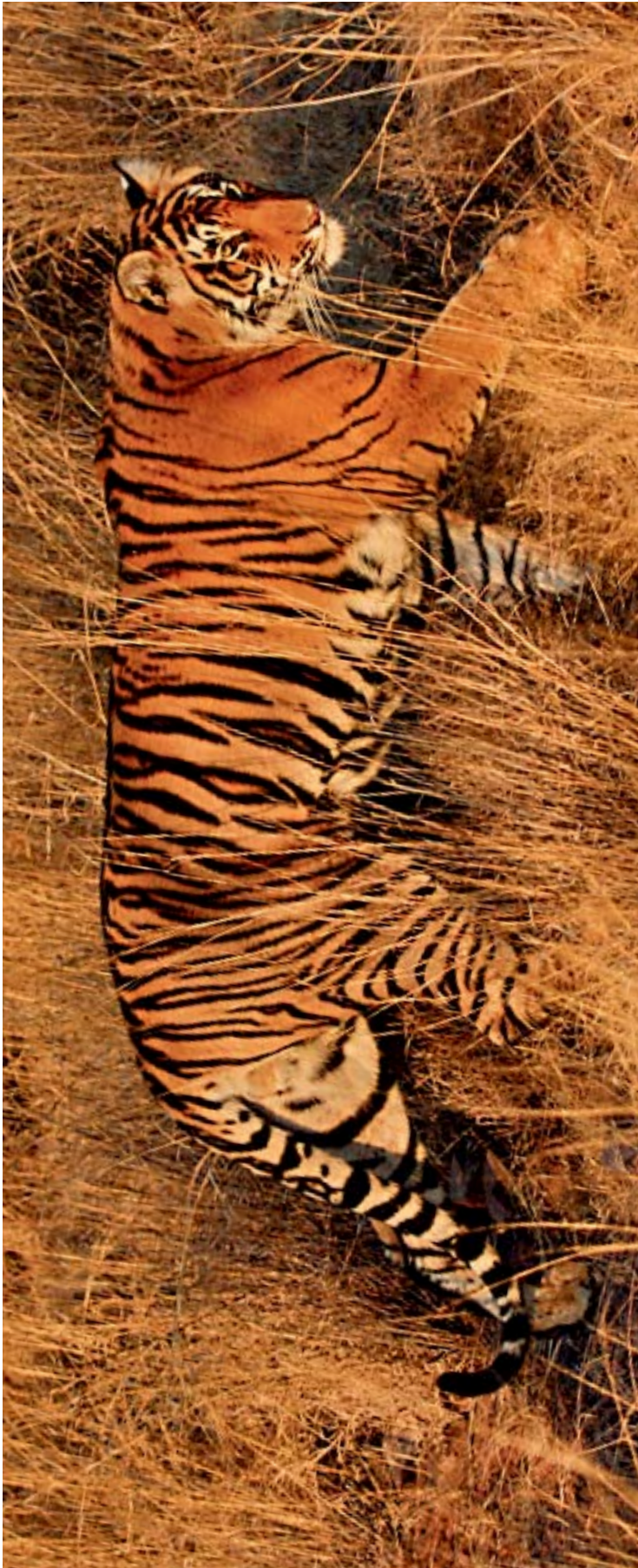


ional illegal market demand, ecologically unsustainable land uses in tiger landscapes, loss of connectivity between source areas and ever increasing demand on our forests continue to challenge the efforts to save the tiger.

While our attempts to control poaching and ensure a secure, inviolate home for tigers is a priority, an equally daunting task is to factor in the interests of the tiger in different sectors where tiger conservation is not the goal.

Tiger conservation is a collective responsibility between the Centre, states and civil society institutions. We look forward to the active support of one and all for saving our wild tigers.

**Dr Rajesh Gopal**  
Member-Secretary, NTCA



# RECENT INITIATIVES

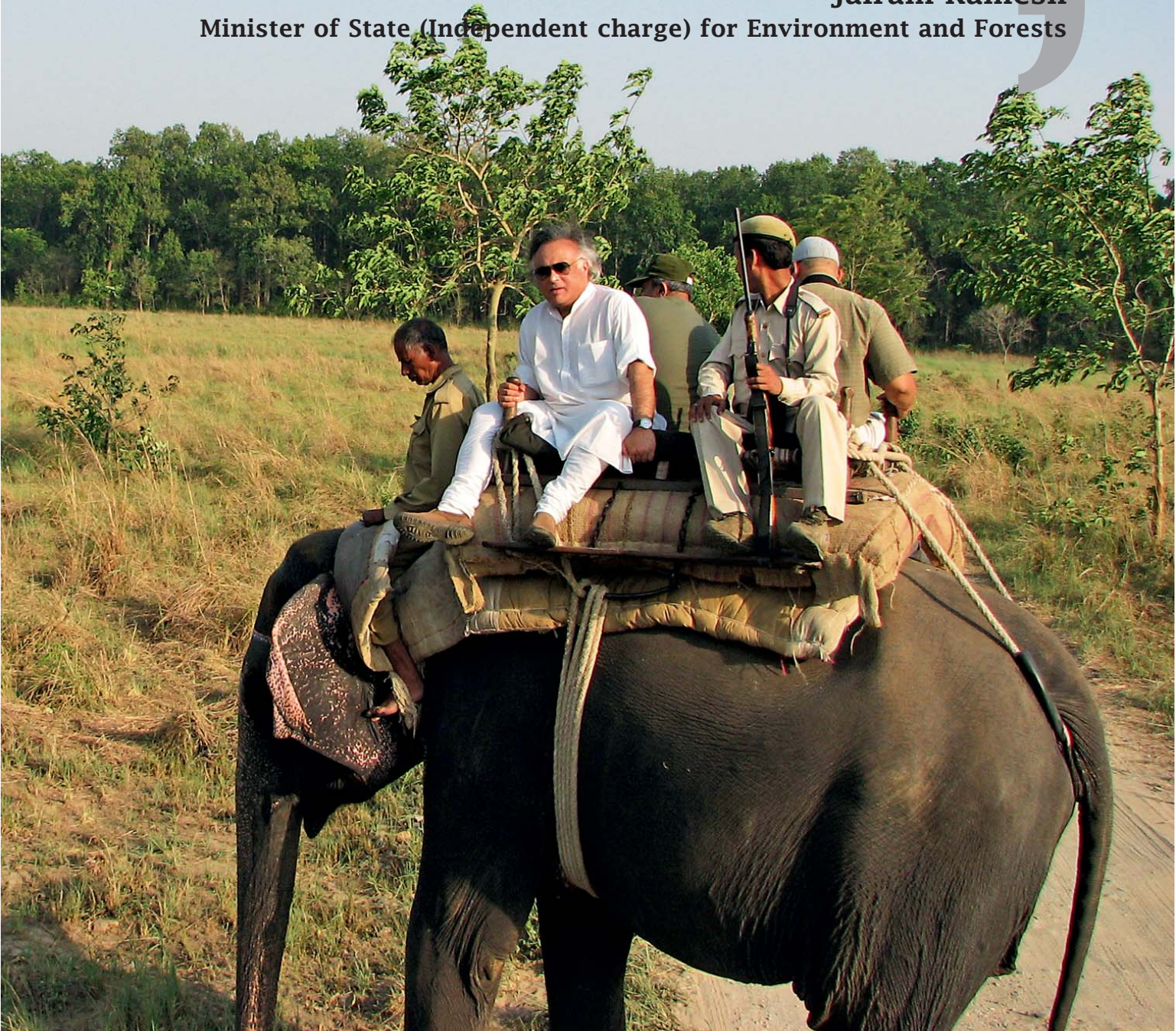
## NATIONAL TIGER CONSERVATION AUTHORITY

