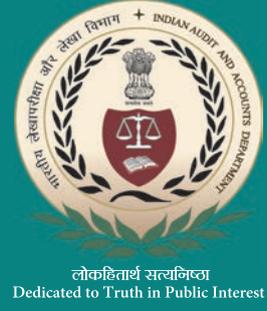




Report of the Comptroller and Auditor General of India



Performance Audit on Wildlife Conservation and Sustainable Management of Wildlife Habitats in Madhya Pradesh



Government of Madhya Pradesh
Report No. 1 of the year 2022

From top, left to right:

Indian Pangolin (Photo: Sanjay Shukla), Red Headed Vultures (Photo: Sanjay Shukla), Barasingha (Photo: Abhinandan Shukla), Indian Roller (Photo: Hari Nara), Tigers (Photo: Devendra Gogate), Asian Paradise Flycatcher (Photo: Feher Murtaza) Tigers (Photo: Shaurya Reshamwala), Indian Skimmer (Rajesh Kumar), Leopard (Photo: Farhan Khan)

**Report of the
Comptroller and Auditor General of India**

on

**Wildlife Conservation and Sustainable
Management of Wildlife Habitats in
Madhya Pradesh
for the year ended 31 March 2019**

Government of Madhya Pradesh
Report No. 1 of the year 2022
(Performance Audit)

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PREFACE

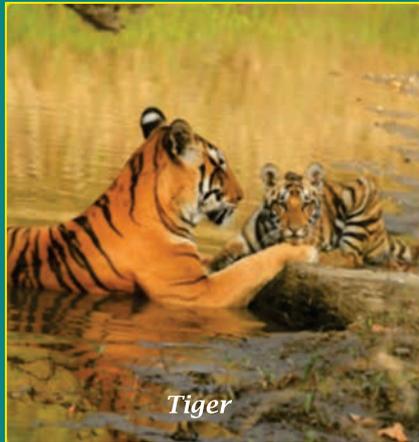
This Report of the Comptroller and Auditor General of India for the year ending 31st March 2019 has been prepared for submission to the Governor of Madhya Pradesh under Article 151 of the Constitution of India, for being laid before the Legislature of the State.

The Report contains significant results of Performance Audit of ‘Wildlife Conservation and Sustainable Management of Wildlife Habitats in Madhya Pradesh’, covering the period 2014-15 to 2018-19.

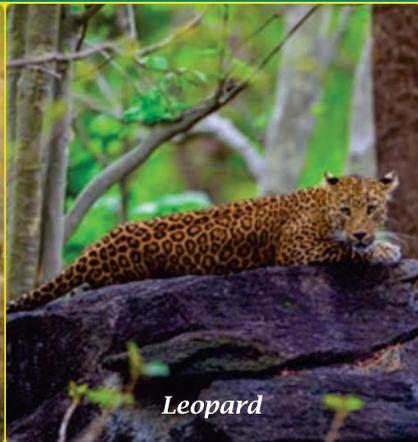
The instances mentioned in this Report are among those which came to notice in the course of test audit.

The audit has been conducted in conformity with the Auditing Standards issued by the Comptroller and Auditor General of India.

Executive Summary



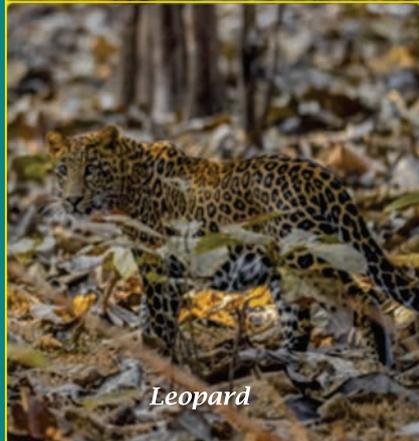
Tiger



Leopard



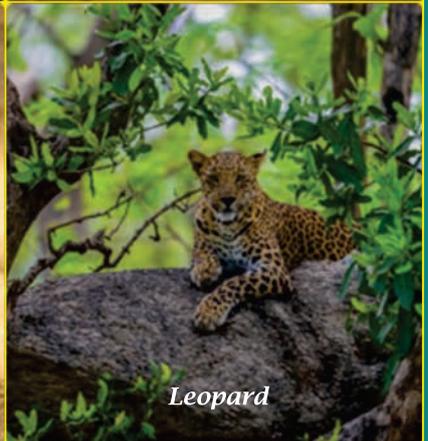
Tiger



Leopard



Tiger



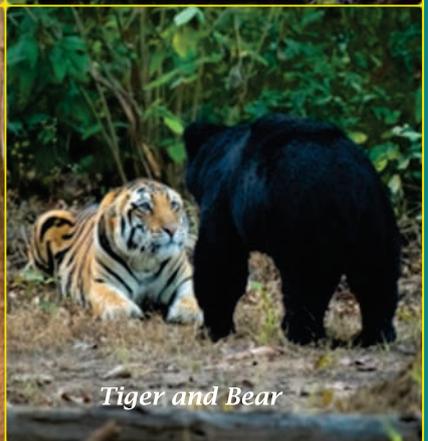
Leopard



Tiger



Leopard



Tiger and Bear

Photo courtesy (From top, left to right):
David Raju, Varun Thakkar, Farhan Khan
Varun Thakkar, Rana Bose, Varun Thakkar
Suyash Keshari, Varun Thakkar, Nitish Mishra

Executive Summary

Home to a phenomenal number of flora and fauna, many of them endemic and quite a few endangered, the forests and wildlife of Madhya Pradesh are treasures of the State. Known for its Tigers, the State has the largest¹ number of Tigers; three of the four² best managed Tiger Reserves in the country also belong to the State. Madhya Pradesh also boasts of the highest Leopard numbers in the country.

For any forest and their resident wildlife to flourish, the forest management needs to concentrate on two essential areas, namely, protection and conservation of wildlife *per se* and maintaining their habitats in a pristine and consolidated form. This Report on the “Wildlife Conservation and Sustainable Management of Wildlife Habitats in Madhya Pradesh” seeks to draw an assurance that the forests and their wildlife were being cared for and maintained by the Forest Department of the State, which is their custodian.

First and foremost, the number of Tigers increased over the period 2014-18. However, for the state of affairs to continue, foresighted, comprehensive and timely planning is of utmost importance. Our audit showed that most of the Protected Areas (like Tiger Reserves, National Parks and Wildlife Sanctuaries) sampled in audit did not enjoy the stipulated benefit of long-term Plans, viz. Management Plans (for National Parks and Wildlife Sanctuaries) and Tiger Conservation Plans (for Tiger Reserves). While the number of Tigers rose in spite of the absence of such Plans, issues relating to increasing density of the Tiger population and consequent effects, like territorial fights and deaths, possible inbreeding, genetic weaknesses and diseases, will prove to be more and more difficult to handle and control in the absence of the Plans. No coherent approach -- State-wide or site-specific -- was evident towards controlling poaching and conserving the habitats, not only for the Tigers but for all wild animals, big and small. Even where the hot-spots of poaching and illegal wildlife trade in specific Districts and along the interstate borders were identified, no coherent Plan was developed.

Zonal Master Plans are required to be prepared after the final notification of Eco-Sensitive Zones around the Protected Areas. These Master Plans contain provisions for activities to be allowed, regulated and prohibited for the management of the eco-fragile areas identified in the notifications. Our audit found that though notifications by the Government of India added 9,437 square kilometer of Eco-Sensitive Zones around the Protected Areas, the State Government did not prepare any Zonal Master Plans to regulate and prohibit activities in these Eco-Sensitive Zones.

In order to feed the Department with suitable and timely inputs in such fast-changing times, it is essential to co-opt individual researchers and institutions to provide scientific data that can underpin conservation efforts. The Tiger Conservation Plans and Management Plans identify and declare the research topics of interest. However, in the absence of appropriate Plans by the Department, such research topics were not identified for most of the sites. Even when Management Plans were prepared, the identified topics were rarely taken up for research. And

¹ Status of Tigers Co-predators and Prey in India (2018) by National Tiger Conservation Authority.

² 4th cycle of Management Effectiveness Evaluation of Tiger Reserves in 2018 by MoEFCC.

even where topics other than identified topics were allowed to be taken up for research by independent researchers, such research reports were not available with the Department. The Department was therefore left with no reliable feedback which could serve as critical inputs for their future plans to protect and conserve the forests.

Moreover, common issues which cause deaths, like electrocution, road kills, accidents along the railway tracks and snares, though well-known to the Department, were not adequately acted upon to minimise the mortality. In the same vein, especially fragile habitats, like the Son-Gharial Wildlife Sanctuary, home to the endangered Gharial were not supported by site-specific action.

To preserve, protect and consolidate the wildlife habitats, it is essential both to formally notify the areas covered under the Protected Areas, as well as co-ordinate with the Revenue Department, to ensure that the borders are kept inviolate and free from encroachment for which it is necessary to relocate the existing villages therein and their inhabitants to suitable places outside, after getting their consent and paying appropriate compensation. We noticed significant deficiencies in this aspect. Moreover, instances of Human-Wildlife Conflicts showed an increasing trend (by 73 per cent) over the period of audit. Currently, comprehensive efforts to keep the habitats inviolate did not exist at all the sites and where in place were not adequate.

An important part of habitat management is to prevent the genetic swamping of wild species and maintain the genetic purity of the fauna by allowing dispersal of the young and mixing of different sub-sets of wildlife population. This is usually ensured through the building of Wildlife Corridors. In a State like Madhya Pradesh where many Protected Areas are contiguous with Protected Areas of neighboring States, creation and maintenance of such intra and inter-state Wildlife Corridors need planning, co-ordination and concerted efforts. During audit, we were not able to draw an assurance that such efforts were made.

The Special Tiger Protection Force was not formed. We noted that the assessment of requirement for equipment like arms, wireless sets, and metal detectors was inadequate in the sampled Divisions. During joint physical verification of Patrolling Camps along with Forest Department officials, we surveyed the infrastructure, as well as adequacy of welfare of the front-line staff stationed in the camps. While the Camps were generally in good shape, delay in receiving salary and ration allowances, lack of elementary but essential items like mosquito nets and water bottles, lack of proper toilet facilities, etc. were seen as some of the main issues affecting their level of satisfaction.

Prevention and control of diseases around the Protected Areas did not appear to have been adequately monitored by the Department, cattle, dogs and cats around the Protected Areas were not vaccinated and veterinary support was inadequate in many Protected Areas.

Prompt action and timely decisions are keys to successful completion of any investigation. During the period of our audit, we noticed that three-fourth of forest offence cases were either compounded or submitted to courts i.e. taken to their logical end. Coupled with the fact that there was reduction of new cases being registered, the numbers gave an overall impression that

investigation of forest offence cases in these Protected Areas were largely at satisfactory level. However, in about 20 *per cent* cases, decisions were pending for some time.

In order to maintain the inviolate nature of Protected Areas, it is imperative that constructions do not disturb the habitat particularly in the Core Areas. The Ken-Betwa River Linking Project was approved by both the State Board for Wild Life and National Board for Wild Life, even as its adverse impact on the Core Area of the Panna Tiger Reserve was acknowledged by PCCF/ Wildlife. Other instances of major constructions were also noticed during the audit period, with at least three of these affecting the inviolate Core Areas.

We also noticed the successes of the Department in translocating and rehabilitating wildlife within the State. Notable being translocation of Tigers to Nauradehi Wildlife Sanctuary and Sanjay Tiger Reserve and Chital to other Protected Areas. The most significant achievement was the rehabilitation of the Tigers in an empty Panna Tiger Reserve in 2009, which boasts of 25 healthy adults in 2018.

We concluded that while there is much that is happening in the forests of Madhya Pradesh that is good, lack of plans and absence of any research that must feed into such plans, constitute a critical lacuna. The risks are currently latent, can impact the sustainability say when the Tiger population density goes beyond 10 per 100 square kilometer, then without good Wildlife Corridors connecting the Protected Areas, the increasing number of Tigers can lead to various inter-connected and cascading risks such as deaths due to territorial fights, diseases from inbreeding. These can raise the risk that the current vibrant population may sicken and plummet in the coming few years. It is hoped that necessary remedial action will be taken by the Department in time. Our recommendations are geared to aid the Department to take necessary remedial action in time so that flora and fauna of the State continue to flourish.

Recommendations:

I. Policies and Planning

- *The Forest Department may support preparation of Tiger Conservation Plans/ Management Plans through dedicated team, and a laid down process along with comprehensive Guidelines for preparation of Management Plans may also be prescribed;*

(Recommendation 1)

- *The State Government may ensure preparation and approval of Zonal Master Plans in a time-bound manner and ensure monitoring of activities included therein in an effective manner;*

(Recommendation 2)

- *The Department may establish institutional tie-ups to cause research in areas identified in the Tiger Conservation Plans/Management Plans;*

(Recommendation 3)

- *The State Government may speed up the process of establishment of Special Tiger Protection Force;*

(Recommendation 6)

- *The Department may ensure that a site specific Human-Wildlife Conflict Mitigation Plan is prepared and implemented for each Tiger Reserve/ National Park/ Wildlife Sanctuary;*

(Recommendation 8)

II. Financial Management

- *The Department may put in place a monitoring tool that tracks allocation and utilisation of funds on each activity identified in the Tiger Conservation Plans/ Management Plans;*

(Recommendation 4)

- *The State Government may remove bottlenecks in funding for activities relating to welfare activities for frontline staff;*

(Recommendation 11)

III. Human Resources and Other Resources

- *The Department may rationalize the sanction and deployment of human resource and other resources by laying down suitable norms and scales;*

(Recommendation 7)

- *PCCF/ Wildlife may ensure implementation of disease control and surveillance programmes by providing adequate staff, training and infrastructure;*

(Recommendation 9)

IV. Implementation of Conservation

- *The Department may identify the causative factor for high incidence of poaching and deaths and the hot spots to adopt site specific protection measures;*

(Recommendation 5)

- *The Department may ensure that the activities and infrastructure related with tourism are rationalized so as to not disturb the well-being of wild animal and the habitats;*

(Recommendation 10)

- *The State Government may complete the processes of demarcating boundaries of Protected Areas and Tiger Reserves by using digital and cadastral maps;*

(Recommendation 12)

- *The control of illegal mining in Son-Gharial Wildlife Sanctuary may be strengthened by speeding up the investigations of registered cases;*

(Recommendation 13)

- *The State Government may ensure that all adverse impacts on Ken-Betwa River Linking Project as well as other infrastructure development projects on the wildlife and their habitats are adequately mitigated. Further, the State Government may consider forming an expert committee to specifically monitor the adequacy and timeliness of mitigation measures.*

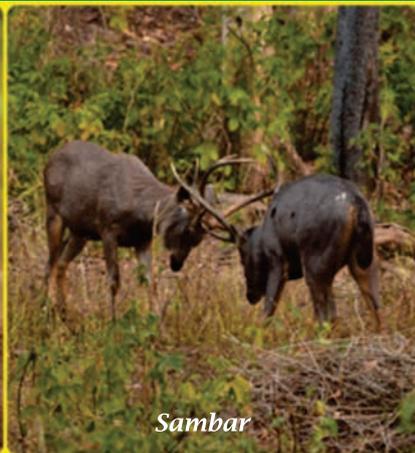
(Recommendation 14)

Chapter 1

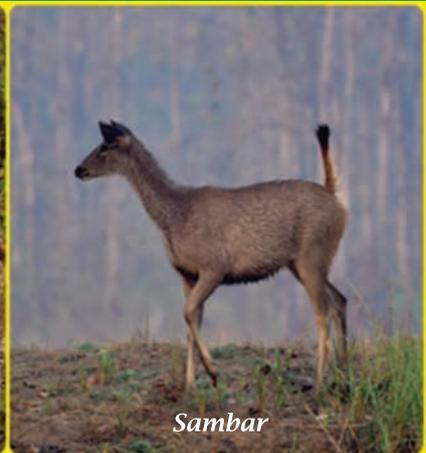
Introduction



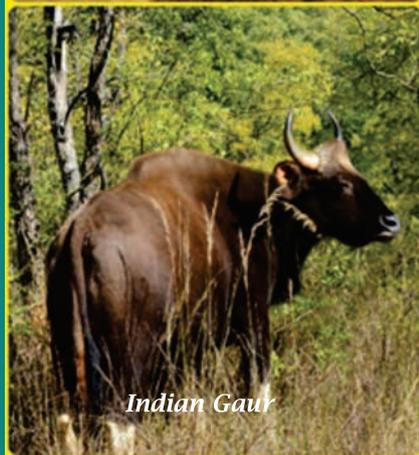
Sambar



Sambar



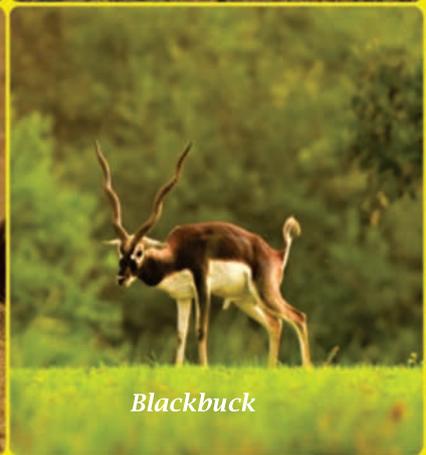
Sambar



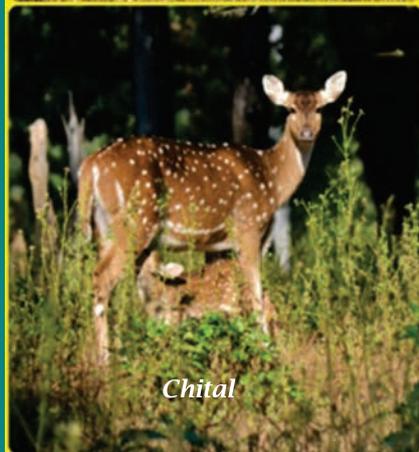
Indian Gaur



Indian Giant Squirrel



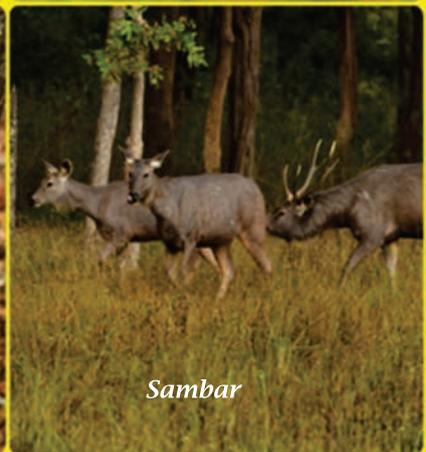
Blackbuck



Chital



Langur



Sambar

Photo courtesy (From top, left to right):
Abhinandan Shukla, Abhinandan Shukla, Abhinandan Shukla
Abhinandan Shukla, Abhinandan Shukla, Abhinandan Shukla
Abhinandan Shukla, Varun Mani, Abhinandan Shukla

Chapter 1

Introduction

1.1 Introduction

Wildlife consists of all uncultivated flora and undomesticated fauna. Every species has the right to live and every threatened species must be protected to prevent its extinction. Wildlife conservation is not just a strategy aimed at protection of rare, threatened and endemic biodiversity but is a well-recognized means of achieving ecological security, human well-being and sustainable development of any country.