- ✧ Implementing a tripartite MOU with tiger states, linked to fund flows for effective implementation of tiger conservation initiatives
- ✧ **Revising Special Tiger Protection Force norms to involve local people like Van Gujjars in field protection**
- ✧ Rapid assessment of tiger reserves done (12 good, 9 satisfactory and 16 poor)
- ✧ **Special crack teams sent to tiger reserves affected by left wing extremism and low population status of tiger and its prey**
- ✧ All India meeting of field directors convened on 25 and 26 July, 2009 under the chairmanship of the Minister for Environment and Forests for reviewing the status of field protection and related issues in tiger reserves
- ✧ **Chief Ministers of tiger states addressed at the level of the Minister for Environment and Forests on urgent issues, implementation of tripartite MOU, creation of Tiger Conservation Foundation, stepping up protection etc**
- ✧ Chief Ministers of states having tiger reserves affected by left wing extremism and low population status of tiger and its prey addressed for taking special initiatives
- ✧ **Field visits to Bhadra, Corbett (*photo on facing page*), Sariska and Ranthambhore made by the Minister for Environment and Forests to review the initiatives and problems relating to tiger conservation**
- ✧ Steps taken for modernising infrastructure and field protection
- ✧ **Advisory issued for involvement of non-governmental experts in the forthcoming all India tiger estimation**
- ✧ Core Committee involving outside experts constituted for overseeing the forthcoming all India tiger estimation
- ✧ **Report of Special Investigation Team, constituted for looking into the local extinction of tigers in the Panna Tiger Reserve, sent to Madhya Pradesh for action**
- ✧ Issue of tiger farming and trafficking of tiger body parts discussed at the level of Minister for Environment and Forests with the Chinese authorities
- ✧ **Initiatives taken for improving the field delivery through capacity building of field officials**
- ✧ Decision taken to host the World Tiger Summit in October-November, 2010

*...Undoubtedly, Indira Gandhi was a visionary when it came to environmental issues. The extensive legislation that is in place today on environment and forests is almost entirely because of her personal initiatives and leadership. Project Tiger was launched in April 1973. If India has substantial forests remaining today, it is entirely because of the Forest Conservation Act of 1980 that she spearheaded...*

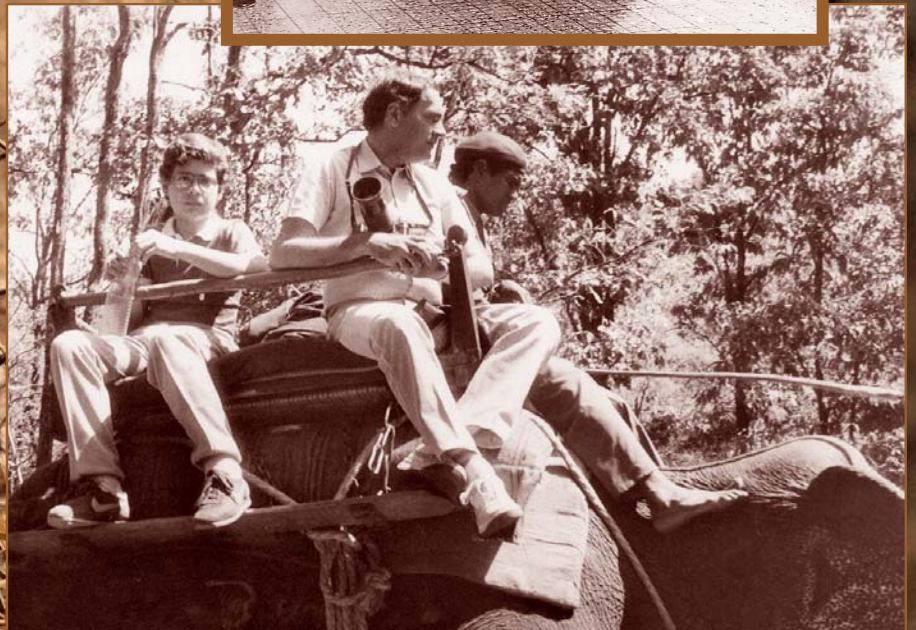
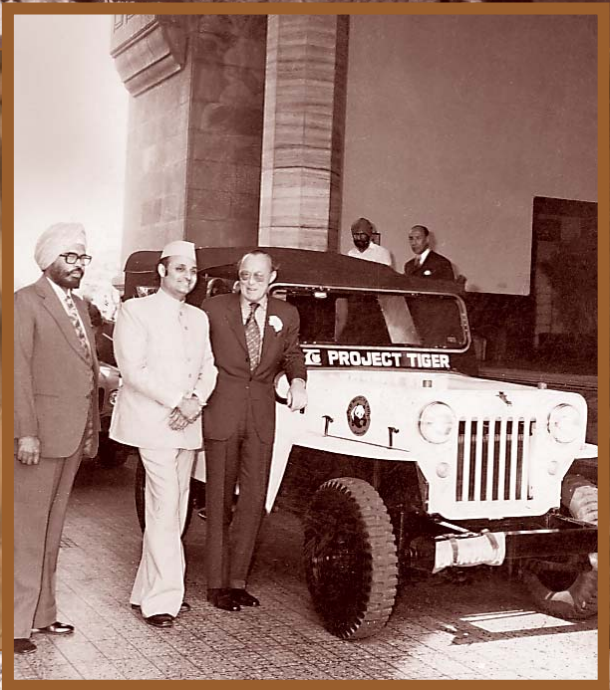
**Jairam Ramesh**

**Minister of State (Independent charge) for Environment and Forests**



*Jairam Ramesh during a field visit to Corbett Tiger Reserve in 2009*

# PROJECT TIGER



# milestones

The world's most ambitious conservation project ever

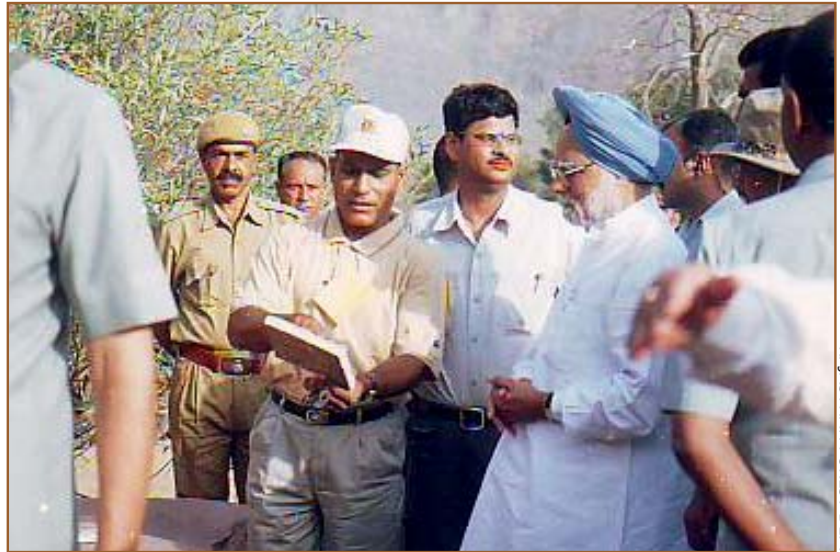
**A**DMIRED and feared alike across the world, the tiger has captured the imagination of millions down the centuries. In India, though worshipped in temples, the tiger has been the most prized trophy for the royalty and the powerful. To the 'sportsman' of yore, the tiger stood for India's wilderness. The awe and the beastly mystery surrounding this 'phantom of the forest' provided adventure, thrill and, of course, led to amazing shikar exploits.

An estimate placed the population of tigers in India at the turn of the century at 40,000. The first-ever All India Tiger Census in 1972, however, revealed that only 1,827 survived. Even if the earlier figure was an exaggeration, the 1972 figure projected a dismal picture.

There was more than hunting behind the tiger's sinking fortune. Mounting demographic pressure gathering momentum towards the latter part of the last century, led to progressive diversion of wilderness to agriculture. A perverse lust for shikar among

*(Top left) Then Prime Minister Indira Gandhi with Kailash Sankhala, the founder director of Project Tiger; (centre) Dr Karan Singh during an international workshop in New Delhi; (left) Then Prime Minister Rajiv Gandhi during a field visit to Kanha Tiger Reserve in Madhya Pradesh*

*Archive courtesy: Ravi Singh/WWF-India, Madhya Pradesh Forest department and Project Tiger Directorate  
Background photo: Dharm Khandal*



RAJASTHAN FOREST DEPT

*Prime Minister Dr Manmohan Singh during a field visit to Rajasthan's Ranthambhore Tiger Reserve in 2005*

Post-Independence, rural pressure of small timber, firewood and grazing was directed at reserved forests. Hunting pressures from villages and cities, legal and illegal, went up, depleting the prey base of the tiger

the privileged hunters took a heavy toll on wild animals. The totalitarian controls of the colonial-feudal era, nonetheless, prevented the masses from such indulgence.

Post-Independence, even these controls crumbled. Private forests and village pastures were rapidly

reclaimed for agriculture, directing rural pressure of small timber, firewood and grazing to hitherto sparingly utilised reserved forests. Hunting pressures both from villages and cities, legal and illegal, went up, depleting the prey base of the tiger.

As prey became scarce, the carnivores turned to killing cattle. In retaliation, the villagers poisoned the carnivores. Such shrinkage and depletion of the wilderness coupled with direct elimination pressures caused all wild animal populations, including the tiger, to dwindle.

At the IUCN General Assembly in Delhi, in 1969, anxiety was voiced about the threat to several rare species and wilderness areas in India. Things began to move thereafter because of an intensi-



*Hunting was banned in 1972. Till then, the tiger was the most sought after game of the rich and the powerful*

fyng concern, spearheaded by the Indian Board for Wildlife.

The IUCN offered to draft plans for scientific management and research if India were to support them and create special reserves. The WWF offered equipment worth \$10,00,000 so that the reserves could meet the highest standards.

The year 1970 will be regarded as the cut-off year in the history of conservation in India. Wildlife had reached its lowest ebb by then, and the full implications of this devastation began to be felt. In 1970, a national ban on tiger hunting was clamped and in 1972 the Wildlife (Protection) Act came into force.

The Tiger Task Force was appointed under the chairmanship of Dr Karan Singh, then minister for tourism and civil aviation. Project Tiger was launched in 1973, and this concern and the direction were reflected in the message for the occasion from Prime Minister Indira Gandhi who

regarded it as a truly national endeavour: "The tiger cannot be preserved in isolation. It is at the apex of a large and complex biotope. Its habitat, threatened by human intrusion, commercial forestry and cattle grazing, must first be made inviolate."

The architects of Project Tiger, a special task force of the Indian Board for Wildlife, conscious of this, thus enunciated its objective: "To ensure maintenance of a viable population of tiger in India and to preserve, for all time, areas of biological importance as a national heritage for the benefit, education and enjoyment of the people."

A six-year plan involving an outlay of no less than \$5,900,000 was approved by the government. Field work for soil and water conservation and for habitat restoration commenced simultaneously. The effort was initially supported with vehicles, boats, wireless sets and other equipment received through WWF assistance. Subsequently, it became a fully national endeavour with no external financial support. Technically, it remained a religiously guarded Indian venture at all states — conception, formulation and implementation.

In its report, the first Tiger Task Force observed: "To maintain a genetically viable population of tigers, a considerably large number of tigers would be required than the reserves and their contiguous forests can presently carry... it is necessary to increase the tiger population to optimum levels by the improvement of the biotope and stimulation of its diversity, according to sound principles of conservation. This situation will, in addition, provide a breeding nucleus from

## TIGER PEOPLE

**Karan Singh**

**H M Patel**

**Peter Scott**

**Paul Leyhanson**

**Zafar Futehally**

**Dilip Mathai**

**Anne Wright**

**M Krishnan**

**Billy Arjan Singh**

**Brijendra Singh**

**Fateh Singh Rao Gaekwad**

**M K Ranjit Singh**

**Peter Jackson**

**Samar Singh**

**S Deb Roy**

**Fateh Singh Rathore**

**Bittu Sehgal**

**Valmik Thapar**

**Ullas Karanth**

**Usha Rai**

**Ashok Kumar**

**Belinda Wright**

**Ravi Singh**

**Kailash Sankhala**

1973 - 1977

**B R Koppikar**

1977 - 1981

**R L Singh**

1985 - 1991

**H S Panwar**

1981 - 1985



which surplus animals can migrate to surrounding forests.”