The Wildlife (Protection) Act, 1972 recognises the overarching goals of wildlife protection and empowers¹ the State Government to notify an area of significance as a Protected Area, i.e., Sanctuary and National Park respectively. Core areas of Tiger Reserves are considered inviolate prohibiting activities such as grazing etc. National Parks and Wildlife Sanctuaries allow some activities with restrictions and under the regulation of the Chief Wild Life Warden.

Box 1.1: Forest cover in Madhya Pradesh

Madhya Pradesh, the second largest State in India covers an area of 3.1 lakh sq. km., which is



Tigress with Cubs in Pench River in Pench Tiger Reserve, Seoni

(Source: Field Director, Pench Tiger Reserve)

9.4 *per cent* of the total geographic area of the country. The State, with forest cover² of 77,482.49 sq. km.³ covers around 25.1 *per cent* of its geographical area.

The Forests fall under 21 forest types categorised under five⁴ forest type groups. Very Dense Forest comprises of 6,676.02 sq.km. (**Chart-1.1**). Increase in forest cover in the State during 2017-19 was 68 sq.km. (0.09 *per cent*), lower than the national average of 0.56 *per cent* during the same period.

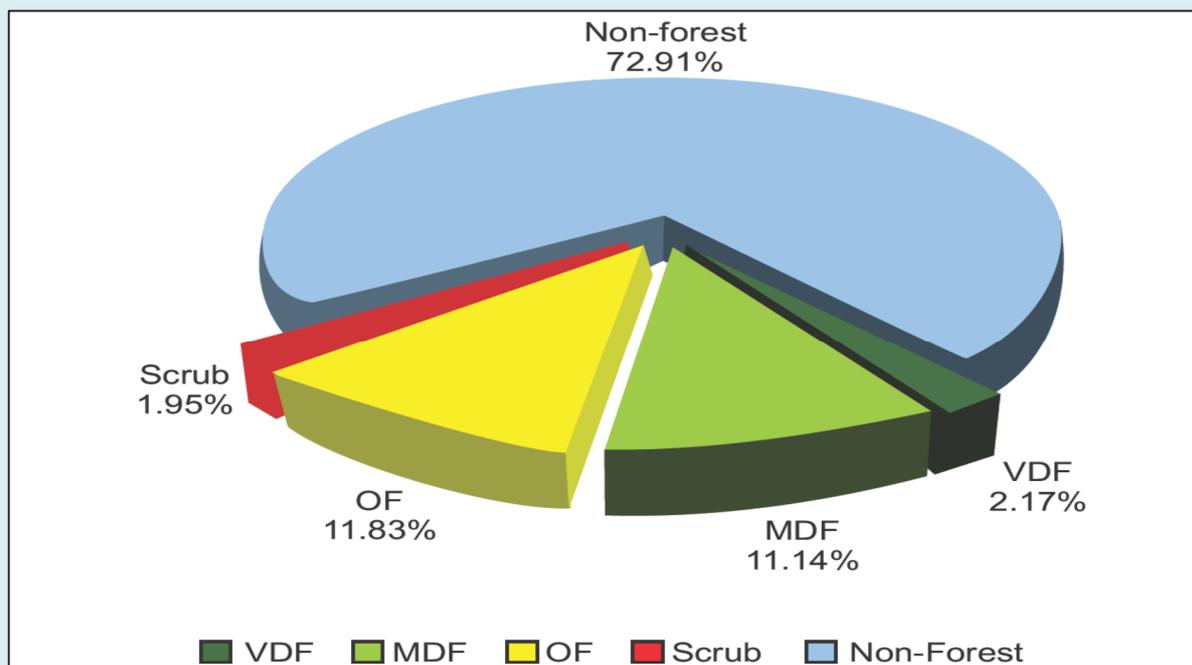
¹ Under Sections 18 and 35 of the Wildlife (Protection) Act, 1972, the State Government can declare an area of significance as Protected Areas, i.e., Sanctuary and National Park respectively. Further, the notifications for Tiger Reserves are issued by the State Government under Section 38(V) of the Wildlife (Protection) Act, 1972. There are also provisions for notification of Conservation Reserves and Community Reserves under Wildlife (Protection) Act, 1972. However, these have not been notified in Madhya Pradesh.

² All land more than one hectare in area, with a tree canopy density of more than 10 *per cent* irrespective of ownership and legal status. Such land may not necessarily be a recorded forest area.

³ As per India State of Forest Report 2019.

⁴ Tropical Moist Deciduous Forest, Littoral and Swamp Forest, Tropical Dry Deciduous Forest, Tropical Thorn Forest and Sub-Tropical Broad-Level Hill Forest.

Chart-1.1: Forest Cover of Madhya Pradesh



(VDF-Very Dense Forest, MDF-Moderately Dense Forest, OF-Open Forest)

Source: India State of Forest Report, 2019, Forest Survey of India.

The State has 52 Districts, of which 21 are tribal districts. Balaghat and Sheopur Districts have forest cover of more than 50 *per cent* of their geographical area. Four districts—Dindori, Mandla, Sidhi and Umaria—have forest cover in excess of 40 *per cent* of their geographical area. These six districts have one National Park⁵ and three Tiger Reserves⁶ between them. Major part of Kanha-Pench Corridor in the State is in Balaghat District. The State harbours rich biodiversity of flora and fauna⁷.

The State Government has notified 11 National Parks and 24 Wildlife Sanctuaries till date. Total notified Protected Area in Madhya Pradesh is over 11,393 sq. km, out of which 4,773.638 sq. km. is notified as Critical Tiger Habitat (Core Zone of Tiger Reserve). Additionally, areas within two sq. km. of the periphery of National Parks and Wildlife Sanctuaries and in case of Tiger Reserves, entire area of Buffer Zone of Tiger Reserves, are notified as Eco-Sensitive Zones to act as shock absorbers. 30 Eco-Sensitive Zones with an area of over 9,437 sq. km. have been notified so far.

⁵ Kuno National Park.

⁶ Bandhavgarh, Kanha and Sanjay Tiger Reserves.

⁷ Madhya Pradesh harbours more than 45 species of mammalian fauna which is about 10 *per cent* of India's wild mammals. The carnivore guild in Madhya Pradesh consists of Tiger, Leopard, Sloth-bear, Dhole, Striped Hyena, Jackal, Wolf, Jungle Cat, Wild Cat, Rusty-Spotted Cat, Smooth Coated Otter, Indian Grey Mongoose, Ruddy Mongoose, Common Palm Civet and Oriental Civet. The ungulate guild is mainly comprised of Gaur, Nilgai, Sambar, Chital, Barking Deer, Blackbuck, four horned Antelope, Chinkara, Mouse Deer and hard ground Barasingha.

Floristic composition includes Overwoods: Teak, Saja, Mahua, Tendu, Bija, Tinsa, Semal, Haldu, etc.; Underwoods: Aonla, Amaltas, Kumbhi, etc.; Shrubs: Bekal, Karonda, Jhau, etc; Grasses: Mauritian grass (Apluda Mutica), East Indian Crabgrass (Digitaria Setigera), Black Speargrass (Heteropogon Contortus), Japanese Lovegrass (Eragrostis tenella), Kangaroo grass (Themeda Quadrivalvis), Green Foxtail (Setaria Glauca), etc.; and climbers such as Chilati, Mahulbel and Palasbel.



Ranging Tiger in Panna Tiger Reserve

(Source: Photo captured during field visit by Audit Team)

1.2 Organisational set-up

Forest Department, Madhya Pradesh is headed by the Additional Chief Secretary/ Principal Secretary, Forests at the Government level. **Chart-1.2** gives the details of the organisational structure. The field formations are headed by the Field Directors in Tiger Reserves, Directors in National Parks and Divisional Forest Offices in Wildlife Sanctuaries.

Chart-1.2: Organisational Structure of Wildlife wing of Forest Department

Additional Chief Secretary	Head of the Department at Government Level
Principal Chief Conservator of Forests (Head of Forest Force)	Head of Department at Department Level
Principal Chief Conservator of Forest (Wildlife)	Chief Wild Life Warden, Madhya Pradesh (Responsible for Management of Wildlife in the State)

Field Director (Management of Tiger Reserves)	Director (Management of National Parks under Wildlife Division)	Divisional Forest Officer (Management of Wildlife Sanctuaries under the Division)
<ul style="list-style-type: none"> • Deputy Director (Assists Field Director) • Assistant Director (Management of Sub Division) • Range Officer (Range Level) • Deputy Ranger (Circle Level) • Beat Guard (Beat Level) 	<ul style="list-style-type: none"> • Assistant Director (Management of Sub Division) • Range Officer (Range Level) • Deputy Ranger (Circle Level) • Beat Guard (Beat Level) 	<ul style="list-style-type: none"> • Sub Divisional Officer (Management of Sub Division) • Range Officer (Range Level) • Deputy Ranger (Circle Level) • Beat Guard (Beat Level)

1.3 Financial Arrangements for Wildlife Conservation and Habitat Management

Funds for conservation and protection of wildlife and management of wildlife habitats are sourced through the State Budget, Development Fund in the Tiger Reserves/ National Parks

and the Compensatory Afforestation Fund⁸. State Budget includes State Funds⁹ as well as funds received under a Centrally Sponsored Scheme 'Integrated Development of Wildlife and Habitat/ Project Tiger'.

During the audit period 2014-15 to 2018-19, a sum of ₹ 633.32 crore was spent under the Centrally Sponsored Scheme and ₹ 1,265.92 crore under the four State Schemes, as detailed in **Appendix 1.1**. While ₹ 198.10 crore was spent against receipts under the Development Fund, an amount of ₹ 163.23 crore was spent under the Compensatory Afforestation Fund during 2014-15 to 2018-19.

1.4 Audit Objectives

The Performance Audit was conducted to assess whether:

- Measures for conservation and protection of wildlife were adequately planned and implemented,
- Wildlife habitats were developed and managed for sufficient forest cover and consolidation of habitats, and sustainable habitat management.

1.5 Scope of Audit and Methodology

In Madhya Pradesh, 11¹⁰ National Parks and 24¹¹ Wildlife Sanctuaries have been notified. In addition, there are six Tiger Reserves, viz Kanha, Bandhavgarh, Pench, Panna, Satpura and Sanjay Tiger Reserve. Further, one Forest Division, viz Kanha Tiger Reserve (Buffer Zone) is the notified buffer area¹² of Kanha Tiger Reserve. These are managed by 22 Administrative Units as shown in **Appendix 1.2**.

We reviewed records of 14 Units, covering Office of the Principal Chief Conservator of Forests/ Wildlife (henceforth mentioned as PCCF/ Wildlife) and 13¹³ Divisions for the period 2014-15 to 2018-19 (henceforth mentioned as 2014-19). Since the statistics of a forest offence data is maintained calendar year- wise by the Forest Department, hence those were reviewed for the period 2014 to 2018 (henceforth mentioned as 2014-18). The Divisions were selected on the basis of Stratified Random Sampling method. 100 *per cent* Divisions of Tiger Reserve and National Parks were selected whereas three Divisions managing Wildlife Sanctuaries were

⁸ Funds collected from user agencies in cases of diversion of forest land for non-forestry purposes under the provisions of Forest Conservation Act, 1980.

⁹ Funds under schemes: 'National Park', 'Compensation for human casualties by wild animals', 'Compensation for relocation of villages', and 'Wildlife management outside Protected Areas'.

¹⁰ Bandhavgarh, Dinosaur Fossile, Ghughwa Fossile, Kanha, Kuno, Panna, Pench, Sanjay, Satpura, Madhav and Van Vihar.

¹¹ Bagdara, Bori, Chambal, Gandhi Sagar, Gangau, Karera, Ken Gharial, Kheoni, Narsinghgarh, Nauradehi, Orchha, Pachmari, Panpatha, Pench Mowgli, Phen, Ralamandal, Ratapani, Sailana, Sanjay Dubri, Sardarpur, Singhori, Son Chidiya, Son Gharial and Virangana Durgavati.

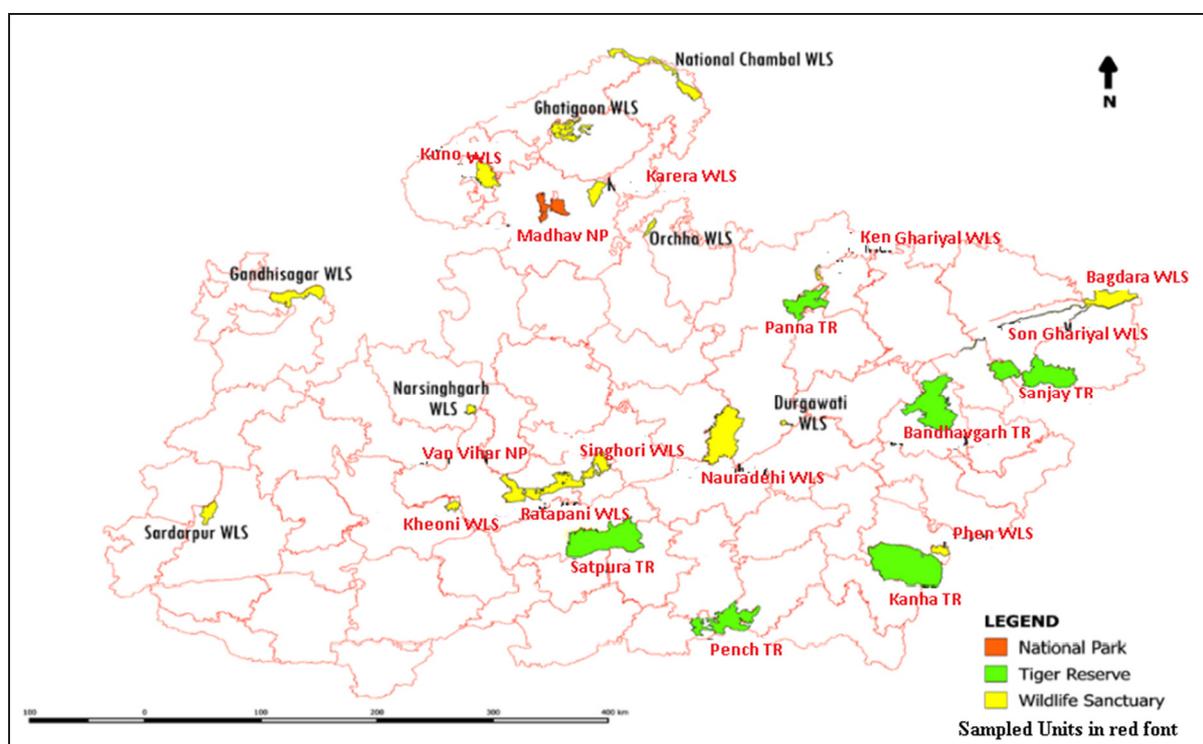
¹² Buffer area notified under Section 38 (V) of Wildlife (Protection) Act, 1972, consists of the area peripheral to Critical Tiger Habitat of Tiger Reserve where a lesser degree of habitat protection is required to ensure the integrity of the Critical Tiger Habitat.

¹³ Tiger Reserves: Bandhavgarh (Umaria), Kanha (Core and Buffer) (Mandla), Panna (Panna), Pench (Seoni), Sanjay (Sidhi) and Satpura (Hoshangabad); National Park Divisions: Kuno, Madhav and Van Vihar; Divisions; Dewas, Nauradehi and Obedullaganj.

selected on random basis. The sampled Divisions manage a total of six¹⁴ Tiger Reserves (including six National Parks and six Wildlife Sanctuaries in these Tiger Reserves), three¹⁵ National Parks and other nine¹⁶ Wildlife sanctuaries. Thus, we covered a total of 24 National Parks and Wildlife Sanctuaries in audit. Division wise coverage of Tiger Reserves and Protected Areas is shown in **Appendix 1.3**.

We held an Entry Conference with the Additional Chief Secretary, Forest Department on 11 December 2019 to discuss about the audit objectives, coverage, sample size and audit methodology. An Exit Conference was held with the Principal Secretary, Forest Department on 1 July 2021 to discuss audit observations and seek Government views thereon. The State Government in its replies (July and September 2021) generally accepted the audit observations and provided an assurance that speedy and appropriate remedial action was under progress.

Map-1.1: Map showing Tiger Reserve, National Park and Wildlife Sanctuary Divisions in Madhya Pradesh



We conducted interviews of staff engaged in patrolling work during joint inspection, for obtaining responses regarding medical facilities, provision of protective equipment, timeliness in payment of wages, etc. We also consulted research papers on topics related to wildlife and habitat management.

¹⁴ Bandhavgarh Tiger Reserve (Bandhavgarh National Park and Panpatha Wildlife Sanctuary), Kanha Tiger Reserve (Kanha National Park), Panna Tiger Reserve (Panna National Park and Gangau Wildlife Sanctuary), Pench Tiger Reserve (Pench National Park and Pench Mowgli Wildlife Sanctuary), Sanjay Tiger Reserve (Sanjay National Park and Sanjay Dubri Wildlife Sanctuary) and Satpura Tiger Reserve (Satpura National Park and Bori and Pachmari Wildlife Sanctuaries).

¹⁵ Kuno National Park, Madhav National Park and Van Vihar National Park.

¹⁶ Bagdara (Sidhi), Karera (Shivpuri), Ken Gharial (Panna), Kheoni (Dewas), Nauradehi (Sagar), Pheni (Mandla), Ratapani and Singhori (Obedullaganj) and Son Gharial (Sidhi).

1.6 Audit Criteria

We used the following as sources of audit criteria for this Performance Audit:

- Wildlife (Protection) Act, 1972;
- Indian Forest Act, 1927;
- Compensatory Afforestation Fund Act, 2016;
- 2nd National Wildlife Action Plan 2002-16;
- Management Plans and Tiger Conservation Plans;
- Guidelines issued by Ministry of Environment, Forest and Climate Change, Wildlife Institute of India and National Tiger Conservation Authority;
- Government of Madhya Pradesh, Chief Wild Life Warden's orders; and
- Study reports on Wildlife management issues.

1.7 Previous audit

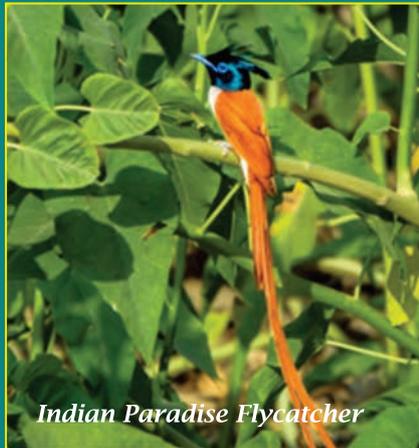
A Performance Audit on 'Working of Tiger Reserves, National Parks and Sanctuaries' was conducted in 2013-14 with the main objectives being to assess the performance of the Department on planning for conservation and protection of wildlife, measures for conservation of wildlife and its habitats, protection of wildlife and its habitat, and initiatives for eco-development of local inhabitants. The Performance Audit featured in the Audit Report No. 1 of the Year 2015.

This Report is under the examination of the Public Accounts Committee. Only one subparagraph had been discussed in the Public Accounts Committee; however, Action Taken Report had not been received (July 2021). During current audit, we found that many of the deficiencies pointed out in the Report of 2015 still persist, as spelt out in succeeding Chapters.

1.8 Acknowledgement

The Office of the Accountant General (Audit-II), Madhya Pradesh, Bhopal acknowledges the co-operation and assistance extended by the staff and officers of the Forest Department, Government of Madhya Pradesh during the course of conduct of performance audit.

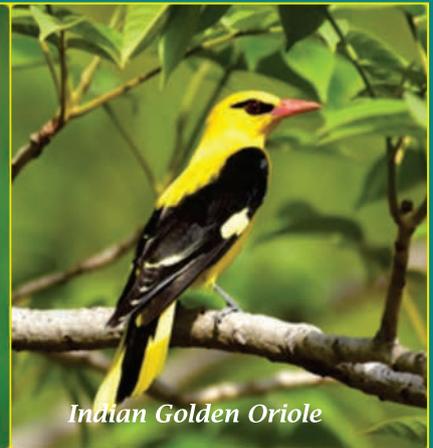
Chapter 2
Planning for Conservation and Protection of Wildlife
and
Management of Habitats



Indian Paradise Flycatcher



Spotted Owlet



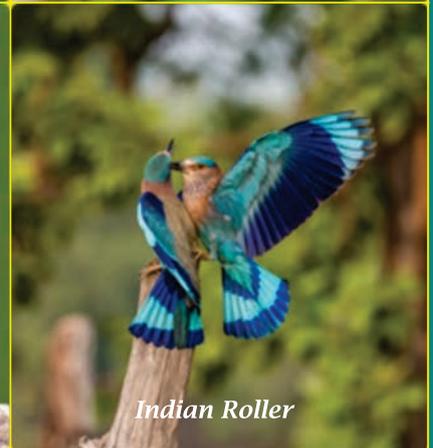
Indian Golden Oriole



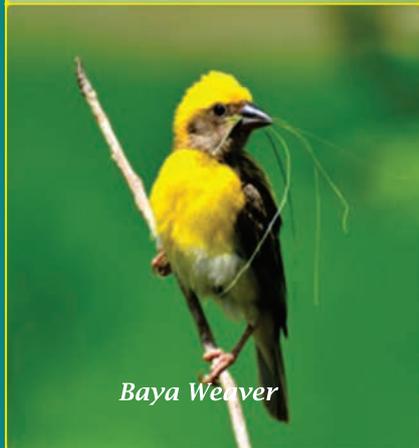
Crested Bunting



Common Kingfisher



Indian Roller



Baya Weaver



Orange Headed Thrush



Black-naped Monarch

Photo courtesy (From top, left to right):
Bappi, Sanjay Dutt, Sanjay Dutt
Shariq Khan, Sanjay Dutt, Jagdish Gada
Sanjay Dutt, Sanjay Dutt, Bappi

Chapter 2

Planning for Conservation and Protection of Wildlife and Management of Habitats

Summary

Timely, comprehensive and strategic planning whether annual or long-term (10 years), lies at the heart of effective management of Protected Areas. The long-term plans, i.e. the Tiger Conservation Plans and Management Plans, focus on general as well as site-specific issues which take a longer span of time to show their impact. The long-term Plan also helps in not losing focus of the important issues, even when incumbent forest officials get changed in the interim. Three out of six Tiger Reserves, one out of three National Parks and six out of 10 Wildlife Sanctuaries that were audited did not have Tiger Conservation Plans/ Management Plans.

The long-term Plans are broken down into more granular Annual Plan of Operations, which deal with smaller issues needing immediate attention. While Annual Plan of Operations was prepared, we found in certain instances where the Annual Plans did not bear co-relation with activities included in long term Plans.

Research activities are a very important and scientific source of baseline inputs for plans. However, the Tiger Conservation Plans/ Management Plans which identify the topics of interest were not freely available in the public domain. We also noticed that there were no institutional tie ups with reputed institutes or researchers to conduct research in a time bound manner. Out of 206 themes proposed to be taken up for research in the long term plans, only two were actually selected by researchers. Another 74 topics outside of those mentioned in the plans were proposed by independent researchers and allowed by the Department. However, only nine reports out of these 74 topics taken up were available with the Department.

2.1 Why are Plans important?

Conservation of Wildlife and their habitats involve multiple authorities as well as locals over a long time-frame. This makes long-term planning an important tool in the conservation of endangered species in the Protected Areas. Conversely, absence of long-term plans impinges adversely on conservation.

Box 2.1: Conservation of endangered species requires long-term plans

The Protected Areas of Madhya Pradesh which were selected by audit are home to some endangered species as detailed in **Table 2.1**.

Table 2.1: Conservation of Endangered Species

Sl. No.	Protected Area	Endangered species	Status of conservation efforts
1	Son Gharial Wildlife Sanctuary	Gharial	<p>Son River in Sanjay Tiger Reserve is the habitat to various species of aquatic animals, including the Gharial. Accordingly, the State Government notified the Son Gharial Wildlife Sanctuary for crocodile and aquatic conservation. A census conducted in 2008 enumerated the total population of Gharial in the Son Gharial Wildlife Sanctuary at 224, which by February 2019 had come down to 45. According to the findings of a survey conducted by the Department in 2019, the decreasing population of Gharial was mainly attributable to inadequate male population of Gharial; illegal quarrying and fishing on the banks of the river which led to habitat decimation and biotic pressure on the nesting sites of Gharials and Mugger; and a lack of trust between the local community and the Department. The Management did not fill the deficiency of male Gharial. The Field Director assured us that efforts are being made to reduce the biotic pressure which was not however supported by the survey reports which showed declining numbers.</p>
2	Kuno National Park	Rusty-spotted Cat	<p>The Rusty-spotted Cat is listed as a Schedule-I species under the Wildlife (Protection) Act, 1972 of India and is classified as 'Vulnerable' by the International Union for Conservation of Nature Red List (2008). Photographic record of Rusty-spotted Cat was captured in December 2012. The National Park did not develop a long-term plan for its conservation. The Director assured us that a conservation plan would be incorporated in the upcoming Management Plan.</p>
3	Kuno National Park	Asiatic Lion	<p>At present Gir National Park is a single habitat of Asiatic Lions in the world. The data collected by the Wildlife Biologists highlighted the necessity of a second natural habitat for its long-term conservation. In order to prepare ground for relocation of Asiatic Lions to Kuno, the State Government rehabilitated about 1,545 families of 24 revenue villages living inside Kuno outside the National Park. In the meanwhile, Hon'ble Supreme Court directed Ministry of Environment, Forest and</p>

Sl. No.	Protected Area	Endangered species	Status of conservation efforts
			Climate Change in April 2013 to constitute an Expert Committee to fast track reintroduction of Asiatic Lion in Kuno National Park. Six meetings of the Committee were convened up to February 2019, but the re-introduction process of Asiatic Lion to Kuno National Park could not be undertaken. The Director stated (September 2019) that the matter is being addressed at Government level for resolution.
4	Bandhavgarh Tiger Reserve	Smooth-coated Otter	Smooth-coated Otter is listed as 'Vulnerable' in the International Union for Conservation of Nature Red List of threatened species and is legally protected in India under Schedule II of the Wildlife (Protection) Act, 1972. The species was previously unreported in Bandhavgarh Tiger Reserve. One Smooth coated-Otter was recorded in a camera trap in February 2016 in the Buffer zone of the Tiger Reserve. A report suggested a comprehensive study of the distribution patterns of the Smooth-coated Otter. However, the Management did not conduct the study. The Field Director stated (October 2020) that the sighting mentioned in the report was only a coincidence.
5	Pench Tiger Reserve	Barasingha	Barasinghas had a historic presence in Pench Tiger Reserve, but there are none at present. Connected to Pench through a corridor, is the Kanha Tiger Reserve, where they are in abundance. However, the Pench Tiger Reserve did not prepare any plan to re-introduce Barasinghas. The Field Director stated (September 2019) that the process would be initiated after consultation with experts.
6	Karera Wildlife Sanctuary	Great Indian Bustard	The Great Indian Bustard is a critically endangered bird with less than 150 left in India/world (survey conducted by Wild Life Institute of India in 2017-18). The Management Plan of Karera Wildlife Sanctuary for the period 2008-18 acknowledged that excessive biotic pressure and excessive population of black buck destroyed the eggs of Great Indian Bustard leading to its local extinction. In the prescriptive list in the Plan was (i) develop an area of 45.33 square kilometre of original natural

Sl. No.	Protected Area	Endangered species	Status of conservation efforts
			habitat of the Great Indian Bustard as core area; (ii) 55.55 square kilometre Government revenue land should be transferred in favour of Forest Department; and (iii) reintroduction of Great Indian Bustard and promote eco-tourism. However, the proposal for transfer of land was not sent to the Revenue Department. The prescriptions of the Management Plan were not undertaken. Director stated (December 2019) that Great Indian Bustard had not been seen in the Wildlife Sanctuary since 1994 and that de-notification process is in progress at Government level.

The State Government agreed (September 2021) to the observation.

2.2 Availability of Plans

Each Protected Area¹⁷ and Tiger Reserve should have its own plan based on scientific and ecological data. The Tiger Conservation Plan in each Tiger Reserve, approved by the National Tiger Conservation Authority, is also a legal requirement under the Wildlife (Protection) Act, 1972. In addition, the Eco-Sensitive Zones, i.e. notified peripheral areas that fall within two kilometre of protected areas, and in the case of Tiger Reserves up to the entire Buffer area of the Tiger Reserve, must have a Zonal Master Plan. The Annual Plan of Operations—which form the basis for demand of funds from the Government of India and on which there is high compliance—are prepared on the basis of the Tiger Conservation Plans and the Management Plans. **Table 2.2** below summarises the requirements of planning:

Table 2.2: Planning Requirements

Sl. No.	Name of the Plan	For	Periodicity (years)	Approving Authority	Provisions
1	Tiger Conservation Plan	Tiger Reserves	10	National Tiger Conservation Authority	Section 38(V) of Wildlife (Protection) Act, 1972
2	Management Plan	Wildlife Sanctuaries and National Parks	10	Principal Conservator of Forest/ Wildlife	Section 33 of Wildlife (Protection) Act, 1972
3	Zonal Master Plan	Eco-Sensitive Zone	---	State Government	Notifications of Eco-Sensitive Zones by Ministry of Environment, Forest and Climate Change.
4	Annual Plan of Operations	Demand of funds from Government of India	One year	Ministry of Environment, Forest and Climate Change.	Guidelines on 'Centrally Sponsored Schemes'

¹⁷ As provisioned in 2nd National Wildlife Action Plan, 2002-16.

The Tiger Conservation Plans and Management Plans are required to be prepared and approved before the expiry of previous plan period. The task is assigned to the respective Protected Area managers. Components of the Plans are in **Table 2.3**:

Table 2.3: Components of Plan

Components	Visions, Goals, Objectives and Problems, Management Strategy, Research Monitoring and Training, Tiger population and habitat assessment, Protection and intelligence gathering, Eco-tourism and Interpretation, Organisation, Administration and Budget, Monitoring and Evaluation.
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2.2.1 Tiger Conservation Plan

Separate Tiger Conservation Plans are to be prepared on the basis of guidelines¹⁸ for the Core and Buffer Areas. The Core Area is required to be inviolate, while the Buffer Area, peripheral to the Core, is aimed to promote co-existence between wildlife and human activity. The status of the approved Plans in the six Tiger Reserves during the audit period 2014-19 is at **Table 2.4**. Out of six Tiger Reserves, three had approved Tiger Conservation Plans during the audit period.

Table 2.4: Status of Approved Plans

Sl. No.	Tiger Reserve	Date of Notification	Period of approved Tiger Conservation Plan	Remarks
1	Kanha (Core)	December 2007	2011-12 to 2020-21	Available
	Kanha (Buffer)	October 2010	2011-12 to 2020-21	Available
2	Panna (Core)	December 2007	Nil	1 st Tiger Conservation Plan since notification of Panna (Core) 12 years back, was sent to National Tiger Conservation Authority for approval in June 2019. Yet to be approved as of March 2021.
	Panna (Buffer)	July 2014		Tiger Conservation Plan for Buffer Zone sent in March 2021.
3	Pench (Core)	December 2007	2008-09 to 2017-18	No Tiger Conservation Plan prepared for 2018-19 onwards.
	Pench (Buffer)	October 2010	2015-16 to 2024-25	Available. 1 st Tiger Conservation Plan since notification of Pench (Buffer) in 2010, approved in 2015-16.
4	Sanjay (Core)	February 2011	Nil	1 st Tiger Conservation Plan since notification of Sanjay (Core) in February 2011 and Sanjay (Buffer) in May 2014, sent to National Tiger Conservation Authority for approval in November 2019. Reported as approved as of September 2020.
	Sanjay (Buffer)	May 2014		

¹⁸ Technical document: NTCA/01/07, a supplementary guideline was also issued by the National Tiger Conservation Authority in April 2014.

Sl. No.	Tiger Reserve	Date of Notification	Period of approved Tiger Conservation Plan	Remarks
5	Satpura (Core)	December 2007	2015-16 to 2024-25	Available
	Satpura (Buffer)	January 2011	2015-16 to 2024-25	Available
6	Bandhavgarh (Core)	December 2007	Nil	1 st Tiger Conservation Plan since notification of Core and buffer in December 2007 and October 2010 respectively, sent to National Tiger Conservation Authority in 2015. Yet to be approved by National Tiger Conservation Authority as of August 2020.
	Bandhavgarh (Buffer)	October 2010		

(Source: Forest Department)

Thus, activities taken up in the Divisions without the plans were ad-hoc in nature, i.e. they were not supported by long-term scientific planning, timeline for completion and properly identified targets. During Exit Conference, the Principal Chief Conservator of Forests /Wildlife assured us (July 2021) that the Department was reviewing the preparation of Plans, including fixing of timelines for preparation. He also informed that three Tiger Conservation Plans, viz. for Bandhavgarh Tiger Reserve, Panna Tiger Reserve and Sanjay Tiger Reserve, were under preparation.

Box 2.2: Importance of Tiger Conservation Plans: Bandhavgarh Tiger Reserve

The Bandhavgarh Tiger Reserve covers an area of 1,536.938 square kilometer and has a tiger population of 104 (Status of Tiger Report, 2018). A 65 per cent increase in Tiger population in Bandhavgarh Tiger Reserve during the period 2014-18 makes it one of the success stories in Tiger conservation. However, we noted that Bandhavgarh also registered 12 cases of deaths of Tigers due to territorial fights/cannibalism. 50 per cent of the total cases of Human-Wildlife Conflict in the State occurred in Bandhavgarh. In the absence of a Tiger Conservation Plan, measures to assess the spatial distribution of increasing density of tiger population to mitigate territorial fights, as well as mitigation measures, such as construction of chain-link fencing and watch tower, patrolling, etc., did not get the requisite focus.

Earlier, there was no wild elephant in the forests of Bandhavgarh Tiger Reserve. However, since 2018, few wild elephants have entered the Reserve and now reside there. These elephants damage agriculture crops in local villages and have even damaged Patrolling Camps.

The Bandhavgarh Management organised training programmes to sensitize field staff and villagers towards this new development. However, measures for improved corridor connectivity for elephants in the Tiger Reserve or formulation of management guidelines for viability of transient elephant population were not planned.

The Field Director, Bandhavgarh Tiger Reserve stated (October 2020) that efforts were being made to receive funds through Project Elephant for management of wild elephants. But in the absence of a Plan, these measures could not be prioritized.

2.2.2 Management Plans

In six¹⁹ out of the 13 National Parks and Wildlife Sanctuaries, the Management Plans were in place. In six, no plans were prepared after the expiry of the existing plans during the period of audit. The Gangau Wildlife Sanctuary did not have any plan during the entire period of audit.

Table 2.5 details the status of approved Plans in the audited units:

Table 2.5: Status of Management Plans in audited units

Sl. No.	National Parks/ Sanctuaries	Period of plan	Remarks
1	Phen Wildlife Sanctuary	2011-12 to 2020-21	Available
2	Ken Gharial Wildlife Sanctuary	2007-08 to 2016-17	No plan for two years from 2017-18 after expiry of past plan.
3	Gangau Wildlife Sanctuary	No plan after expiry of past plan: 2006-12	No Plan since 2012-13.
4	Bagdara Wildlife Sanctuary	2017-18 to 2026-27	No Management Plan for majority of audit period, i.e. 2014-15 to 2016-17.
5	Son Gharial Wildlife Sanctuary	2008-09 to 2018-19	Available
6	Madhav National Park	2007-08 to 2016-17	No Management Plan for two years from 2017-18 to 2018-19 after expiry of past plan.
7	Karera Wildlife Sanctuary	2008-09 to 2017-18	No Management Plan for one year (2018-19) after expiry of past plan.
8	Kuno National Park	2010-11 to 2019-20	Available
9	Van Vihar National Park	2012-13 to 2021-22	Available
10	Nauradehi Wildlife Sanctuary	2007-08 to 2016-17	No plan for two years from 2017-18 after expiry of past plan.
11	Ratapani Wildlife Sanctuary	2008-09 to 2017-18	No Management Plan for one year (2018-19) after expiry of past plan.
12	Singhori Wildlife Sanctuary	2012-13 to 2021-22	Available
13	Kheoni Wildlife Sanctuary	2007-08 to 2019-20	Available

(Source: Forest Department)

The PCCF/ Wildlife assured us (August 2019) that report would be sought from the field officers and reasons for delay would be examined.