This focus on the flagship species was, in effect, meant to cover the entire ecological pyramid the tiger represented. From the cold Himalayan high altitude forests to the steaming coastal mangroves of the Sunderbans, from the scorched arid scrublands of Rajasthan to the lush evergreens of the south and the north-east, and from the flat terai swamps to the rolling hard grounds of the peninsula, the tiger is very much at home. The well-being of the tiger was, and

dled across its natural habitats in the neighbouring countries, the Project ensured that most of the source populations in India were intact.

Over more than three decades, Project Tiger has witnessed a number of milestones. From nine tiger reserves in 1973, it expanded to 37 tiger reserves in 2009. The project drew strength from the International Symposium on Tiger Conservation and the first International Wildlife Workshop in its early days. In the early Eighties, it undertook a path-breaking radio-telemetry study.

RAJASTHAN FOREST DEPT



Rajasthan Forest officials and scientists from Wildlife Institute of India prepare to release the first tiger — a male — airlifted from Ranthambhore to repopulate Sariska in June 2008

still is, synonymous with the health of the Indian wilderness.

Given the biotic pressure, however, many had predicted the tiger would be extinct by the turn of the 20th century. Since its inception, Project Tiger has proved doomsayers wrong. While wild tiger numbers dwin-

Over the years, the Project envisioned a core-buffer strategy. While the core area of a tiger reserve is managed for wildlife conservation, the buffer is treated as a multiple use zone to provide vegetal connectivity for spillover population of wild animals from the core conservation

Arin Ghosh

1991 - 1996

Rajesh Gopal

2001 onwards

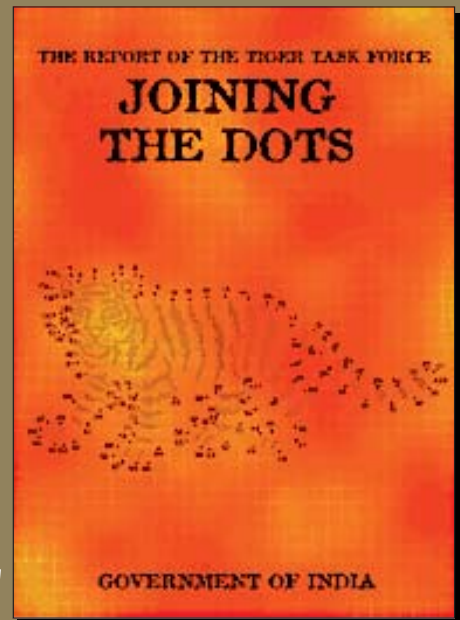
P K Sen

1996 - 2001

Courtesy: The Indian Express



Sariska was a great tragedy. It was also a great opportunity for reforms. The Prime Minister set up the Tiger Task Force and its report led to the strengthening of the Wildlife Protection Act (1972) and creation of two Central agencies





Over four decades, Project Tiger's biggest success has been the protection of a number of source populations in different landscapes across the country. With effective field management and conducive land use policies, these source populations will ensure that wild tigers never go extinct in India



NANAK DHINGRA

unit. In addition, the buffer zone also facilitates implementation of site-specific eco-developmental inputs for eliciting the support of stakeholder indigenous people towards tiger conservation.

In spite of its stellar record, the Project faced periodic crises. In the early 90s, a poaching spree had threatened to undermine the Project. The spectre returned in 2005 when the Project suffered its biggest tragedy with a tiger

reserve (Sariska) losing all its tigers in Rajasthan. Another tiger reserve, Panna in Madhya Pradesh, has since suffered the misfortune of local extinction of tigers.

Considering the urgency of the situation, Project Tiger has been converted into a statutory authority — National Tiger Conservation Authority — by providing enabling provisions in the Wild Life (Protection) Act, 1972 through an amendment in 2006. Objectives of NTCA is to

provide statutory authority to Project Tiger so that compliance of its directives becomes legal.

In the face of pressing challenges of surging human population and pressure on forest land, the Project's biggest success has been to secure several source populations of tigers. In its new avatar as NTCA, the Project strives to streamline scientific modules of conservation and co-opt communities as responsible stakeholders.

## ACHIEVEMENTS

- Project Tiger has saved the endangered tiger from extinction, and has put the species on an assured path of recovery by improving the protection and status of its habitat.
- The Project coverage has been increased from 9 tiger reserves in 1973 to 38 tiger reserves at present. Further, approval has been accorded for designating 4 more tiger reserves, based on proposals received from states.
- The core buffer strategy of Project Tiger has provided scope for eliciting local public support through site specific ecodevelopment in the buffer/fringe areas.
- The Project has contributed towards several intangible environmental benefits to society, such as absorption of carbon dioxide, improvement of micro climate, rainfall and river flow.
- The Project has generated considerable wages for the benefit of fringe dwelling communities, who are deployed as local work force for protection.
- While conserving the flagship species, the Project has saved several other species of plants and animals from extinction.
- The local communities are benefiting from eco-tourism apart from ecodevelopmental inputs in fringe areas.
- The Project has served as a role model for wildlife management planning, habitat restoration, protection and ecodevelopment. States have been provided funding support for enhancing protection through deployment of local work force, ex-army personnel. The field staff have been provided allowance as an incentive for working in difficult conditions.
- Independent monitoring of tiger reserves has been undertaken by a panel of experts, based on the framework of the World Commission of Protected Areas of the International Union for Conservation of Nature and Natural



# Three decades of Project Tiger

## Central funding

■ The Government of India provides 100 per cent funding support for non-recurring items of expenditure, and 50 per cent funding support for recurring items, based on annual proposals received from states to implement the Tiger Reserve specific management plan for tiger conservation. An amount of Rs 288.34 crore has been provided as Central assistance since the inception of Project Tiger (1973-74 to 2006-07).



Resources (IUCN).

- The All India Estimation of tiger, co-predators and prey animals has been refined by Project Tiger in collaboration with the Wildlife Institute of India, with a peer review mechanism comprising independent experts, both national and international (IUCN).
- The tiger habitat of the country has been evaluated in the GIS (Geographical Information System) domain at the tehsil level. The status and changes of forest cover within tiger reserves upto an outer surround of 10 km radius distance has been assessed in collaboration with the Forest Survey of India, for facilitating restorative action.
- The Zoological Survey of India and the Botanical Survey of India have been co-opted for bringing out compendia on faunistic and floristic surveys in tiger reserves.
- In a pilot e-governance initiative, five tiger reserves have been linked with the Project Tiger Directorate in the GIS domain.

Without forest buffers and connectivity, our reserves will remain islands of conservation, pushing fringe tigers to death, stagnating gene pools, and fuelling man-animal conflict

**Text:** Jay Mazoomdaar  
**Graphic:** Ananda Banerjee

these sub-adults (known as floaters) do not easily find space unclaimed by adult tigers.

At this stage, a floater may kill or chase away a resident tiger or get killed or chased away. If alive, the displaced weakling or the young floater moves towards the forest periphery and may circle the forest till it gets lucky and finds a slot. Otherwise, it may find a patch that connects its native forest to an adjoining forest where it may try to shift. If there is no peripheral forest (known as buffer) or connecting patches (known as corridors) to temporarily accommodate these displaced weaklings or

young floaters, the animals end up running into people. Such encounters usually trigger conflict and the animals are eventually killed or captured and sent to zoos.

(A zoo tiger may sound better than a dead tiger, but in terms of ecological loss, both amount to one tiger less in the wild.)

As our forests get increasingly fragmented, face-offs between humans and tigers become more frequent. What is worse, our handling of conflict has always been *ad hoc*, determined by assumptions, media hype and public pressure. Be it in Sunderbans, Corbett or Tadoba, the picture does not change.

# Buffer is the core issue

**T**HE latest national census conducted by Project Tiger using refined methodology showed that tigers are doing well inside most of our reserves, but have gone down in numbers outside Project areas.

This gives us some serious food for thought. While it reflects on the success of Project Tiger in saving a few source population within reserves, it also tells us why our tigers will eventually be doomed even inside our better protected reserves if we fail to restore forest buffers and connectivity.

The tiger is a territorial animal. The larger territory of a male overlaps with several smaller territories of females. But no two adult males or females usually share space.

If they are lucky to survive their first two years, tiger cubs leave their mothers and go looking for their own territories. However,



SURESH SINGH/Courtesy WWF-India

*A young male tiger killed by poachers in the buffer of Corbett Tiger Reserve on the banks of Dhela river in September 2006. The poachers intended to hunt wild boars and accidentally ran into the tiger*

Thankfully, the National Tiger Conservation Authority has come up with a scientific protocol to guide state forest departments in handling conflict situations. One expects that the protocol will be updated over time to accommodate the latest scientific inputs available from the field.

In the short-term, simple steps — like monitoring animals to ascertain if an attack is accidental or follows a deliberate pattern, effective people management to allow safe passage to animals caught in the middle of a crowd etc — can minimise cases of animal and human mortality.

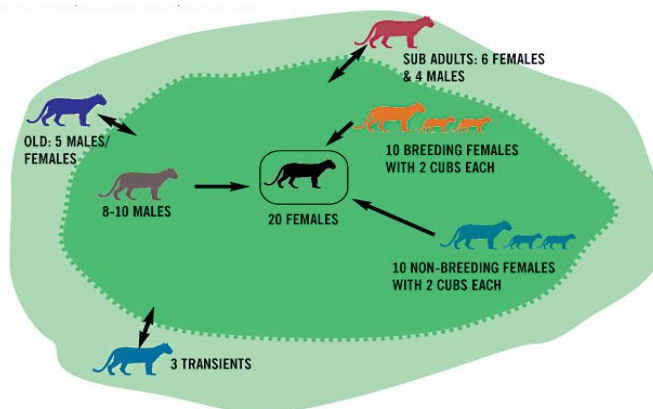
In the long-term, however, we need to take a hard look at land use patterns around our forests if we are serious about creating space for feasible co-existence.

In natural circumstances, dispersal and deaths maintain the balance in a tiger population. But external disturbances such as mining or highways or habitation inside a forest reduces the size of the prime habitat (known as core area) and pushes too many tigers towards the buffer.

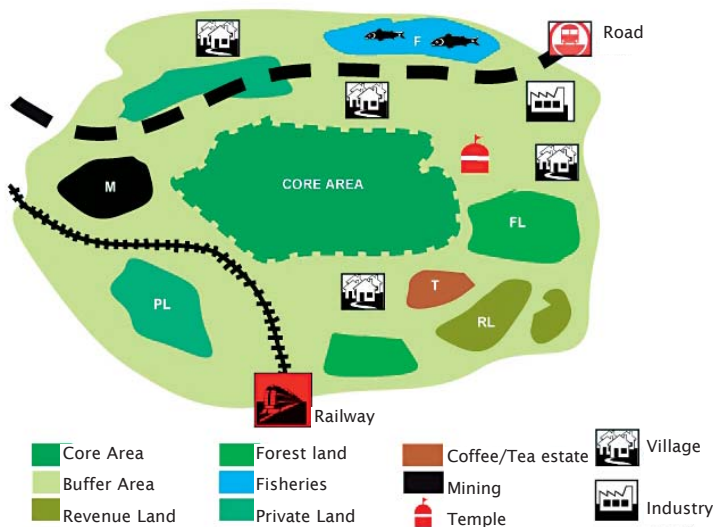
These dispersed tigers are doomed if we allow agriculture, resorts and other human activities right at the edge of the forest, if we cram the animals for space and push them into conflict, if we confine them to small fragmented forests in small numbers and make the gene pool stagnate. Over time, this combination of a disturbed core, a non-existent buffer and no connectivity between forests makes a tiger population locally unsustainable.

Almost all tiger states have already notified the core critical areas. The next big test lies in institutionalising buffer management and restoration of corridors. That is the only way forward for NTCA to realise the full potential of its landscape approach.

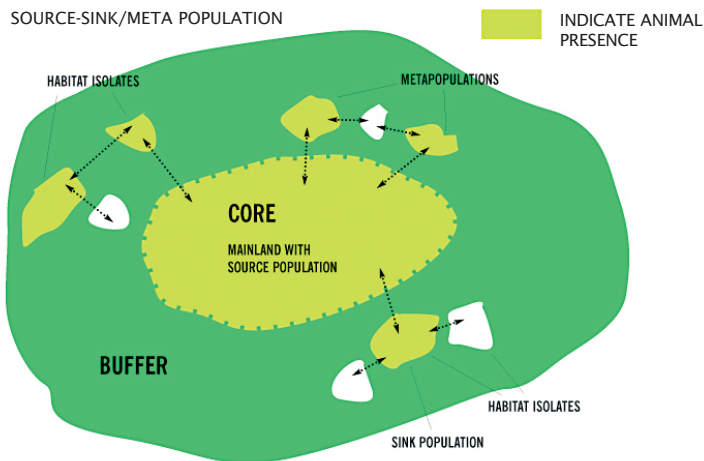
*Mazoomdaar and Banerjee are conservation journalists*



*Minimum population in breeding age needed for a viability (80-100) which requires 800-1000 sq km of habitat*



*Land use dynamics around a tiger habitat*



*Source-sink dynamics in a tiger population*

# A scientific protocol for effective monitoring

Monitoring tigers is a process, the end product of which is not the number of tigers but an indication that there has been a change in number of tigers, says **Dr Rajesh Gopal**



DHARM KHANDAL

**T**HOUGH there is no escaping from the number game, there are more important questions that beg answers from the point of view of tiger conservation.