We noted that there was no institutional mechanism to ensure that Plans are prepared in time. There was no dedicated staff for this work, nor were any timelines prescribed for the work. While the Divisions were already struggling with shortage of staff at different levels, the shortage being 41 *per cent* at the level of Range Officers and 52 *per cent* at the level of Deputy Range Officers (refer to Paragraph 3.5.2.1) making it further difficult for them to spare time for preparation of Tiger Conservation Plan/ Management Plan.

Box 2.3: Importance of dedicated staff

The Territorial Divisions which administer forest areas (other than Protected Areas) prepare Working Plans for a period of ten years for silviculture operations, i.e. for growing and cultivation of trees. These Working Plans form the basis for approval for felling from the Government of India. We noted that each Circle has a dedicated team headed by the PCCF/

¹⁹ Kheoni Wildlife Sanctuary, Kuno National Park, Phen Wildlife Sanctuary, Singhori Wildlife Sanctuary, Son Gharial Wildlife Sanctuary and Van Vihar National Park.

Working Plan at the State level, for preparation of such Working Plans. This ensures timely preparation of Plans.

2.2.3 Zonal Master Plans

As per the Environment (Protection) Act, 1986²⁰, the area around the Protected Areas should be identified and declared as ecologically fragile. These areas are to be notified by Government of India, on the basis of proposals from State Government²¹, as Eco-Sensitive Zones. These areas would also act as transition zones from areas of high protection to areas involving lesser protection. Based on the proposal/draft notification sent by the respective States, such areas that fall within two kilometers around the National Park and Wildlife Sanctuaries, as well the entire Buffer Area of the Tiger Reserves, are to be notified by the Government of India as Eco-Sensitive Zones.

We found that the State Government had identified a total of 35 Eco-Sensitive Zones in Madhya Pradesh, against which 30 were notified, adding an area of 9,437.53 square kilometer of Eco-Sensitive Zones between December 2016 and March 2021. Out of the 30 notified Eco-Sensitive Zones, 23 had not yet prepared Zonal Master Plan within the stipulated period of two years.

In the 24 Protected Areas sampled in audit, a total of 6,967.15 square kilometer were notified and Eco-Sensitive Zones in respect of 21²² Protected Areas had been issued. Four²³ out of these Eco-Sensitive Zones were notified recently between November 2019 and March 2021. We noted that the areas identified as Eco-Sensitive Zones were mainly the Buffer Areas around the Tiger Reserves. For Panna Tiger Reserve, Kuno National Park and Gangau Wildlife Sanctuary, even preliminary notifications have not been issued (January 2021).

In respect of the Eco-Sensitive Zones, the State Government has to prepare and approve a Zonal Master Plan²⁴ within a period of two years from the date of publication of final notification, in consultation with local people. The Zonal Master Plans involve multiple authorities, such as

²⁰ As per Paragraph III (6) of 2nd National Wildlife Action Plan (2002-16) under the power conferred on the Central Government by sub-section (1) clause (v) and clause (xiv) of sub-section (2) and sub-section (3) of section 3 of the Environment (Protection) Act, 1986 (29 of 1986), read with sub-section (3) of rule 5 of the Environment (Protection) Rules, 1986. The Ministry of Environment, Forest and Climate Change had issued directions in this regard in February 2011 and September 2014.

²¹ As per Ministry of Environment, Forest and Climate Change Guidelines for declaration of Eco-Sensitive Zones (February 2011), a committee comprising of Chief Wild Life Warden, an ecologist, and one official each from Local Self Government and Revenue Departments would suggest the extent of the Eco-Sensitive Zone area for the Protected Areas, the requirements of such area to act as a shock absorber, best method for management of the zone and broad-based thematic activities to be included in the Master Plan for the area. The Chief Wild Life Warden will group these activities into the categories of prohibited, restricted and permissible activities and send the final proposal to Ministry of Environment, Forest and Climate Change for further processing and notification.

²² Bagdara, Bandhavgarh, Bori, Kanha, Karera, Ken Gharial, Kheoni, Madhav, Nauradehi, Pachmari, Panpatha, Pench and Pench Mowgli, Phen, Ratapani, Singhori, Sanjay, Sanjay Dubri, Satpura, Son Gharial and Van Vihar,

²³ Pench and Kanha National Parks, Pench Mowgli and Phen Wildlife Sanctuaries.

²⁴ The Zonal Master Plans shall provide for restoration of denuded areas, conservation of existing water bodies, management of catchment areas, ground water management, soil and moisture conservation and regulation of development in Eco-Sensitive Zones, so as to ensure eco-friendly development for livelihood security of local communities.

State Departments of Environment, Forest and Wildlife, Agriculture, Revenue, Urban Development, Tourism, Panchayati Raj and Public Works Department. Hence, it is a time-consuming work. No Zonal Master Plans were prepared in respect of 21 notified Eco-Sensitive Zones in selected divisions and 17 out of these 21 Zonal Master Plans are overdue by more than two years beyond their stipulated period.

Due to these lapses, the prohibition and regulation of activities which were envisaged in the notification of Eco-Sensitive Zones could not be implemented.

During the Exit Conference, the PCCF/ Wildlife stated (July 2021) that draft notifications of Eco-Sensitive Zones are under submission to Government of India for approval and the Zonal Master Plans for notified Eco-Sensitive Zones are in advanced stages of preparation. These are expected to be approved by the State Government within the next four to five months.

Consequence of the delays is that prohibition/ regulation of various activities in Eco-Sensitive Zones could not be done and conservation activities could not be properly implemented.

Box 2.4: Case for planning: Inter-state co-ordination

The Pench, Kanha and Sanjay Tiger Reserves, the Kuno National Park and the Bagdara Wildlife Sanctuary variously share common boundaries with Maharashtra, Chhattisgarh, Rajasthan and Uttar Pradesh. Security Plans of the Pench and Kanha Tiger Reserves recognized the threats from criminals of adjoining States and factored in suitable counter-measures, such as joint patrolling, intelligence sharing, monitoring of public places and markets near the borders, etc. The eastern boundary of Kanha Core Tiger Reserve is not surrounded by the Buffer Zone as it lies in Kawardha District of Chhattisgarh State. As per the Tiger Conservation Plan of Kanha Tiger Reserve, the Park Management and Kawardha Division would jointly patrol and share information for better co-ordination for this purpose, for which yearly rosters were also prepared.

These measures were absent in Bagdara Wildlife Sanctuary despite the fact that areas in adjoining State of Uttar Pradesh were noted to be sensitive to poaching and grazing. The joint patrols were also absent in Sanjay Tiger Reserve and in Kuno National Park. The Tiger Conservation Plan of Pench Tiger Reserve envisaged periodical joint monitoring of markets and other public places and monitoring of persons engaged in illegal activities in nearby areas of Maharashtra. An institutional mechanism for the same was however missing.

The State Government agreed (September 2021) to the observation.

Management of Corridors

Connecting habitats, apart from facilitating animal movements, also act as refuge for spill-over populations from the Core Areas. An indicative plan for management of corridors may be prepared along with the Tiger Conservation Plan, which is to be implemented by the Chief Wild Life Warden.

The number of Tigers in Madhya Pradesh increased from 308 to 526, i.e. 71 per cent, between 2014 and 2018, which was the highest from any State in the country. Thus, there was greater need for safe dispersal of Tigers and wildlife in new areas.

The National Tiger Conservation Authority and the Wildlife Institute of India identified Tiger Corridors in 2014 between Protected Areas of Madhya Pradesh on one hand and Chhattisgarh, Maharashtra and Rajasthan on the other, for maintaining genetic diversity and provide dispersal for young Tigers. Seven of them are related with the audited Divisions, as shown in **Table 2.6** below:

Table 2.6: Wildlife Corridors in the State as per Wildlife Institute of India

Sl. No.	Corridor	Protected areas	States involved
1	Kanha-Pench	Kanha Tiger Reserve-Pench Tiger Reserve	Madhya Pradesh
2	Kanha - Navegaon-Nagzira-Tadoba-Indravati	Kanha Tiger Reserve, Boramdev Wildlife Sanctuary, Navegaon-Nagzira Tiger Reserve, Tadoba-Andhari Tiger Reserve and Indravati Tiger Reserve	Madhya Pradesh, Chhattisgarh, Maharashtra and Andhra Pradesh (now Telangana)
3	Kanha-Achanakmar	Kanha Tiger Reserve, Phen Wildlife Sanctuary, Achanakmar Tiger Reserve, Boramdev Wildlife Sanctuary	Madhya Pradesh and Chhattisgarh
4	Pench- Satpura-Melghat	Pench Tiger Reserve, Satpura Tiger Reserve, Melghat Tiger Reserve	Madhya Pradesh and Maharashtra
5	Ranthambore-Kuno-Madhav	Ranthambore Tiger Reserve, Kuno National Park, Madhav National Park	Madhya Pradesh and Rajasthan
6	Bandhavgarh-Sanjay-Dubri-Guru Ghasidas	Bandhavgarh Tiger Reserve, Sanjay Tiger Reserve, Guru Ghasidas National Park	Madhya Pradesh and Chhattisgarh
7	Bandhavgarh-Achanakmar	Bandhavgarh Tiger Reserve, Achanakmar Tiger Reserve	Madhya Pradesh and Chhattisgarh

(Source: Tiger Corridor Report by Wildlife Institute of India, 2014)

40 out of the 80 Tiger death cases in selected divisions during 2014-18, constituting 50 percent of the total were due to infighting and cannibalism, as mentioned in Paragraph 3.1.1. It is highly likely that the deaths were due to decreased opportunity available for movement of spill-over populations from the Core Areas. Sufficiently and adequately managed corridors are of utmost importance for gene flow and further increase in population of wild animals in the State.

Significance of all these corridors in wildlife conservation and management efforts of the Forest Department are given in **Appendix 2.1**.

In reply, the Field Directors of Bandhavgarh, Pench and Satpura Tiger Reserves stated that management of corridors was being done by respective Territorial Divisions. The Field Director, Pench Tiger Reserve further stated that the Indicative Plan for Corridors have not been approved by the National Tiger Conservation Authority. The Field Director, Kanha Tiger Reserve stated that funds had been provided to Territorial Divisions during 2019-20 for undertaking conservation works while the Field Director, Sanjay Tiger Reserve stated that plan would be prepared and implemented as per directions of PCCF/ Wildlife. The Director, Madhav National Park stated that a plan for 10 years period was sent (May 2005) to the PCCF/ Wildlife, which was not approved.

These important corridors in the State were being managed by the respective Territorial Divisions with the predominant objective of silviculture²⁵ operations. We did not find evidence

²⁵ The growing and cultivation of trees.

of close co-ordination of Tiger Reserves with the Territorial Divisions on implementation of the indicative plans.

The State Government agreed (September 2021) to the observation.

2.2.4 Elements covered in Plans

There is no standard format for preparing the Management Plans for Protected Areas approved by Ministry of Environment, Forest and Climate Change. However, a format was devised by Shri V.B. Sawarkar of the Wildlife Institute of India in the year 2002, which took into consideration all possible elements of a comprehensive Management Plan. While it has no statutory authority regarding its compliance and is merely advisory in nature, many Protected Areas across the country follow it. States like Karnataka, with very high Tiger and Elephant population and rich presence of flora and fauna, follow it to a large extent. However, barring few outliers, like Nauradehi Wildlife Division, no other Protected Areas in Madhya Pradesh follow the Sawarkar Guidelines to prepare their Management Plans.

We noted that the Management Plans did not comprehensively cover all aspects of planning (**Appendix 2.2**). Main themes that did not find mention in the Plans are at **Table 2.7**:

Table 2.7: Themes of planning not covered in Management Plans

Sl. No.	Themes	Name of Protected Area
1	Research areas were not identified	Ratapani Wildlife Sanctuary, Kuno National Park and Madhav National Park.
2	Budget requirements were not assessed	Ratapani Wildlife Sanctuary, Kuno National Park
3	Detailed plans for patrolling and their monitoring was not prescribed	Ratapani Wildlife Sanctuary, Kuno National Park, Nauradehi Wildlife Sanctuary and Karera Wildlife Sanctuary.
4	Management of existing Tiger corridors with other adjoining Protected Areas were not planned.	Madhav National Park and Nauradehi Wildlife Sanctuary.
5	Possible impact of climate change on ecosystem and biodiversity not discussed	Not discussed in any of the Management Plans of audited Protected Areas
6	Measures to reduce possibility of genetic swamping	Not discussed in any of the Management Plans of audited Protected Areas

2.3 Research

The Management Plans and Tiger Conservation Plans constitute tools to review the baseline data to assess the impact of conservation efforts.

Box 2.5: Research findings with reference to plan

A study in 2019 in Son Gharial Wildlife Sanctuary highlighted problems in conservation of Gharials (such as inadequate population of male Gharials). The findings and suggestions of the Study Report were included in the Management Plan of the Sanctuary for the period 2020-21 to 2029-30.

Research activities are a source of such data and form an important part of the plans. Applied research helps to overcome specific management problems in Protected Areas²⁶.

²⁶ Parameter VI of 2nd National Wildlife Action Plan, 2002-16.

Even when research topics are identified in the Plans, our audit showed that there was no institutional mechanism to cause such research to be conducted. We did not find on record institutional tie-ups with reputed institutes or researchers for conducting research in a time-bound manner. Research activities are allowed to be funded by the Development Fund (entry charges receipts) but we found that it was used only in Pench Tiger Reserve (refer Box 2.7). In addition, Managements can place demands for fund for research in the Annual Plan of Operations. Only the three Tiger Reserves at Panna, Sanjay and Kanha sanctioned funds (₹ 1.12 crore) in 2014-15 and 2017-18 for research. The funds released were not used, resulting in savings of 96.6 per cent in Kanha and 100 per cent savings in the other two Tiger Reserves.

Box 2.6: Critical research not taken up

One of the areas of research in Tiger Conservation Plan of Kanha Tiger Reserve 2011-21 was on poaching: *modus operandi*, magnitude, crime intelligence and networking. The research was not taken up. Poaching continues to be a major challenge with 102 cases of poaching and seizure of Tigers and Leopards in the State during 2014-18. Paragraph 3.1.1 in this Report refers to poaching.

We noted that Management Plans and Tiger Conservation Plans are not made freely available to public (although not classified information) through a formal notification or through their websites. As a result, only those who would be in touch with the Department and very closely monitoring the preparation of these Plans would get to know the topics proposed for research in them. Out of 178 themes proposed in three²⁷ Tiger Conservation Plans and 28 in Management Plan of two²⁸ Protected Areas, researches only in two topics were selected by that too only in Pench Tiger Reserve.

The alternative stream of research is through researchers who contact the Management for requisite permissions to conduct research in areas identified by the researchers themselves. Such requests are often permitted by the PCCF/ Wildlife under condition that the findings of the research (interim and final reports) should be shared with the Forest Department. 74 such topics were proposed independently by researchers and permitted to be taken up by the Department. But these permissions did not contain any time-line for completing the research. The Department also had no mechanism to track the status of the research or to ensure that the research findings were indeed shared.

Box 2.7: Status of Research Planned

Case Study 1: Pench Tiger Reserve

A total of 54 research topics were included in the Tiger Conservation Plan for Pench Core: 2008-2018, on three broad areas, viz., values relating to Protected Areas (34 topics), study of wetland (Totladoh Reservoir: three topics) and biotic pressures on Protected Areas (17 topics).

²⁷ Kanha, Pench and Satpura

²⁸ Bagdara Wildlife Sanctuary and Kheoni Wildlife Sanctuary

The Field Director entered into two agreements (2016) with Government agencies for research on two²⁹ of the 54 topics proposed in the Plan. Although ₹ 7.20 lakh was released from Development fund for the research, we did not find the reports against the research on record.

Another 14 topics were taken up for research during 2014-19 by individual researchers based on their own proposals, i.e. outside of the list of 54 activities proposed by the Department. Save two³⁰ reports, we did not find any of the reports, either interim or final, on record, as of September 2019.

The Field Director, Pench Tiger Reserve stated (September 2019) that research on poaching, fire, eco-tourism and wildlife diseases had been planned and that two other research activities on Wetland and Biotic pressure are also proposed. He further stated that research work would be done in future. However, we did not find such plan on record.

Case Study 2: Kanha and Satpura Tiger Reserves

Similarly, a total of 124 topics were included in the Tiger Conservation Plans of Kanha and Satpura Tiger Reserves. The Tiger Reserves did not cause the research to be conducted but individual researchers took nine topics for research during 2014-19, besides 51 other topics outside the 124 topics identified in the Plans. Only nine of those 60 researchers submitted their final reports to the Department, while none of the others submitted even their interim reports to Kanha and Satpura Tiger Reserves till January 2020 and September 2020 respectively.

The other three Tiger Reserves (Bandhavgarh, Sanjay and Panna) did not prepare their Tiger Conservation Plans during the audit period.

We noted that the Management Plans of six Protected Areas³¹ had not envisaged any research activity. The Management Plan of Kheoni Wildlife Sanctuary identified a total of 11 research activities. The Divisional Forest Officer stated (September 2020) that these could not be implemented due to lack of funds. We were not provided evidence to show that these funds were demanded. Similarly, Field Director, Sanjay Tiger Reserve had not planned or taken up study of any of the 17 topics proposed in the approved Management Plan (2017-27) in Bagdara Wildlife Sanctuary, the Field Director stated (November 2019) that the Management Plan (2017-18 to 2026-27) was new and the proposed activities would be taken up in future.

On the other hand, we found nine³² research activities conducted by researchers in four

²⁹ (i) Study on human-wildlife conflict due to crop raiding in the areas enclosing Pench Tiger Reserve and suggesting mitigation measures (ii) Studies on lantana toxicity in small wild herbivores of Pench Tiger Reserve.

³⁰ 'Phase-IV monitoring of prey of Tigers' and 'Inter birth interval and litter size of free ranging Bengal Tiger in dry deciduous tropical forest of India'.