These are: What are the trends in the tiger population, in the country as a whole, at the landscape level, and within tiger reserves? Where have tigers gone locally extinct and which new areas have they colonised? What is the quality of the habitat, prey availability, and other characteristics of these areas? Where are the source populations of tigers located? What kind and quality of habitat contiguity exists between these source populations? Which mortality factors operate in sink and source areas of tiger populations? How often do tigers move between these populations?

Answers to these questions are vital for planning land use, forming policy, and implementing conservation management for tigers and their habitats. However, with the exceptions of some tiger reserves, answers to the above were hard to find.

Monitoring tigers is a process, the end product of which is not the number of tigers but an indication that there has been a change in the number of tigers, with an under-

standing of the factors that have been responsible for this change. We wanted to devise a methodology for detecting this change, establishing its direction, and measuring its extent and intensity.

There has been considerable amount of field data recording of wildlife especially in protected areas in the past three decades. But for lack of uniform data collection methodology and information on survey effort, more often than not, it becomes difficult to make comparisons or draw inferences from such data.

There is no substitute for an objective-oriented, well-designed, monitoring program. Though indi-

**For lack of uniform data collection methodology and information on survey effort, more often than not, it becomes difficult to make comparisons or draw inferences from such data**

vidual scientists, ecologists, and scientific organizations may develop effective monitoring schemes for individual tiger reserves, or tiger population estimation methods, these would serve only an academic purpose and contribute little to tiger conservation unless

they become institutionalized within the system responsible for implementing tiger conservation. Institutionalisation of these protocols and monitoring designs is currently possible only when the Forest Department is a major stakeholder in implementing these protocols.

## MONITORING TIGER STATUS AND HABITAT

बाघ की स्थिति एवं वासस्थल का अनुश्रवण

A FIELD GUIDE

फील्ड गाईड



The latest assessment using refined methodology highlights the achievement of Project Tiger by showing that viable tiger population exists only in Project Tiger areas, while outside populations are highly depleted

multiple regression density model was developed.

The multiple regression equation developed for density estimation was run on the entire unknown grids for obtaining density estimates of all grids showing tiger presence (except grids having disagreement between logistic prediction and departmental value).

Tiger densities were then predicted using regression equation developed at 100 sq km resolution. Tiger densities were averaged for grids with contiguous tiger habitat (forest patches separated by less than 5 km on non-forest were considered contiguous). This average density was multiplied by the area of the contiguous landscape to arrive at the tiger population estimation of that landscape unit. Separate population of tigers were then added to arrive at a total figure within a landscape unit and states.

As revealed by the latest findings of the All India Tiger Estimation using this refined methodology, Project Tiger has put the endangered tiger on an assured path of recovery by saving it from extinction. The total country-level population of tiger is 1411 (mid value); the lower and upper limits being

So we needed a simple, field-friendly, protocol that required minimal technical skill for collecting data that would meet the scientific rigour for analysis and appropriate inferences. Thus, *National Tiger Habitat and Population Evaluation System* took shape, with Wildlife Institute of India and two young scientists, Dr YB Jhala and Dr Qamar Qureishi.

In this system, the entire landscape was sampled at beat level (on an average around 20 sq km) for tiger sign indices, ungulate abundance indices and human disturbances. A sub-sample (5% of the tiger occupied landscape in 29 sites) of the landscape was again sampled for absolute density of tiger. This constituted the *double sampling* approach. The indices were then calibrated (regression) against absolute densities, and used for extrapolation in the entire landscape.

Logistic regression is a generalised linear model for modeling binary response variables against categorical or continuous predictors. The grids showing tiger presence/absence were regressed against covariate data to understand the variables responsible for tiger occupancy and predict tiger presence in a landscape. The predicted (logistic regression based) tiger occupancy and observed occupancy (field sample at beat level) were compared for any misclassification. Misclassified grids were then subjected to field verification.

The occupancy modelling resulted in a tiger detection probability between 70-80%, and identifies the covariates which explain tiger occupancy. Prey abundance have positive influence and human disturbance indices have negative impact.

In the field, sites were selected as representatives of high, medium and low tiger density landscapes. Then 2 km x 2 km grid was overlaid on the map of the area (1 camera/4 sq km.). Cameras were allowed to operate for

a month to two, so as to capture most of the animals in the area.

Every tiger captured was given a unique identification number (eg MT-002), after examining stripe pattern on flanks, limbs, forequarters. Following tiger identification, capture histories (X matrix) were developed and analysed using the program MARK, CAPTURE and CARE.

Beats with tiger presence were mapped along with all other variables and data in GIS domain. A 10 km x 10 km grid was superimposed on this map. Information regarding predictor variables were extracted and averaged for this grid (100 sq km.). Logistic regression was used to remove ambiguity in the data and a

1165 and 1657 respectively.

Since this assessment of tiger population is based on determining spatial occupancy of tigers throughout potential tiger forests and sampling such forests using camera traps in a statistical framework, it is not comparable to the earlier total count using pugmarks owing to several shortcomings in the latter, and hence no comparison regarding the trend can be made.

The new findings indicate a poor status of tiger population in areas outside tiger reserves and protected areas. The tiger population, by and large, in tiger reserves and protected areas are viable, while requiring ongoing conservation efforts.

## INITIATIVES

**P**ROJECT Tiger is an ongoing centrally sponsored scheme, under which technical guidance and funding support is provided to states for conserving tigers in designated tiger reserves.

However, several constraints affect field implementation of the project. The events in the recent past have highlighted the fact that there is a need in the states for greater commitment to conservation goals and vigilance. There is also an urgent need to strengthen the system at the Project Tiger Directorate, which has the mandate to oversee and guide tiger conservation in the country.

Considering the urgency of the situation, Project Tiger has been converted into a statutory authority — National Tiger Conservation Authority (NTCA) — by providing enabling provisions in the Wild Life (Protection) Act, 1972 through an amendment. The Wild Life (Protection) Amendment Act, 2006 has come into force from September 4, 2006, and the NTCA has also been constituted on the same date. The amendment also provided enabling provisions for constitution of the Tiger and Other Endangered Species Crime Control Bureau and enhancement of punishment in cases of offences relating to a tiger reserve.