³¹ Karera Wildlife Sanctuary, Kuno National Park, Madhav National Parks, Nauradehi Wildlife Sanctuary, Ratapani Wildlife Sanctuary and Singhori Wildlife Sanctuary.

³² True Bugs from Nauradehi Wildlife Sanctuary, Predator encounter between orb-weaver spiders of genus Neoscona Simon and some Odonates, Case study from Nauradehi Wildlife Sanctuary and Preliminary investigation on Spider fauna, "Ecological Status of Ratapani Wildlife Sanctuary" Raisen, Analysis of Potential Outcome-based Indicators for assessing the Biodiversity status of Managed Forests: A case study of Delawari Range, Ratapani Wildlife Sanctuary, Hemiptera fauna of Ratapani Wildlife Sanctuary, A Policy Framework for Connectivity Conservation and Smart Green Linear Infrastructure Development in the Central Indian and Eastern Ghats Tiger Landscape, A Potential site for Vulture in Bundelkhand Region, Estimating Leopard abundance in Kuno National Park.

Divisions³³ in open platforms and in websites, but they remained unknown to the Managers.

The State Government agreed (September 2021) to the observation.

Box 2.8: Critical research area unaddressed: Sanjay Tiger Reserve

324 Chitals were translocated to Sanjay Tiger Reserve during 2014-19 for increasing prey base in it. Observing the low breeding rate of reintroduced Chital in the Tiger Reserve, the Field Director sent a proposal for research in December 2016 to Chief Wild Life Warden to identify the reasons. This research was not conducted as of November 2019.

The PCCF/ Wildlife stated (July 2019) that Chital will take time to acclimatise in the new habitat and there was no problem which needed study. However, the Monitoring Effectiveness Evaluation Report, 2019 by National Tiger Conservation Authority stressed the need for review of Chital breeding by technical institute.

Inadequate focus on research that could feed into the planning of conservation efforts, was a challenge that deserves attention of the Government. As a result, timely course-corrections through management interventions could not be adopted and the conservation endeavours undertaken could not be revisited in the light of possible research findings.

The State Government agreed (September 2021) to the observation.

2.4 Funding conservation

Protected Areas receive funds under Centrally Sponsored Scheme (CSS) from the Ministry of Environment, Forest and Climate Change, Government of India against requests for grants from the State Government. The State Government also provide budget under Schemes such as National Park, Compensation for Human Casualty by Wild Animals, Compensation for Relocation of Villages, and Wildlife Management outside Protected Areas. Further, funds were also sanctioned under Development Fund and the Compensatory Afforestation Fund.

During the period 2014-19, a sum of ₹ 633.32 crore was spent under the Centrally Sponsored Scheme and ₹ 1,265.92 crore under the four State Schemes in the State, as shown in **Table 2.8** below:

Table 2.8: Expenditure under Central and State Schemes

		(₹ in crore)
Sl. No.	Name of the Scheme	Expenditure
1	Centrally Sponsored Scheme	633.32
2	State Schemes	
1	National Park	483.37
2	Compensation for Human Casualties by Wild Animals	50.01
3	Compensation for Relocation of Villages	642.47
4	Wildlife Management outside Protected Areas	90.07
Total		1265.92

(Source: Appropriation Accounts)

³³ Kuno National Park, Madhav National Park, Nauradehi Wildlife Sanctuary and Obedullaganj Division.

2.4.1 Centrally Sponsored Scheme

Status of sanction and expenditure during 2014-19 under the Centrally Sponsored Scheme in selected Tiger Reserves and Protected Areas is given in **Table 2.9** below:

Table 2.9: Sanctioned amount, expenditure and savings under the Centrally Sponsored Scheme

(₹ in crore)							
Year	Sanctioned Amount	Month of Sanction	Deducted Amount ³⁴	Net sanctioned Amount	Expenditure	Saving (5-6)	Percentage of Saving
1	2	3	4	5	6	7	8
2014-15	68.86	May-Nov 2014	1.85	67.00	61.04	5.96	8.90
2015-16	33.33	June – Sep 2015	0.58	32.75	30.31	2.44	7.24
2016-17	280.95	June – Sep 2016	1.46	279.49	194.79	84.70	30.30
2017-18	246.57	May - Sep 2017	16.53	230.04	221.65	8.39	3.65
2018-19	125.58	Jul 2018 - Jan 2019	12.40	113.18	98.09	15.09	13.33
Total	755.29		32.82	722.46	605.88	116.59	16.14

(Source: Forest Department)

- A sum of ₹ 116.59 crore (16.1 per cent) remained unspent against net sanction of ₹ 722.46 crore. This led to deduction of ₹ 32.82 crore from the sanctions for the following year. Savings remained under 14 per cent except in 2016-17 mainly because ₹ 75.50 crore received for relocation of villages for Sanjay Tiger Reserve, could not be utilized;
- We checked activity-wise expenditure and found that out of a total of 2,258 activities undertaken in the sampled six Tiger Reserves and 13 Protected Areas during 2014-19, there was 50 to 100 per cent savings in 387 activities, such as cause-way construction, dyke construction, research activities, wireless maintenance, procurement of vaccines, health camps, check-dam constructions, meadow development etc.;
- During the period 2014-19, only ₹ 755.29 crore was sanctioned by Ministry of Environment, Forest and Climate Change from Centrally Sponsored Scheme against the demand of ₹ 947.81 crore in Annual Plan of Operations of six Tiger Reserves and 13 Protected Areas. Thus, there was a shortfall of ₹ 192.52 crore against the demands by the Divisions.

The Managers of these Tiger Reserves/ Protected Areas largely attributed the savings to delay in sanction of the funds by Government of India during the year and restrictions imposed by the Government on payments for certain activities.

Reply is not acceptable as the funds were normally received by September every year (in 32 out of 35 sanctions during 2014-19). Further, the restrictions on spending imposed by the Finance Department of the State Government in the last quarter of the year, do not apply to the Central Schemes.

The State Government agreed (September 2021) to the observation.

³⁴ Deducted amount is unspent amount of previous year which was not revalidated for succeeding year.

2.4.2 Annual Plan of Operations

We noted that Annual Plan of Operations for all the sampled Divisions were submitted to the Government of India. However, the funds were not demanded for some activities in the Annual Plan of Operations for the period of 2014-19 although included in the Tiger Conservation Plan and Management Plans. For instance, in Kanha Tiger Reserve, funds were not demanded for Amelioration of Meadows and Eco-development works, though these were included in the Tiger Conservation Plan (2011-21). Similar instances of exclusion of activities from the Annual Plan of Operations although included in the Management Plans, were found in Bagdara Wildlife Sanctuary, Nauradehi Wildlife Sanctuary and Madhav National Park.

The Department had other sources, such as Development Funds, Compensatory Afforestation Fund and State Budget, from which it could feed the activities which had not received sanctions under the Centrally Sponsored Scheme. But there was no mechanism to ensure that operations (included in the Tiger Conservation Plan/Management Plan) which did not receive sanctions under the Centrally Sponsored Scheme, were funded through other sources. As a result, the Department could not assure that Tiger Reserves/ Protected Areas were managed according to the prescriptions in the Tiger Conservation Plan/ Management Plan. The State Government agreed (September 2021) to the observation.

Box 2.9: Management of Feral Cattle in Kuno National Park

One of the problems faced in the Kuno National Park was of herds of feral cattle left behind by the villagers of relocated villages, which began to feed themselves on grasslands leading to increase in thorn bushes and weeds. To overcome this situation, the Management Plan prescribed measures such as fencing of the yarding sites of the feral cattle.

However, the Management did not demand funds for the activities. We also noted that the Kuno National Park is a selected site for introduction of Lion and African Cheetah. The problem of over-grazing could lead to paucity of food for herbivores which will impact the population of their predators.

The Divisional Forest Officer, Kuno National Park assured (September 2019) that the prescriptions of Management Plan on feral cattle would be implemented.

2.4.3 Utilisation of funds for protection of biodiversity and wildlife in Protected Areas concerned in cases of land diversion

In addition to funds under Centrally Sponsored Scheme and State schemes, the Department spent ₹ 198.10 crore against receipts under the Development Fund (Entry Fee) and ₹ 163.23 crore under the Compensatory Afforestation Fund during 2014-19.

As per the Hon'ble Supreme Court orders in October 2002³⁵ and Sub Section 3 (IV) of Section 4 of Compensatory Afforestation Fund Act, 2016, money recoverable from user agencies shall be credited into the Compensatory Afforestation Fund of a State for undertaking activities relating to the protection of biodiversity and wildlife in cases of diversion of forest land under

³⁵ Order dated 30 October 2002 in IA No. 566 in WP(C) No. 202/1995.

Protected Areas. Five *per cent* of the project cost was to be charged for undertaking activities related to protection of biodiversity and wildlife.

However, based on a proposal (December 2017) of the PCCF/ Wildlife, the State Wildlife Board decided (December 2017) that due to delays in processing of funds, the money would be deposited in the accounts of Madhya Pradesh Tiger Foundation Society³⁶, instead of depositing it in the Compensatory Afforestation Fund. The Society is, however outside the audit purview of the Comptroller and Auditor General of India.

We noted that ₹ 32.92 crore received in nine Divisions³⁷ between December 2017 and December 2018 was deposited in the Madhya Pradesh Tiger Foundation Society accounts. PCCF/ Wildlife did not produced to us records relating to sanctions of the funds and expenditure and hence, we could not ascertain whether the funds were utilised for intended purposes only.

In reply, the State Government stated (July 2021) that the levy of a maximum five *per cent* amount was additional to that being deposited in the Compensatory Afforestation Fund. The reply is in contravention to the orders of Hon'ble Supreme Court and provisions of Compensatory Afforestation Fund Act on depositing such money into the Compensatory Afforestation Fund.

2.5 Recommendations

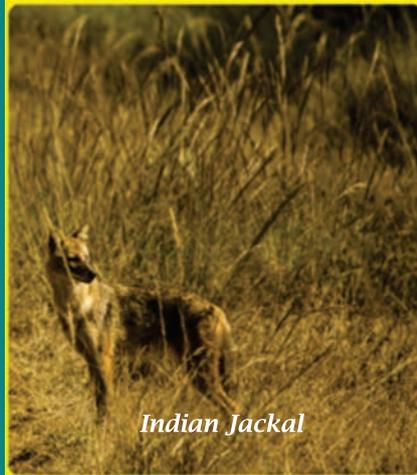
In view of the findings above, we recommend the following:

1. *The Forest Department may support preparation of Tiger Conservation Plans/ Management Plans through dedicated team, and a laid down process along with comprehensive Guidelines for preparation of Management Plans may also be prescribed;*
2. *The State Government may ensure preparation and approval of Zonal Master Plans in a time-bound manner and ensure monitoring of activities included therein in an effective manner;*
3. *The Department may establish institutional tie-ups to cause research in areas identified in the Tiger Conservation Plans/ Management Plans;*
4. *The Department may put in place a monitoring tool that tracks allocation and utilisation of funds on each activity identified in the Tiger Conservation Plans/ Management Plans.*

³⁶ A society working under Madhya Pradesh Forest Department for conservation of Tigers.

³⁷ Bandhavgarh Tiger Reserve, Pench Tiger Reserve, Sanjay Tiger Reserve, Satpura Tiger Reserve, Dewas Division, Madhav National Park, Nauradehi Division, Damoh Division and Obedullaganj Division.

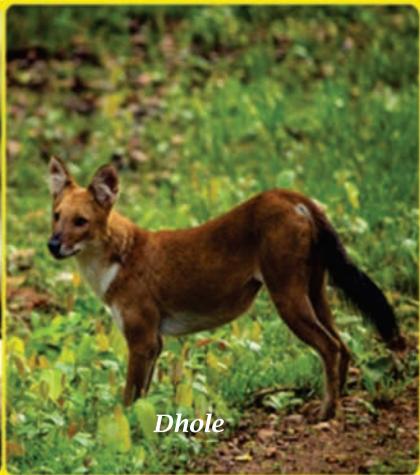
Chapter 3
Conservation and Protection of Wildlife



Indian Jackal



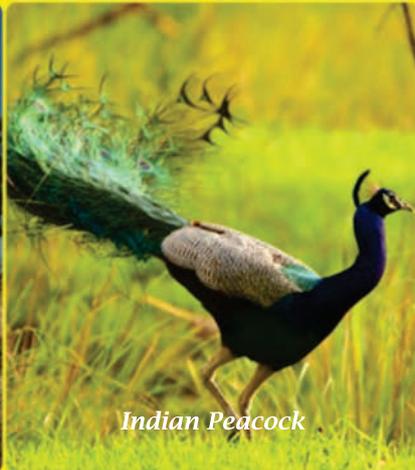
Indian Giant Squirrel



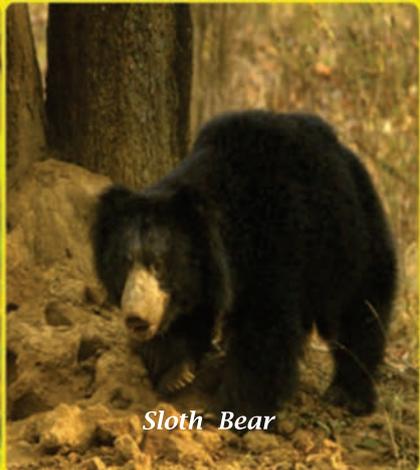
Dhole



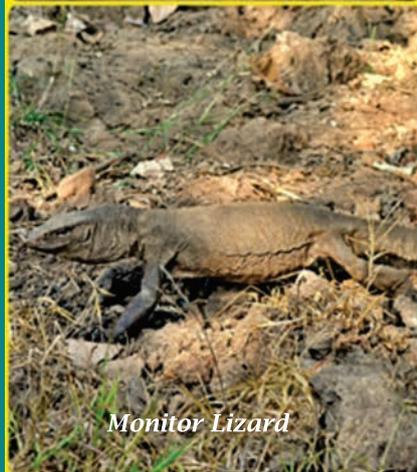
Spectacled Cobra



Indian Peacock



Sloth Bear



Monitor Lizard



Indian Soft Shell Turtle



Indian Jackal

Photo courtesy (From top, left to right):
Varun Mani, Bhopal Birds, Varun Mani
Sanjay Shukla, Abhinandan Shukla, Varun Mani
Abhinandan Shukla, Abhinandan Shukla, Sachin Matkar

Chapter 3

Conservation and Protection of Wildlife

Summary

We found that the number of Tigers increased by 71 *per cent* to reach 526 in the 2018 Tiger census, which was the highest in any State in the country. However, there were mixed results in conservation of other endangered species due to inadequacies in planning for translocation and monitoring. Increasing Human-Wildlife Conflict has caused destruction of wildlife and generated animosity against wild animals and Protected Areas. The ground situation showed increasing trend in cases of Human-Wildlife Conflicts due to lack of prescribing and implementing site-specific measures to minimise the conflicts. Translocation is a wildlife conservation measure which require the capture, transport and release of a species from one location to another. Our audit found that in the case of inter-state translocation of two Tigers to Satkosia Tiger Reserve in Odisha, protection measures at the new site was not ensured before translocation. This resulted in loss of one Tiger and the other Tiger also could not adopt to conditions at the new site. However, the Department has been successful in translocation of Tigers in Sanjay Tiger Reserve, Panna Tiger Reserve and Nauradehi Wildlife Sanctuary.

The Special Tiger Protection Force in three selected Tiger Reserves (Bandhavgarh, Kanha and Pench) was not established by the State Government despite being stipulated in the tripartite agreement (2009-2010) between the National Tiger Conservation Authority, the Government of Madhya Pradesh and the Forest Department. The processes of assessments and distribution of Arms and Wireless sets were deficient and Metal Detectors were not used in routine patrolling.

The security threats to wildlife include poaching, encroachments, electrocution, poisoning, snare, accidents on roads and railway lines, etc. 115 Tiger deaths and 209 Leopard deaths were reported between 2014 and 2018 due to various reasons³⁸. Poaching and seizures contributed to 19 *per cent* of the total Tiger and Leopard deaths in the sampled divisions during 2014 to 2018. Causative factors on poaching specially the high incidence in Balaghat district, were not analysed to aid a suitable plan for its reduction. Retrofitting measures against linear infrastructure, like roads and railway lines was also not found to be adequate.

The Forest Departmental officials have been vested with power to register forest offence cases, investigate and take legal action. We noted a reduction in pending forest offence cases, as well as new registered cases, aided by welcome progress in investigation. However, about 20 *per cent* of total investigated cases were still pending after investigation for compounding or to be taken to Court.

Eco-tourism provides an opportunity to link a Protected Area to a wider population and helps in building support for conservation. However, it was evident that excessive tourism was affecting the stress levels of wildlife in Tiger Reserves due to violation of National Tiger Conservation Authority's directions in this regard.

³⁸ Territorial fights, Electrocution, Poisoning, Disease, Accidents, Snare, etc.

Disease control is also essential for timely action to prevent disease outbreaks and control large-scale mortality. Cattle are the major source of such diseases, followed by dogs. We noted that the Forest Department has not established an effective co-ordination mechanism with Animal Husbandry and Dairy Department to obtain data of total cattle to be vaccinated in villages around the Protected Areas. In the absence of data on available cattle, we could not draw assurance on their vaccination in Protected Areas. There was no staff to carry out immunisation of cattle and dogs in and around the National Parks and Wildlife Sanctuaries, and survey of the parasitic and infectious diseases periodically. We noted that except in Panna Tiger Reserve, immunisation of dogs and cats were not done against the threat of Canine Distemper Virus.

Wildlife conservation encompasses myriad activities.

This Chapter has been segregated into six parts to cover major activities involving mortality of wildlife; investigation and action on wildlife offences; mitigating safety measures; administrative measures for tiger conservation; resourcing conservation; and other issues affecting conservation efforts.

Box 3.1: Status of Tiger conservation

Being at the top of the food chain, a viable population of Tigers also ensure viable populations of co-predators, prey and forest, thereby ensuring the ecological viability of the entire area or habitat³⁹.

With a Tiger population of 308 in 2014, Madhya Pradesh slumped from the top spot in the country in 2006 to third in 2014. However, in 2018, the number of Tigers increased by 71 *per cent* to reach 526 which was the highest for a State in the country. The highest increase was noted in Bandhavgarh Tiger Reserve where the number of Tigers rose to 104 in 2018 from 63 (65 *per cent* increase) in 2014, this to be followed by Satpura (54 *per cent* increase) and Panna (47 *per cent* increase) Tiger Reserves.

The Panna Tiger Reserve is situated in the northern-most area of Central India. By the year 2009, the entire population of the Tigers was eliminated from Panna Tiger Reserve. The Tiger reintroduction programme was started in November 2009 and as per the 2018 Tiger Census, the Tiger Reserve was filled with 25 adult Tigers, making it a success story.

The National Tiger Conservation Authority conducted audit of 50 Tiger Reserves in the country under the framework of Management Effectiveness Evaluation in 2018 under various criteria of framework elements: context, planning, inputs, process, outputs and outcomes. Three Tiger Reserves in Madhya Pradesh, i.e., Pench, Kanha and Satpura, obtained Management Effectiveness Evaluation score between 93.75 and 90.63 *per cent* and were ranked among the top four Tiger Reserves in the country.

But we noted that neither Bandhavgarh nor Panna Tiger Reserves had a Tiger Conservation Plan since December 2007. So, while currently the increasing number of tigers showed the existence of a healthy forest, the future of these Protected Areas depend on strategic planning on critical areas such as the ideal number of Tigers that limited space can optimally sustain,

³⁹ Para 7.3.2 of Comprehensive Guidelines on Tiger Conservation and Tourism, issued by National Tiger Conservation Authority, October 2012.

and how they would cope with continuously increasing tiger densities within their non-expanding jurisdictions, and consequent territorial fights, prey scarcity, possible inbreeding being some key areas.

3.1 Mortality of Wildlife

Poaching and illegal trade in wild animals has emerged as one of the most serious threats to wildlife in the country.



Electrocuted Tiger in Kanha (Buffer) Tiger Reserve (October 2016)

Tiger died due to drowning in Pench Tiger Reserve (January 2016)

3.1.1 Incidence

Tiger mortality

During the period 2014-18⁴⁰, a total of 115 Tiger death cases were reported in the State. Out of the audited 13 Divisions, 80 Tiger death cases were reported in seven Divisions, constituting 70 per cent of the total cases in the State, as shown in **Table 3.1** below:

Table 3.1: Reported cases of Tiger deaths during 2014 to 2018

Sl. No.	Division	Poaching/seizure ⁴¹	Territorial Fights ⁴²	Diseases	Others ⁴³	Total cases
1	Bandhavgarh Tiger Reserve	5	12	3	5	25
2	Kanha Tiger Reserve	4	21	1	4	30
3	Pench Tiger Reserve	3	5	1	3	12
4	Panna Tiger Reserve	1	1	0	3	5
5	Three other Divisions ⁴⁴	3	1	1	3	8
	Total	16	40	6	18	80

(Source: Forest Department)

Thus, Kanha and Bandhavgarh Tiger Reserves had the highest Tiger mortality during 2014 to 2018, constituting nearly 70 per cent of the total Tiger deaths in these seven Divisions. Within that, Kanha and Bandhavgarh Tiger Reserves had 70 per cent and 48 per cent mortality due to territorial fights during 2014 to 2018. Thus, territorial fights constitute the main challenge with regard to tiger mortality. A Research⁴⁵ paper published in 'Journal of Recent Sciences, 2015',

⁴⁰ The data is captured annually (January to December), hence 2019 figure are not included in this Chapter.

⁴¹ Seizure of dead remains of a wild animal in possession of any person or in a place.

⁴² Territorial fights/ cannibalism.

⁴³ Others include death of orphan cubs, natural deaths, train accident, drowning and old age cases.

⁴⁴ Obedullaganj Division, Sanjay Tiger Reserve and Satpura Tiger Reserve.

⁴⁵ 'Causes and Consequences of Tiger Mortality in Corbett Tiger Reserve' by Sanjeev Kumar.

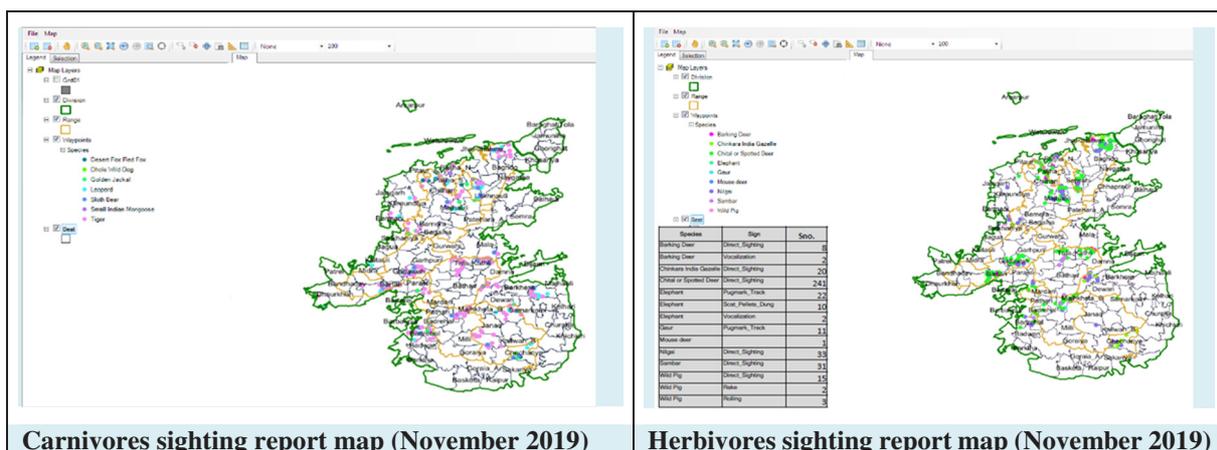
identified depletion of food leading to struggle within same species, as a causative factor for territorial fights. Fighting cases are observed in the mating season too, between November and February. We also noted that during 2014 to 2018, 13 out of 33 cases of territorial fights and cannibalism occurred in Bandhavgarh and Kanha Tiger Reserves between months of November to February constituting 39 per cent of total cases. Higher numbers of territorial fights in Kanha and Bandhavgarh Tiger Reserves could also be attributed to the high concentration of prey base in some pockets where food and water are available.

Box 3.2: Use of M-STriPES

M-STriPES⁴⁶ system is a tool for data-collection developed by the National Tiger Conservation Authority. M-STriPES produces reports and maps synthesizing information on illegal activities, wildlife crime, protection efforts and ecological status at desired temporal and spatial scales. Maps generated through this system are sent to the PCCF/ Wildlife on monthly basis by all the Tiger Reserves.

We examined these maps in the selected Tiger Reserves. An illustrative example of Bandhavgarh Tiger Reserve is reproduced below, where the pink and green dots show the sightings of carnivores and herbivores respectively:

Map 3.1: Location of Carnivore and Herbivores sightings in Bandhavgarh Tiger Reserve



We noted from the Reports that the carnivores and herbivores sightings repeatedly occurred in the same pockets only, possibly due to lack of suitable habitat, food and forage in other areas. Such concentration of wildlife at specific spots can lead to both territorial fights, as well as allow poachers to make easy kills. It may be recalled that 12 Tigers had died in Bandhavgarh Tiger Reserve due to territorial fights and five on account of poaching/ seizure (refer to Table 3.1 in Paragraph 3.1.1) during 2014 to 2018. However, there was nothing on record to show that the inputs from M-STriPES as above were used for such analysis.

In reply, the PCCF/ Wildlife stated (July 2020) that prey concentration is found along the forests in plains, grasslands and riparian areas, and hence the Tiger density is higher in these

⁴⁶ Monitoring system for Tigers- intensive protection and ecological status, a mobile application based monitoring system developed by National Tiger Conservation Authority presently used in Tiger Reserves only.

areas. Lesser use of certain areas by Tigers is thus not a consequence of lack of management interventions.

However, there was nothing on record to show that the Department had used M-STrIPES data for fine tuning its interventions.

In reply, the Government stated in July 2021 that since there has been 71 *per cent* increase in Tiger population in the State, the territorial fights are normal behavior in Tiger ecology. 70 *per cent* of deaths of Tiger in the above seven Divisions was due to 75 *per cent* population of Tigers being in those Divisions. The State Government did not provide the studies on the causative factors or its plans to reduce the incidence of territorial fights.

Leopard mortality

A total of 209 Leopard deaths had been reported in the State between 2014 and 2018. Out of the 13 audited Divisions, 49 Leopards had died in nine Divisions, constituting over 23 *per cent* of the total cases in the State during 2014 to 2018. Details are shown in **Table 3.2** below:

Table 3.2: Reported cases of Leopard deaths during 2014 to 2018

Sl. No.	Division	Poaching/ Seizure ⁴⁷	Fight with Tiger/ Others	Road and Train Accidents	Others ⁴⁸	Total
1	Bandhavgarh Tiger Reserve	2	3	0	3	8
2	Kanha Tiger Reserve	2	2	1	3	8
3	Obedullaganj Division	0	0	4	4	8
4	Panna Tiger Reserve	0	1	0	3	4
5	Pench Tiger Reserve	1	4	0	3	8
6	Sanjay Tiger Reserve	0	0	1	3	4
7	Satpura Tiger Reserve	2	2	1	2	7
8	Two other Divisions ⁴⁹	1	0	0	1	2
	Total	8	12	7	22	49

(Source: Forest Department)

Our audit also pointed out deficiencies in reporting. For instance, two cases of the death of Leopards in April 2016 and April 2017 in Madhav National Park were not informed to the PCCF/ Wildlife. In case of the incident in April 2016, the post-mortem suggested death by hemorrhagic shock and on the recommendation of the doctor, biological samples were sent to Forensic Science Laboratory, Gwalior and Wildlife Forensic and Health Centre, Jabalpur for examination. However, the case was disposed off by the Director, Madhav National Park assigning the reasons as natural death in September 2016, even without receiving the Forensic Reports. The Director stated (December 2019) that the cases would be reported to the PCCF/ Wildlife and forensic reports would be obtained and decision would be taken accordingly.

Poaching was a major cause for fatalities, contributing 24 out of the total 129 Tiger and Leopard death (19 *per cent*) in the 13 audited Divisions during 2014 to 2018. Further details are shown in **Table 3.3**.

⁴⁷ Including 'Electrocutions'.

⁴⁸ 'Others' include death due to sickness, drowning, natural reasons and unknown causes.

⁴⁹ Madhav National Park and Van Vihar National Park

Table 3.3: Reported Poaching and Seizure cases of Tiger and Leopard

Poaching cases	Tiger	Leopard
	Poaching/ Seizure	Poaching/ Seizure
In the State	35	67
In selected units	16	8
Per Cent in Selected units	46	12

(Source: Forest Department)

The State Government accepted (September 2021) the observation.

3.2 Investigation and action on wildlife offences

Various offences, like poaching, illegal mining, illegal felling and removal of tree, encroachment, causing fire, etc. are defined in the Indian Forest Act, 1927 and Wildlife (Protection) Act, 1972. Forest Officers are vested with powers of registration and investigation of offence, as well as powers to compound⁵⁰ offences under these Acts.

3.2.1 Registration, Investigation and Disposal of Offence Cases

Year wise status of cases registered, investigated and compounded in audited Divisions are given in **Table 3.4**.

Table 3.4: Status of registered, investigated and compounded cases

Year	Opening Balance	Cases Registered	Total	Cases Investigated	Pending Investigations	Cases Compounded	Cases submitted to Courts
2014	6137	5286	11423	4274	7149	4506	281
2015	8128	4852	12980	5426	7554	6038	311
2016	7261	4932	12193	8426	3767	6516	624
2017	5266	5327	10593	5845	4748	2272	337
2018	4419	4050	8469	5070	3399	1919	323
Total		24447		29041		21251	1876

(Source: Forest Department)

We noted that an average of 4,889 cases of offences were registered in 12⁵¹ out of 13 audited Divisions annually during 2014 to 2018. In 12 out of 13 audited Divisions, the registered cases reduced by 23 *per cent* while cases investigated increased by 19 *per cent* during 2014 to 2018, with a high of 8,426 in 2016. As a result, pendency of cases came down significantly by 55 *per cent*— from a high of 7,554 in 2015 to a low of 3,399 in 2018. All these numbers showed welcome progress in investigation, and a possible reduction in offences committed as well. We further noted that in monitoring reports, the closing balance from the previous years were changed while showing opening balances in succeeding years in all Divisions without assigning any reasons.

Against 29,041 cases investigated in these Divisions, 21,251 (73 *per cent*) were compounded and another 1,876 cases were submitted to Courts. Thus, the remaining 5,914 cases, accounting for 1/5th of the cases, were awaiting action (compounding or initiating legal proceeding) after investigation at the Divisional level. Reasons for delays were not found on record. We also noted that the Department was hamstrung by lack of personnel at various levels (details at para 3.5.2.1) which too could hamper speedy action.

⁵⁰ Establish a compromise on the request of offender after levy of fine in lieu of offence.

⁵¹ No case registered in Van Vihar National Park.

The State Government agreed (September 2021) to the observation.

Box 3.3: Illegal trade of Pangolin and Turtle

There were a total of 16 cases of seizure of Pangolins and 21 cases of seizure of Turtles reported in the State during 2014 to 2018. Balaghat district was the prime hotspot of poaching, accounting for 50 per cent of cases involving Pangolins and 29 per cent of cases of seizure of Turtles. Given the fact that Balaghat district is one of the only two districts in the State to have over 50 per cent of its geographical area under forest cover, and also has a significant part of the Tropical Dry Deciduous Forest Type Group within its boundaries, it is of critical importance to ensure adequate action by the Forest Department to safeguard the flora and fauna in this district. However, the Department did not analyse the reasons for the high crime rate in Balaghat district. No research was caused on this issue either.

During 2014-18, 37 cases relating to Pangolin and Turtle trade were registered in 16 Divisions, of which 26 were pending in Courts and 10 were pending investigation with the Department while one has been disposed off. Six out of 36 which were pending since 2014-16.



Indian Pangolin

Indian Tent Turtle

(Photo: Sanjay Shukla)

(Photo: Abhinandan Shukla)

3.2.2 Forensic Investigations

Forensic investigation is important to identify the species of the sample collected from the scene of crime. Post-mortem is required to be conducted and sample of visceral content and tissue sent to a reputed laboratory for forensic analysis. For the specific requirements of deoxyribonucleic acid (DNA) profiling⁵² and histopathology⁵³ tests, the tissue samples are sent to the Wildlife Institute of India or any recognized institute.

There are five forensic laboratories in the State. We had earlier reported⁵⁴ delay in finalization of reports in Forensic Laboratories in Madhya Pradesh. Inadequate modernization of the

⁵² Test is required to identify the species for applying suitable provisions of forest laws. The result of the test decides whether the species is a wild animal or not and also whether it is listed under the Schedules of Wildlife (Protection) Act 1972.

⁵³ Histopathology test is to diagnose and study the diseases of tissues for detection of causes of death or illness.

⁵⁴ Paragraph 2.2.13.1 of the Audit Report on General and Social Sectors of the State of Madhya Pradesh for the year ended 31 March 2016.

laboratories and shortage of manpower were the primary reasons behind the delays. Delays appear to persist as in the case below, where the report was delayed by more than three years.

Box 3.4: Inadequate monitoring of forensic investigations

Samples on 243 cases were sent by 19 Divisions⁵⁵ (between 2000 and 2017) to the Centre for Cellular and Molecular Biology, Hyderabad for DNA analysis to identify the species. While 183 reports were collected, reports on the remaining 60 cases pertaining to the period between August 2007 and November 2015 were not received up to March 2017. These were finally received by the PCCF/ Wildlife in April 2017. But the reports remained with the PCCF/ Wildlife; they were sent to the respective Divisions in June 2019 at the instance of Audit.

The State Government agreed (September 2021) to the observation.

3.3 Mitigating safety measures

3.3.1 Retrofitting measures against linear infrastructure

Within many Protected Areas, roads, railway line and transmission lines cut across the landscape, fragment wildlife habitat and often result in mortality of animals, thus, endangering many of the species that have already been severely affected by development. We examined electricity, road and rail infrastructure projects in this context.

3.3.1.1 Electrocution

Out of 115 reported deaths of Tigers in the State during 2014-18, 16 were through electrocution, making it the second biggest cause of deaths after territorial fights. Similarly, out of 209 deaths of Leopards, 21 were killed during the same period by electrocution. This problem was supposed to be addressed by insulation of open electric lines or by installing Earth Leakage Circuit Breakers in sensitive forest areas.

We noted that the Divisions could not make significant achievements on these measures. A total of 1,089.6 kilometer of electric lines passed through Tiger Reserves/ Protected Areas in eight⁵⁶ of the audited Divisions. Besides the above, 28 electric lines also passed through the Nauradehi Division, for which the length was not on record. But only 3.6 kilometer of electric line (out of 1,089.6 kilometer) was insulated during 2013-19, that too only in Pench Tiger Reserve. Installation of Earth Leakage Circuit Breakers was also not done in these lines. As a result, electrocution remains a significant threat to wildlife in the Protected Areas in the State.

One of the reasons for poor implementation was lack of funds. We noted that Chief Wild Life Warden did not receive funds demanded (August 2013) amounting to ₹ 139.26 crore from the National Tiger Conservation Authority for insulation of 807.50 kilometer of electric line passing through 12 Forest Divisions. Alternate sources of funding this activity was not however explored.

⁵⁵ Balaghat (South), Bandhavgarh Tiger Reserve, Betul, Bhopal, Burhanpur, Chhindwara (East), Chhindwara (South), Damoh, Guna, Gwalior, Hoshangabad, Panna, Rewa, Sagar, Sehore, Sheopur, Sidhi, Seoni (South) and Seoni (North).

⁵⁶ Bandhavgarh Tiger Reserve, Kanha Core and Buffer Tiger Reserves, Panna Tiger Reserve, Pench Tiger Reserve, Sanjay Tiger Reserve, Satpura Tiger Reserve and Madhav National Park.

3.3.1.2 Road kills

A total of 339 animals reportedly died in road kills in nine⁵⁷ out of 13 audited Divisions during 2014-18. The Hon'ble Supreme Court in its order⁵⁸ on 1 March 2013, instructed States to install certain measures, such as speed breakers, to limit speed to 20 kilometer/ hour and ban night traffic in Protected Areas. The Wildlife Institute of India's Guidelines (October 2016) prescribed construction of underpasses according to the width of the road.

Box 3.5: Mitigation measure adopted in Kanha Tiger Reserve

We noted that in State Highway-26 passing through Kanha Tiger Reserve, measures such as speed limit, speed breakers and night traffic ban have been implemented. The time of entry and exit are noted at the barrier and the time difference thereon, provided the data for monitoring speed control.