### OTHER INITIATIVES

■ Strengthening of anti-poaching activities, including special strategy for monsoon patrolling, by providing funding support to tiger reserve states, as proposed by them, for deployment of anti-poaching squads involving ex-army personnel/home guards, apart from workforce comprising local people, in addition to strengthening of communication/wireless facilities.

■ Declaration of eight new tiger reserves and in-principle approval accorded for creation of four new reserves — Sahyadri in Maharashtra, Pilibhit in Uttar Pradesh, Ratapani in Madhya Pradesh and Sunabeda in Orissa.



# Securing the tiger's future

■ The revised Project Tiger guidelines have been issued to states for strengthening tiger conservation, which apart from ongoing activities, include funding support to states for enhanced village rehabilitation package for people living in core or critical tiger habitats (from Rs 1 lakh to Rs 10 lakh per family), rehabilitation of communities involved in traditional hunting, mainstreaming livelihood and wildlife concerns in forests outside tiger reserves and fostering corridor conservation through restorative strategy to arrest habitat fragmentation.

■ A scientific methodology for esti-

imating tiger (including co-predators, prey animals and assessment of habitat status) has been evolved and mainstreamed. The findings of this estimation/assessment are benchmarks for future tiger conservation strategy.

■ An area of 29284.76 sq km has been notified by 15 tiger states as core or critical tiger habitat under section 38V of the Wildlife (Protection) Act, 1972, as amended in 2006. These states are Andhra Pradesh, Arunachal Pradesh, Assam, Chhattisgarh, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Mizoram, Orissa, Rajasthan,





Tamil Nadu, Uttarakhand, and West Bengal. Two tiger states (Bihar and Uttar Pradesh) have taken a decision to notify the core or critical tiger habitats (2765.04sq km). Madhya Pradesh has not identified/notified the core/critical tiger habitat in its newly constituted tiger reserve (Sanjay National Park and Sanjay Dubri Wildlife Sanctuary).

■ A tripartite memorandum of understanding has been implemented for concerted implementation of conservation in tiger reserve states.

■ Financial and technical help is provided to the states under various centrally sponsored schemes, viz. Project Tiger and Integrated Development of Wildlife Habitats for enhancing the capacity and infrastructure of the states for providing effective protection to wild animals.

■ India has a memorandum of understanding with Nepal on controlling trans-boundary illegal trade in wildlife and conservation, apart from a protocol on tiger conservation with China.

■ A Global Tiger Forum of Tiger Range Countries has been created for addressing international issues related to tiger conservation.

■ During the 14th meeting of the Conference of Parties to CITES, which was held from 3rd to 15th June 2007 at The Hague, India introduced a resolution along with China, Nepal and the Russian Federation, with directions to parties with operations breeding tigers on a commercial scale, for restricting such captive populations to a level support-

ive only to conserving wild tigers. The resolution was adopted as a decision with minor amendments.

■ As part of active management to rebuild Sariska and Panna tiger reserves where tigers have become locally extinct, reintroduction of tigers have been done.

■ The policy initiatives announced by the Finance Minister in his Budget Speech of 29.2.2008, inter-alia, contains action points relating to tiger protection. Based on the one-time grant of Rs 50 crore provided to the NTCA for raising, arming and deploying a Special Tiger Protection Force, the proposal for the said force has been approved by the competent authority for 13 tiger reserves. Rs 93 lakh each has been released to Corbett, Ranthambhore and Dudhwa tiger reserve for creation of STPF during 2008-09.

■ Special advisories issued for in-situ build-up of prey base and tiger population through active management in tiger reserves having low population status of tiger and its prey.

■ Based on India's strong intervention during the 58th meeting of the standing committee of the CITES at Geneva during 6-10 July, 2009, the CITES Secretariat has issued a notification to parties to submit reports on compliance of decisions 14.69 and 14.65 (progress made on restricting captive breeding operations of tigers etc) within 90 days (with effect from 20.10.2009).

■ In collaboration with TRAFFIC-INDIA, an online wildlife crime data base is being created, and generic



India made an intervention, appealing to China to phase out tiger farming, and eliminate stockpiles of Asian big cats' body parts and derivatives. The importance of continuing the ban on trade of body parts of tigers was emphasised

guidelines for reserve-specific security plan has been evolved.

There are four immediate issues in tiger conservation:

- ⌘ Poaching and depletion/isolation of source population
- ⌘ The existing or potential disturbance from activities, such as construction of infrastructure, presence of settlements, and extraction of minerals or produce.
- ⌘ Disruptions in traditional livelihoods of the local people, curtailment of their pre-existing entitlements due to conservation.
- ⌘ Providing resource for management, including protection, of tiger reserves, protected areas and other tiger bearing forests.

The task, no doubt, is formidable. For the future, status of tigers outside the protected areas and linkages in the landscape (with the communities, and also between the forests) are important. Sustainable landscapes are more relevant in the present scenario rather than advocating isolated management of protected areas. This calls for reorienting the sectoral priorities in such selected landscapes keeping in mind the *inclusive- exclusive* agenda recommended by the Tiger Task Force chaired by Sunita Narain.

— Inder Kathuria



Central assistance is being given to states to set up STPF in remaining 10 tiger reserves in 2009-10. Since then, the guidelines of the STPF have been revised for deploying forest personnel in place of police, with scope for involving local people



We all know NGOs can never match the scale of government operation, funds or manpower. But NGOs can help with information, expertise and passion. But the government agencies have to be ready to benefit from such help. There has to be mutual trust and honesty for this.

In Ranthambhore, our NGO Tiger Watch has done excellent work with the police department in getting several poachers arrested. The list is too long. But the experience with the forest department has not always been so good. Sometimes, when we have a good range officer available, who is dedicated and reacts fast to our leads, we have done great work together. Otherwise, many forest officers are more interested in suppressing our leads — they fear arrest of a poacher and his confession would bring them bad publicity.