In none of the other Tiger Reserves/ Protected Areas, the night traffic was banned or speed limit imposed. Inadequacies noticed in retrofitting measures in the road passing through Tiger Reserves/ Protected Areas are detailed in **Appendix 3.1**.

Box 3.6: Road mitigation measures adopted in National Highway-7

Wildlife clearance of the project in April 2018 included 4.493 hectare land of Pench Mowgli Wildlife Sanctuary and 3.744 kilometer road. The sanction included conditions such as construction of 14 underpasses etc. However, there was no provision of night traffic and speed limit or for sound barriers. Snake-specific mitigation measures were also not provisioned despite threat to snakes highlighted in a research report⁵⁹.

The State Government agreed (September 2021) to the observation.

3.3.1.3 Railway lines

Railway lines pass through two of the audited Divisions, i.e. Sanjay Tiger Reserve and Obedullaganj Division. Out of the total 48 registered wildlife death cases in these Divisions, a total of 28 cases (58 *per cent*) occurred due to train accidents. The PCCF/ Wildlife had instructed all Field Directors and Regional Chief Conservators of Forest in May 2017 to map and geo-tag the locations in which wild animals had died in train accidents and to identify the length in which any type of barricade, underpasses/ overpasses were to be constructed. However, we were not provided with records to show that this activity was undertaken. We examined the mitigation measures in respect of two railway lines, results of which are detailed in **Table 3.5**.

⁵⁷ Bandhavgarh Tiger Reserve, Kanha Core, Kanha Buffer, Madhav National Park, Nauradehi Division, Obedullaganj Division, Panna Tiger Reserve, Pench Tiger Reserve and Satpura Tiger Reserve.

⁵⁸ IA No. 2062-63 in WP(C) No 202/ 1995

⁵⁹ 'Spatial pattern and factors influencing the mortality of snakes on the National Highway-7 along Pench Tiger Reserve', A. Pragatheesh and Asha Rajvanshi, Wildlife Institute of India, 2013.

Table 3.5: Deficiencies in implementing mitigation measures on Railway lines

Sl. No.	Name of Protected Area/ Tiger Reserve	Length of Rail line (in Kilometre)	Reported mortality (2014 to 2018)	Deficiency
1	Ratapani Wildlife Sanctuary	41.420	Four Leopards and four Wild Boar. Further three Tigers also died in Railway line near to the Ratapani Wildlife Sanctuary.	Speed restriction of 40 kilometer per hour imposed by National Board for Wild Life. However, Forest Department revoked the speed restriction on the request of Additional General Manager, West Central Railway.
2	Sanjay Tiger Reserve	27.500	20 wild animals, such as Chital, Chinkara, Wild Boar, Hyena and Bear.	<ul style="list-style-type: none"> • Site for underpasses had not been identified, sites selected for chain-link fencing was also not intimated to the Chief Engineer (Works), West Central Railway. • The Committee for monitoring of safety measures was not constituted by the PCCF/ Wildlife.

(Source: Forest Department)

The State Government agreed (September 2021) to the observation.

3.4 Administrative measures for tiger conservation

3.4.1 Establishment of Special Tiger Protection Force

Three⁶⁰ Tiger Reserves of Madhya Pradesh were selected by the National Tiger Conservation Authority for raising, arming and deploying the Special Tiger Protection Forces. A tripartite agreement was signed between the National Tiger Conservation Authority, the State Government and Field Directors of these three Tiger Reserves in 2009-10. Besides the quick response, the Force was also expected to have a deterrent impact on poaching.

However, the Special Tiger Protection Force was not established in any of the three designated Tiger Reserves. The PCCF/ Wildlife stated (June 2019) that the request for sanction of new posts and provision for budget for the Special Tiger Protection Force staff is pending with the State Government. We noted that the PCCF/ Wildlife had sent the proposal to the State Government for creation of Special Tiger Protection Force only in February 2018, i.e. after eight years of signing the Memorandum of Understanding with the National Tiger Conservation Authority. Only issue was funding.

Box 3.7: Issues of territorial jurisdiction

Out of the 115 Tiger death cases during 2014 to 2018, 79 cases were reported in Protected Areas, 29 in Territorial Divisions and seven in the area under management of Madhya Pradesh State Forest Development Corporation. In January 2018, PCCF/ Wildlife suggested to Managing Director, Madhya Pradesh State Forest Development Corporation to transfer wildlife dominated areas from Madhya Pradesh State Forest Development Corporation to Territorial Forest Divisions. Actions taken by the Managing Director on the suggestion of PCCF/ Wildlife in this matter were not available on records. Further, four Tigers died (three cases of Poaching/ seizure and one death case) in the areas under Madhya Pradesh State Forest

⁶⁰ Bandhavgarh, Kanha and Pench.

Development Corporation (Barghat Project, Mohgaon Project, Lamta Project and Kundam Project) in 2018 only.

The State Government agreed (September 2021) to the observation.

3.4.2 State Level Tiger Strike Force

There is a State Level Tiger Strike Force, as well as five Regional Tiger Strike Forces, in operation in the State.

During 2014-18, the State Level Tiger Strike Force registered 27 cases of wildlife offences, of which a total of 23 cases filed by the State Level Tiger Strike Force were pending in Courts (as on October 2019). Two cases from 2015 and 2018 were being investigated by the Department while in respect of two remaining cases, the penalties have been awarded.

The pendency of Court cases called for administrative action. But the Legal Cell was not established since inception of State Level Tiger Strike Force and the posts of Prosecution Officers requested in 2017-18 by the PCCF/ Wildlife were also not sanctioned as of September 2020.

The PCCF/ Wildlife stated in July 2020 that Government of India has been requested to declare the PCCF/ Wildlife as a law enforcement agency and a proposal had also been sent to the State Government for establishment of a separate Legal Cell, both of which were pending.

3.5 Resourcing conservation

3.5.1 Equipment

Wireless sets

In deep forest areas, mobile phone networks are often not available, especially in inviolate Protected Areas, and thus, availability of wireless network becomes important. Wireless sets are also the means of broadcast as one message could be sent simultaneously to all concerned.

Five⁶¹ out of the 13 audited Divisions had not assessed the requirement of wireless sets. These Divisions had 698 active wireless sets; another 182 sets were unusable.

In the other eight⁶² Divisions, requirement was assessed at 2,012 wireless sets. However, only 1,249 usable wireless sets were available and another 793 sets were beyond repair. These unserviceable wireless sets were not replaced.

Arms

The 2nd National Wildlife Action Plan (2002-2016) recommended that the Forest Department officials must have a status at par with the State Police in the carriage and use of weapons in self-defence and in protecting wildlife and their habitat. The State Government therefore provided Arms to the Forest Department, but only for purpose of the self-defence. Deficiencies noticed in the 13 sampled Divisions are as following:

⁶¹ Dewas Division, Kanha Buffer Tiger Reserve, Obedulaganj Division, Sanjay Tiger Reserve and Van Vihar National Park.

⁶² Bandhavgarh Tiger Reserve, Kanha Tiger Reserve (Core), Kuno National Park, Nauradehi Division, Panna Tiger Reserve, Pench Tiger Reserve, Satpura Tiger Reserve and Madhav National Park.

- In eight⁶³ Divisions, assessment of Arms was not made but a total of 334 Arms were available;
- In Kanha Tiger Reserve, the requirement of 65 Arms was arrived at by calculating five Arms per Range for 13 Ranges. Available Arms in the Division was 76;
- Three Divisions⁶⁴ assessed the requirement of Arms as 67. However, these Divisions had 107 Arms, which were more than the assessment.

Further, we noted that the Obedullaganj Division had more availability of Arms (83) than all the Tiger Reserves. Thus, it could not be confirmed whether the supplies of guns to the Divisions was based on rational assessment of need.

In the 13 audited Divisions, available Arms were kept at the Division Office or Range Office or Forest Posts or at Strong Rooms of the Police Department. It was not clear how the prompt supply of Arms could be ensured during the times of immediate requirements in the field. Further, as mentioned in Paragraph 3.5.3, Arms were available only in seven *per cent* inspected Patrolling Camps, that too in Sanjay Tiger Reserve, Kuno National Park and Obedullaganj Divisions only. This indicated that the distribution of arms need a relook.

Metal detectors

As per the Guidelines of National Tiger Conservation Authority, use of Deep Search Metal Detectors are to be encouraged in protected areas to detect metal leg traps and snares. During 2014-18, four Tigers were poached in the three audited Divisions⁶⁵ through use of snares.

34 Metal Detectors were available in five Tiger Reserves⁶⁶ while these were not available in Sanjay Tiger Reserve. In Pench Tiger Reserve, the Metal Detectors were used in cases of wildlife deaths for searching bullets and other metal. Only Panna Tiger Reserve used six available Metal Detectors for detection of traps and snares in peripheral areas.

3.5.2 Manpower

3.5.2.1 Availability

Adequacy of manpower is vital for wildlife conservation and protection. However, we noted more than 20 *per cent* shortage in manpower in eight out of the 13 audited Divisions. The maximum shortage was 52 *per cent* in the post of Deputy Ranger while it was 16 *per cent* in the post of Forest Guards. Shortage of 41 *per cent* in the post of Range Officer was also noticed, which is the top supervisory post at Range level. Further details are at **Appendix 3.2**.

Further, the Department had not fixed criterion of area for watch and ward of a Beat by Forest Guards⁶⁷. On an average, one Forest Guard was sanctioned for 9.09 square kilometer. We noted that there was no standard norm for working out the sanctioned posts and the allotted area for

⁶³ Bandhavgarh Tiger Reserve, Kanha (Buffer) Tiger Reserve, Kheoni Wildlife Sanctuary, Madhav National Park, Panna Tiger Reserve, Pench Tiger Reserve, Nauradehi Division and Obedullaganj Division.

⁶⁴ Kuno National Park, Sanjay Tiger Reserve and Satpura Tiger Reserve.

⁶⁵ Bandhavgarh Tiger Reserve, Kanha Tiger Reserve and Panna Tiger Reserve.

⁶⁶ Bandhavgarh (five), Kanha Core (two), Kanha Buffer (six), Panna (six), Pench (seven) and Satpura (eight).

⁶⁷ Also known as Beat Guard.

patrolling ranged from 0.10 square kilometer in Van Vihar National Park to 18.14 square kilometer in Sanjay Tiger Reserve. Division-wise details are given in **Appendix 3.3**. Due to shortage of Forest Guards against sanctioned posts, average area of watch and ward under them had increased by 17 *per cent* in the 13 audited Divisions. The range varied from 0.11 square kilometer in Van Vihar National Park to 19.48 square kilometer in Sanjay Tiger Reserve. On an average, a guard was posted for 10.68 square kilometers. The Kuno National Park even had more working Forest Guards per square kilometer than the Tiger Reserves except Kanha Tiger Reserve (Core), Pench Tiger Reserve and Bandhavgarh Tiger Reserve. This indicated that sanctioned as well as working strength in these Tiger Reserves were not rational.

In reply, the Government stated (July 2021) that promotion of staff was under consideration of Hon'ble Supreme Court. As all posts of Deputy Ranger and one third of Range Officers are filled by promotions, there are vacancies in these posts. The Van Vihar National Park is a Zoo as well as a Rescue Centre, hence manpower posting seem high there. The Kuno National Park has been traditionally affected with dacoit problems and poaching, and Lions were also to be introduced in this Protected Area. Hence, high staff density was necessary there. However, the reply was silent about filling up of posts which are vacant under direct recruitment quota such as Range Officers and Forest Guards. It was also silent about variation in number of Forest Guards per square kilometer between various Divisions.

3.5.2.2 Training

An essential component in ensuring optimum conservation efforts is the availability of trained manpower. The 2nd National Wildlife Action Plan (2002-2016) proposed the establishment of a Wildlife Training Center for frontline staff in each State.

Training of Forest Service Officers

With a view to developing a pool of professionals with requisite ability to manage Protected Areas, a post graduate diploma course in advanced wildlife management is periodically organised by the Wildlife Institute of India, Dehradun. The course is meant for in-service Indian Forest Service and State Forest Service officers of the rank of Deputy Conservator of Forests/ Assistant Conservator of Forests and equivalent. Similarly, the Wildlife Institute of India, Dehradun also runs a Certificate Course for in-service Range Officer/ Deputy Ranger.

We noticed that out of 55 Indian Forest Service/ State Forest Service Officers posted in the 13 audited Divisions, only 10 had completed the course from the Wildlife Institute of India. The Divisions informed us that only the Field Directors of Pench and Sanjay Tiger Reserves were trained in the Wildlife Institute of India, Dehradun. Only seven out of 90 Range Officers in four Divisions had the Wildlife Institute of India Certificates.

Training to frontline staff

As per the 2nd National Wildlife Action Plan (2002-2016), each State should establish a Wildlife Training Centre for frontline staff. Bio-diversity Training Centre, Tala, Umariya came into existence in 1980 which runs 15 modules relating to protection, as well as Wildlife and Bio-diversity conservation.

We noted that the Game Guard training and orientation courses for Forest Guards in the Training Centre were stopped since 2003 due to the constraint of time and personnel (trainer) in imparting training to Game Guards (Forest Guards) who form the frontline staff in wildlife conservation.

The Field Directors/ Directors of audited Divisions stated that workshops and seminars on various topics, such as forensics and collection of samples, human wildlife conflict, etc. have been organised. However, the assertion was not supported by adequate documents.

The State Government agreed (September 2021) to the observation.

3.5.3 Patrolling Camps

Strategically located forest camps and intensive patrolling by the ever-vigilant staff help in increasing wildlife population by keeping intrusion and encroachment under control.

In 12⁶⁸ out of 13 audited Divisions, a total of 915 Patrolling Camps were operational; in Sanjay Tiger Reserve, 39 Patrolling Camps were inoperative due to paucity of manpower. We conducted Joint Inspections of 121 Patrolling Camps, out of which 103 were in Tiger Reserves and rest 18 were in National Parks and Wildlife Sanctuaries. Our findings are given below:

- Out of 103 Patrolling Camps in Tiger Reserves, 99 maintained registers and field forms required to record daily activities of patrolling and various events. Four⁶⁹ Patrolling Camps did not maintain the records;
- Two⁷⁰ out of four inspected Patrolling Camps of Madhav National Park were inactive at nights because the Camps did not have basic amenities, such as bed, light and water. We noted that there was more than 90 *per cent* savings in two activities, construction of hand pumps for Patrolling Camps, and repair and maintenance of Patrolling Camps for safe residing. Karera Patrolling Camp was constructed in the Forest Colony instead of Wildlife Sanctuary and staff was not deployed in the Camp;
- Four⁷¹ out of 20 inspected Patrolling Camps in Pench Tiger Reserve were huts which did not provide adequate security to the camp staff from rain and heat. We noted that demand was made for construction of 12 other Patrolling Camps during the period of audit, but these four Patrolling Camps were not included in this demand. The Dewalpani Patrolling Camp in Nauradehi Division was built in 2017-18. During joint inspection (October 2019) we noticed that there were no windows and doors in the building and tiles were not laid. Although the payments had been effected for these items of work indicating possible misappropriation.

⁶⁸ Except Van Vihar National Park.

⁶⁹ Bicchi in Sanjay Tiger Reserve; and Palha, Gabdighat and Jodatalab in Bandhavgarh Tiger Reserve.

⁷⁰ Futibawadi and Gateway Patrolling Camps.

⁷¹ Chhindewani, Moyakatta, Mahuadan and Nalyer.



Newly constructed Ghatpendri Patrolling Camp, Pench Tiger Reserve , Seoni (August 2019)



Chhindewani Patrolling Camp run in small earthen structure, Pench Tiger Reserve (August 2019)



Dewalpani Camp in Nauradehi Wildlife Sanctuary (October 2019)



Kartoli Patrolling Camp in Obedullaganj Division (December 2019)

(Photographs taken by Audit Party during joint inspections of Patrolling Camps with Forest Department officials between August 2019 and December 2019)

- Frontline staff are to be provided kerosene, medicine, field kit, mosquito net, torch etc. We conducted a survey of Beat Guards who are in charge of Patrolling Camps, through a pre-set questionnaire, the results of which are at **Appendix 3.4**. Seven *per cent* Camps had Arms, 81 *per cent* Camps had tiger tracer. Thus, Arms were available in few Patrolling Camps, compromising the ability of the personnel to act in self-defense. Toilet facility was available in 68 *per cent* Patrolling Camps only. We noted that Medicine Kit was available in the Camps in Tiger Reserves only. In other Protected Areas, fund was not made available for the same. Further, there was a demand of ₹ 25,000 in Kuno National Park in 2014-15 for Medicine Kits, but the fund was not provided.
- One or two daily wage labourers are engaged in Camps with Beat Guards. They stay in the Camps and also patrol. They are paid monthly and are provided with ration allowance, water bottles and mosquito nets and health checkups are conducted periodically. They also have provisions for weekly off and prizes for good work done. We sought responses from 119 labourers posted in the Patrolling Camps of 12⁷² out of 13 audited Divisions with regard to their satisfaction level. 31 *per cent* labourers spoke of delays in payment of wages, particularly in Kanha Buffer, Bandhavgarh and Panna Tiger Reserves. Health checkup facility was available to 69 *per cent* labourers overall

⁷² Except Van Vihar National Park.

but was not available to the labourers of two National Parks⁷³ and three⁷⁴ Wildlife Sanctuary Divisions. In four National Park/ Wildlife Sanctuary Divisions⁷⁵, water bottles were not provided and in Obedullaganj Division and Kheoni Wildlife Sanctuary, mosquito nets were not provided. In Kanha Tiger Reserve, there was savings of 89 *per cent* against sanction of ₹ 3.66 lakh for medical camp. In Pench Tiger Reserve, ₹ 0.50 lakh sanctioned for water bottles was not utilized.

- All Tiger Reserves provided⁷⁶ ration allowances to Camp labourers except Sanjay and Satpura Tiger Reserves. Weekly off was also given to 81 *per cent* labourers in 12 audited Divisions. The summary of the responses is shown in **Appendix 3.5**.

The State Government agreed to the observation (September 2021). Regarding delays in payment of wages to labourers, the Principal Secretary stated during the Exit Conference, that this issue would be examined to bring in improvement in the situation.

3.6 Other Issues on Conservation

3.6.1 Human-Wildlife Conflict

Wild animals are adversely affected by human activities by way of loss of habitat due to conversion of forest land for non-forestry purposes. On the other hand, people residing close to wild animals habitats also suffer from economic loss due to crop raiding by wild animals, cattle depredation, attacks of carnivores on human beings and transmission of diseases from wild animals⁷⁷. As a result, Human-Wildlife conflict occurs and slowly increases over time.