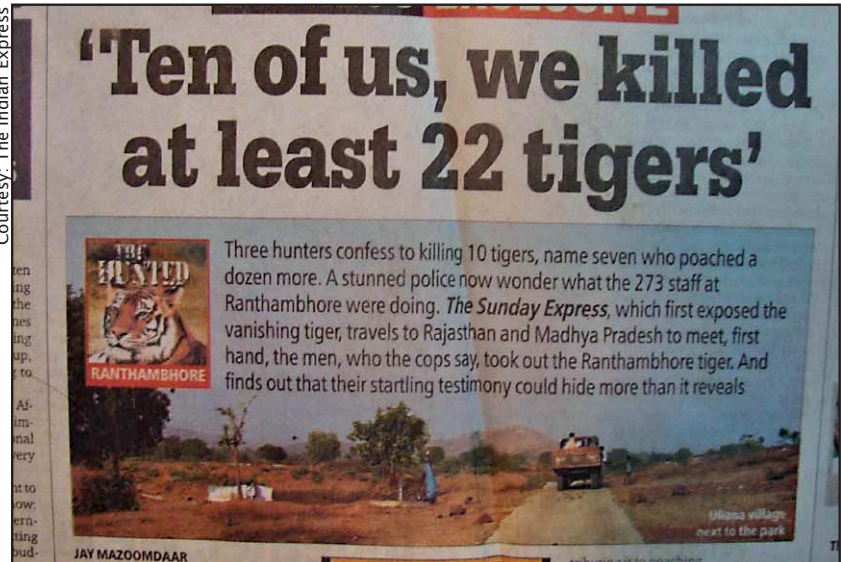
At the same time, NGOs also have to be accountable and dedicated. Many NGOs need a tiger crisis, so to say, to keep their funds flowing. I have heard instances of certain NGOs planting skins for fake seizures. Many forest officials are wary of NGOs plotting with the media to defame the forest department. But NGOs go to forest officials first. Only when the forest department tries to silence NGOs, they are forced to go to the press.

Effective enforcement is possible only when NGOs or governments do not have anything to hide. If a tiger is poached here today we must accept it and try to arrest the poacher before he kills another. But if we want to save our skin by denying the first poaching incident, the poacher will continue to kill more. That is how we lost most of our tigers.

Here, let me congratulate Dr Rajesh Gopal and the National

# Need not be such a lonely battle

Conservation demands sound public-private partnerships; they work wonders with a little trust and courage, feels **Fateh Singh Rathore**



A joint anti-poaching operation by TigerWatch and Rajasthan police

We cannot function without accepting the truth. I congratulate Dr Rajesh Gopal and NTCA for showing courage and honesty in declaring that India has only about 1500 tigers. But many of our states are still in denial and want to count paper tigers

Tiger Conservation Authority for the courage and honesty to accept that tiger numbers are down to less than 1500. We need to accept the truth and only then we can move ahead. But what Dr Gopal and NTCA are trying to do at the

Centre is not liked by many states who are still in the old mindset of denial. We heard how several states were reluctant to accept the new numbers. This attitude is the biggest problem. If we still don't show the courage to face the truth, we will lose many more tigers.

We have to look for innovative solutions. In Ranthambhore, we have embraced the Mogiyas, a traditional hunting tribe, to help integrate them into the mainstream. Our effort is to help educate their children and find alternative source of income for their families so that they can give up poaching for good.

*A retired wildlife officer, the writer is one of India's most experienced tiger experts*

# Change in Tiger Distribution

Historical distribution based on reports from the 18th and the 19th century

Present distribution of tigers based on Tehsil reports (1999-2004)



Human Population

2,384 Lakhs

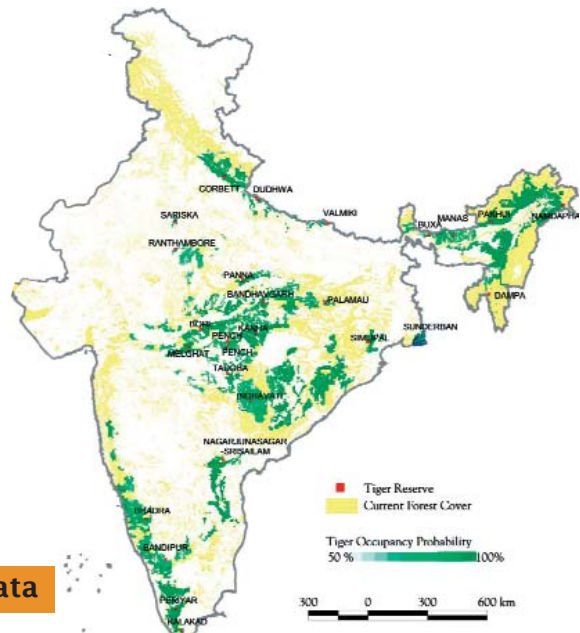


10,270 Lakhs

High potential tiger habitat

Modelled using logistic regression

Landscape characteristics and attribute data





## WHY TIGER?

Since tigers are at the top of the ecological “food-chain”, their conservation results in the overall conservation of all other species of plants and animals occupying the ecosystem. Tigers are indicators of the well being of the ecosystem. A healthy tiger population indicates that the other ecological components in its habitat are equally robust, since tigers need large amount of prey and good habitat. The investments made in a project of this kind are more than justified. Tiger conservation results in several intangible but yet life-supporting benefits too! Some such environmental externalities are:



### **Carbon di-oxide absorption (carbon sequestration)**

Tons and tons of fuel wood are used by us which release the carbon dioxide back into the atmosphere. Presence of a large quantum of carbon in the atmosphere due to several such emissions at a larger scale increases the “green house” effect contributing to the depletion of the ozone layer which is lethal, and hence the absorption of carbon by the forest vegetation becomes important for our survival, facilitated to a large extent by the forest cover conserved in tiger reserves and other protected areas. Presence of continuous forest cover to a depth of about ten km impacts the climate of the nearby area (almost upto hundred km). This phenomenon is beneficial to both human beings as well as agriculture crops, since they are protected from climatic extremes.



### **Rainfall**

The evapotranspiration from trees contribute to marginal increase in rainfall in the area, and becomes an additional advantage wherever the ground water is also sufficient.



### **Water harvesting**

The forest growth reduces the surface run-off and facilitates water storage as well as loss of top soil due to erosion, which may otherwise lead to reduction of impoundment in storage devices. The layer of decaying organic matter on a forest floor and the root system of the vegetation growing on it facilitate infiltration of water.



### **River flow**

The forest trees conserved in a tiger reserve and other protected areas regulate the water flow. The presence of trees in a catchment area absorb the water and release the same gradually. This is beneficial, since on one hand the risk of extreme flooding is reduced, and on the other the flow season is also extended.



No singular sustainable livelihood project can deliver such benefits in a “stand alone” manner, since the levels of sustainability are difficult to define, and such levels even when defined always entail compromises, and the net outcome of such trade-offs may not be tiger conservation! The fringe dwellers living around tiger reserves are dependent on forests for their livelihood. Though many of them are not in the food gathering stage, the resource dependency of such people needs to be reckoned for safeguarding the ecological viability of the habitats.



The strategy of “core-buffer” provides scope for ecodevelopment inputs. A small investment, based on site specific participatory planning in consultation with the people, complemented by sectoral integration of inputs in the larger surrounding landscape, is important to reduce the resource dependency through livelihood opportunities to such people.