Tiger Conservation Plans of three Tiger Reserves — Pench, Kanha and Satpura — broadly identify the reasons for Human-Wildlife Conflict. Of these two⁷⁸ also identify the actions⁷⁹ prescribed in case of an event of conflict. The Bandhavgarh, Panna and Sanjay Tiger Reserves did not have any approved Tiger Conservation Plans (also referred in Paragraph 2.2.1).

⁷³ Kuno National Park and Madhav National Park Division.

⁷⁴ Dewas (General) Division, Nauradehi Division and Obedullaganj Division.

⁷⁵ Dewas (General) Division (Kheoni Wildlife Sanctuary), Madhav National Park, Nauradehi Wildlife Sanctuary and Obedullaganj Division.

⁷⁶ Clause (c) of sub-Section (1) of section 38-O of the Wildlife (Protection) Act, 1972 as amendmend by the Gazette of India (July 2014) ration allowance to be provided to Beat Guards as well as Camp labourers.

⁷⁷ Paragraph 5.5 of Tiger Conservation Plan (Core), Pench Tiger Reserve.

⁷⁸ Kanha and Satpura Tiger Reserves.

⁷⁹ The Management consoles the family, makes the prescribed ex-gratia payment at the earliest and mollifies the anti-park anger/ protests of the villagers at the same time. The Management also attempts to spread awareness about the inviolability of the boundaries through public announcements and distribution of pamphlets in the villages, so that such instances of the human-wildlife conflicts may be kept at a minimum.

Details of the compensation for cattle depredation/ injury and death/ injury of human beings due to attacks by carnivores are shown in **Appendix 3.6**. The Managements of 11 Divisions⁸⁰



A Photograph depicting cattle predation

(Source: Bandhavgarh Tiger Reserve)

paid compensation of ₹ 15.44 crore for 17,466 cases of cattle injury/ predation and ₹ 1.66 crore for 1,156 cases of injury and death of human beings due to carnivore attacks in five years during 2014-19. There was no case of Human-Wildlife Conflict in Madhav and Van Vihar National Parks. The total reported cases of Human-Wildlife conflicts had increased by 73 per cent during 2014-19.

Areas specifically prone to Human-Wildlife Conflict were not identified by the Managements of sampled Divisions, except Kanha Tiger Reserve, for prescribing and implementing site specific measures to minimise the conflicts. The Field Director, Kanha Tiger Reserve stated that four ranges of the Tiger Reserve had been identified as hot spots for Human-Wildlife Conflict cases.

In reply, the Government stated (July 2021) that due to increase in population of wildlife and habitats in corridors, instances of death and injury to cattle had increased. Further, operations of regional rescue squads and awareness programmes in areas near the Protected Areas, have strengthened control over Human-Wildlife Conflict. However, the data shows continued increase of Human-Wildlife Conflicts over the year.

Crop raiding

Herbivores raid farms close to forests and destroy crops, developing animosity about wildlife among the residents. Cases of crop raiding are dealt with by Revenue Department as per the State Government notification of January 2014.

We found that the Divisions did not maintain data on crop raiding despite the fact that such events necessitate payment of compensation by the Revenue Department on the basis of joint inspection with field staff of Forest Department.

3.6.2 Genetic swamping in wild species

As per the 2nd National Wildlife Action Plan (2002-2016), alteration of genetic purity of certain wild species through inbreeding with domesticated or feral counterparts is yet another grave impending threat, seriously jeopardising the genetic purity of species like the Wild Buffalo, Wild Pig and Jungle Fowl. The 2nd National Wildlife Action Plan sought to take immediate steps for preventing the entry of domestic and feral species that may lead to genetic swamping⁸¹.

Entry of domestic and feral species into wildlife habitats are to be controlled by construction of cattle-proof walls and trenches and patrolling in peripheral areas. However, available Tiger

⁸⁰ Bandhavgarh Tiger Reserve, Dewas Division (Kheoni Wildlife Sanctuary), Kanha Tiger Reserve (Core), Kanha Tiger Reserve (Buffer), Kuno National Park, Panna Tiger Reserve, Nauradehi Wildlife Sanctuary, Pench Tiger Reserve, Obedullaganj Division, Sanjay Tiger Reserve and Satpura Tiger Reserve.

⁸¹ Local genotypes replaced by hybrids.

Conservation Plans/ Management Plans of sampled Divisions did not address the issue of genetic swamping. We noted that National Tiger Conservation Authority's Report on Status of Tigers, Co-predators and Prey in India, 2018 highlighted high sightings of domestic dogs and livestock in all six Tiger Reserves of the State. The Managements of the Tiger Reserves/ Protected Areas concerned had also not identified species vulnerable to genetic swamping.

The State Government agreed (September 2021) to the observation.

3.6.3 Translocation of Wildlife

Translocation is the capture, transport and release of a species from one location to another. As per Section 12 (bb) of the Wildlife (Protection) Act, 1972, the Chief Wild Life Warden may grant permit for translocation of any wild animal to an alternative suitable habitat. Further, the National Tiger Conservation Authority's Standard Operating Procedure⁸² specifies that adequacy of field protection and prey base should be ascertained at new site prior to translocation. Thus, suitability of new site was the prime consideration before granting permit for translocation. Our findings on translocation of wildlife in the State in sampled divisions are as below:

- In Sanjay Tiger Reserve, permission for translocation of three species, i.e. Tiger, Leopard and Chital to the Tiger Reserve was granted by the Chief Wild Life Warden during 2014-19. Six Tigers from Panna, Pench, Bandhavgarh and Kanha Tiger Reserves, 324 Chitals from Bandhavgarh Tiger Reserve and two Leopards from Satna (General) Division and Kanha Tiger Reserve were translocated into Sanjay Tiger Reserve. As per current status provided by the Field Director, two Tigers died due to infighting and sickness while Chital and Leopard were ranging in the Tiger Reserve;
- The Simlipal and Satkosia Tiger Reserves in Odisha represent a lineage that produces Melanistic⁸³ Tigers and is likely to be of a unique gene pool in this landscape. There is a need to maintain the genetic integrity of this landscape by refraining from relocating tigers from other areas of Central India into this cluster⁸⁴.

National Tiger Conservation Authority approved (December 2016) reintroduction of Tigers in Satkosia Tiger Reserve under condition of assuring protection and prey base at the new site. Six Tigers were to be relocated in the process. One male and one female Tiger were translocated in June 2018 from Kanha Tiger Reserve and Bandhavgarh Tiger Reserve respectively. The male Tiger reportedly died of injuries caused by snare on November 2018. Translocation process of another four Tigers was not undertaken. Further, the Tigress was brought back and kept in an enclosure in Kanha Tiger Reserve (March 2021).

⁸² Standard Operating Procedure for Active Management Towards Rehabilitation of Tigers from Source Areas at the Landscape Level, National Tiger Conservation Authority, New Delhi.

⁸³ A rare gene pool on which the black stripes of the Tigers are more prominent.

⁸⁴ Standard Operating Procedure for Active Management Towards Rehabilitation of Tigers from Source Areas at the Landscape Level, issued by National Tiger Conservation Authority.

Thus, translocation of two Tigers to Satkosia Tiger Reserve was against the provisions of the Standard Operating Procedure of the National Tiger Conservation Authority and also protection measures at new site was not assured.

In reply, the Government stated (July 2021) that translocation of two tigers to Satkosia was done as per the Standard Operating Procedure of National Tiger Conservation Authority and protection and conservation of tigers were the responsibility of Odisha State. However, the Standard Operating Procedure suggested not to relocate tigers to Satkosia Tiger Reserve from other areas of Central India. Further, the PCCF/ Wildlife did not assure protection measures at Satkosia Tiger Reserve as required under the Wildlife (Protection) Act, 1972 and provisions of the Standard Operating Procedure of the National Tiger Conservation Authority.

- Between January 2015 and January 2017, 33 Barasinghas were translocated from Kanha Tiger Reserve to Satpura Tiger Reserve and kept in an enclosure with a view to provide the animal an alternative home. After their population increased, 72 Barasinghas were reported in the Tiger Reserve as on January 2019, out of which 51 had been released in wild (January 2019). However, regular monitoring of the released Barasinghas was not done after March 2020. We further noted that prior to the translocation, availability of sufficient swamps in the Tiger Reserve required for their food was not analysed.

The Field Director, Satpura Tiger Reserve stated (September 2020) that in future, regular monitoring of the released animals would be incorporated in the protocol prepared for translocation. However, the reply was silent about the immediate measures to be taken by the Field Director on monitoring of the Barasinghas released in the wild. Without adequate monitoring of the Barasinghas released in the wild, success or failure of the translocation process can not be assessed. Further, the Department did not inform whether a new protocol has been prepared or not.

We also noted the successes in translocation in State detailed in Box 3.8 below:

Box 3.8: Successful translocations

- A five-month old female Tiger cub was rescued after her mother died in Bandhavgarh Tiger Reserve in August 2014. Later, she was translocated to Sanjay Tiger Reserve in March 2016. In October 2016, she was released in the wild. She delivered her first litter of three cubs in June 2017 and the second litter of four cubs in March 2019. All three cubs of the first litter have grown up as adults and have established their own territory in the forests of Sanjay Tiger Reserve.

Thus, an orphan cub was translocated, looked after and raised as captive animal inside an enclosure, released in the wild as an adult and had extended the population of the endangered species, setting up a good example of conservation through translocation.



Chital and Tiger enclosures in Dubri Range

Tigress with a cub in her Den

(Photo: Audit Party during field visit)

(Photo: Range Officer, Dubri Wildlife Sanctuary)

- Similarly, one Tiger and one Tigress were introduced in April 2018 in the Nauradehi Wildlife Sanctuary under the approval (March 2018) of the Chief Wild Life Warden, Madhya Pradesh. These Tigers were earlier kept in Ghorela enclosure in Kanha Tiger Reserve and translocated to the Nauradehi Wildlife Sanctuary. This Tigress has also delivered three cubs in May 2019 in the Wildlife Sanctuary.
- The entire population of Tigers was eliminated from Panna Tiger Reserve by 2009 (Box 3.1). The task of reintroduction of Tigers was undertaken in November 2009 and as per 2018 Tiger Census, the Tiger Reserve was filled with 25 adult Tigers.

3.6.4 Eco-tourism

Eco-tourism is ‘responsible travel to natural areas that conserves the environment and improves the well-being of the local people’. It allows a scope to link a Protected Area to a wider constituency and build support for conservation, while raising awareness in the public at large⁸⁵ about the worth and fragility of ecosystems.

3.6.4.1 Regulation of tourist vehicle in Tiger Reserves

For Tiger conservation, non-consumptive⁸⁶, regulated, low impact tourism could be permitted within core or critical Tiger habitat. The Wildlife (Protection) Act, 1972, specifically provides for laying down normative standards for tourism activities in Tiger Reserves for due compliance.

Accordingly, the vehicle carrying capacity of the Tiger Reserves was approved (September 2015) by the National Tiger Conservation Authority, which continued to be applicable up to 2017-18. In May 2018, PCCF/ Wildlife increased the carrying capacity as shown in **Table 3.6**.

⁸⁵ Para 11.2 of Tiger Conservation Plan, Pench Tiger Reserve.

⁸⁶ Use of forest resources from any forest area that is returned to the forest area from which it was withdrawn, at or near the point from which it was withdrawn, without substantial diminution in quantity or quality.

Table 3.6: Carrying Capacity of Tiger Reserves as approved in September 2015 and Committee suggested in October 2018

S N	Tiger Reserve	Carrying Capacity		
		September 2015	October 2018	Per cent increase
1	Kanha Tiger Reserve	140	178	27
2	Pench Tiger Reserve	88	99	13
3	Bandhavgarh Tiger Reserve	111	147	32
4	Panna Tiger Reserve	70	85	21
5	Satpura Tiger Reserve	24	140	483
6	Sanjay Tiger Reserve	--	80	--

(Source: PCCF/ Wildlife)

We noted that the National Tiger Conservation Authority rejected (October 2018) the revised carrying capacity and directed that the vehicles may be allowed to enter as per the carrying capacity fixed earlier. However, the Department continued to allow entry of vehicles as per the increased capacity since October 2018. The PCCF/ Wildlife cited problem in roll back of booked tickets in online system.

During 2014-19, the tourists footfall in the six Tiger Reserves in a tourism year⁸⁷ increased from 6.65 lakh to 9.80 lakh (47 per cent). A study⁸⁸ conducted in Kanha and Bandhavgarh Tiger Reserves showed that wildlife tourism cause distinct physiological stress in Tigers in Protected Areas. It also established a positive co-relation between anthropogenic disturbance and physiological stress levels as assessed in Faecal Glucocorticoid⁸⁹ Metabolite (fGCM)⁹⁰ concentrations of individual Tigers. The Study Report recommended strict regulation of vehicular traffic and number of tourist vehicles, shifting of artificial waterholes away from tourist roads and reducing other anthropogenic disturbance, including relocation of villages from the Core area of a Tiger Reserve.

PCCF/ Wildlife did not take cognizance of this study report to reverse the decision to increase the carrying capacity and instead cited problems in roll-back of booked tickets in online system.

The State Government agreed (September 2021) to the observation.

3.6.5 Disease Control

As per the Wildlife (Protection) Act, 1972, the Chief Wild Life Warden is to take prescribed measures for immunisation against communicable diseases of the live-stock kept in or within five kilometer of a Wildlife Sanctuary and National Park⁹¹. Disease control is also essential for timely action to prevent disease outbreaks and control large-scale mortality⁹².

⁸⁷ Between July to June.

⁸⁸ Abhinav Tyagi and others, 2019, Physiological stress responses of Tigers due to anthropogenic disturbance especially tourism in two central Indian Tiger reserves, Laboratory for the Conservation of Endangered species, Council for Scientific and Industrial Research—Centre for Cellular and Molecular Biology, Hyderabad, co-funded by Department of Science and Technology, Government of India.

⁸⁹ Glucocorticoids are essential steroid hormones secreted from the adrenal gland in response to stress.

⁹⁰ Analysis provides a non-invasive method for studying the physiological response of wildlife to a variety of stressors and is a ground-breaking monitoring technique in wildlife management and conservation.

⁹¹ Section 33A read with 35(8) of Wildlife (Protection) Act, 1972.

⁹² Para 12.2 of the Tiger Conservation Plan (Core) of Pench Tiger Reserve.

3.6.5.1 Disease surveillance

For maintenance of health of wild animals, it is essential to monitor and survey the parasitic and infectious diseases periodically for timely action to prevent the spread of disease.

In three⁹³ out of audited 13 Divisions, there was no sanctioned post of Veterinary Doctor whereas in Kuno National Park, though sanctioned, the post was lying vacant since February 2016. We noted that no action was on record for filling up the vacancy. There was no sanctioned post of veterinary assistant except in Kanha Tiger Reserve. Training to frontline field staff (Forest Guard, Forester and Range Officer) in basic health monitoring of diseased/injured wild animals was also inadequate. Even the training calendar was not prepared. Veterinary dispensary or hospital with well-equipped laboratory was not established in any of the Tiger Reserves/ Protected Areas. These issues had also been highlighted in CAG's Audit Report 2013-14⁹⁴. However, these were still not available in the audited Divisions.

Domestic cattle, which may transmit the disease among wild fauna, are required to be vaccinated to prevent the occurrence of foot-and-mouth disease, black quarter and hemorrhagic septicemia. We noted that the Forest Department has not established an effective co-ordination mechanism with Animal Husbandry and Dairy Department, Madhya Pradesh to obtain the data of total cattle to be vaccinated in villages in and around the Protected Areas during the period of audit. This data was not even available with the audited Divisions, except in Bandhavgarh and Kanha Tiger Reserves.

Prophylactic immunisation of cattle in villages in and around the Tiger Reserves was done in six⁹⁵ Tiger Reserves as well as Madhav and Kuno National Parks, with the help of the Animal Husbandry and Dairy Department and Non-Government Organisations. However, we could not draw assurance on vaccination of all the cattle in the absence of data of total available cattle. Cattle immunisation was not done in five⁹⁶ Protected Areas. In Kanha Tiger Reserve also, vaccination of only around 40 *per cent* of available cattle was done, whereas in Bandhavgarh Tiger Reserve, vaccination was done only in five villages in 2015-16 against 162 villages identified.

Thus, disease surveillance was affected by inadequate co-ordination with Animal Husbandry and Dairy Department as well as health infrastructure especially lack of veterinary staff.

The State Government agreed (September 2021) to the observation.

3.6.5.2 Action against the threat of Canine Distemper Virus

Dogs are a threat to both ungulates (which they hunt) and to carnivores, since they carry infectious diseases, like rabies, parvovirus, and distemper⁹⁷. The National Tiger Conservation Authority directed in June 2013 that vaccination of stray cattle, cats and dogs living around Tiger Reserves should be done on regular basis. It further directed in January 2014 that during

⁹³ Obedullaganj, Nauradehi and Dewas.

⁹⁴ Para reference 2.1.9.2 of Performance Audit on "Working of Tiger Reserves, National Parks and Sanctuaries" of Report No. 1 of 2015.

⁹⁵ Bandhavgarh, Kanha, Panna, Pench, Sanjay and Satpura.

⁹⁶ Kheoni Wildlife Sanctuary, Nauradehi Wildlife Sanctuary, Ratapani Wildlife Sanctuary, Singhori Wildlife Sanctuary and Van Vihar National Park.

⁹⁷ National Tiger Conservation Authority, 2018, Report on status of Tigers, Co-predators and Prey in India.

post mortem, blood/ tissue samples from carnivores should be sent to designated institutes for testing for Canine Distemper Virus.

We noted that except in Panna Tiger Reserve, dogs and cats were not immunised against Canine Distemper Virus. Sample of tissues of tigers which died due to unknown diseases were not sent to the designated institutes for Canine Distemper Virus diagnosis, except in Panna Tiger Reserve where as per the test reports, one tiger and two leopards had died due to Canine Distemper Virus during 2014-18.

The PCCF/ Wildlife stated (August 2019) that as no case of Canine Distemper Virus was detected, action relating to Canine Distemper Virus was not done. However, the reply was incorrect as three Canine Distemper Virus cases had been detected (August 2015, November 2015 and December 2016) by Indian Veterinary Research Institute from samples of Panna Tiger Reserve.

The State Government agreed to the observation (September 2021).

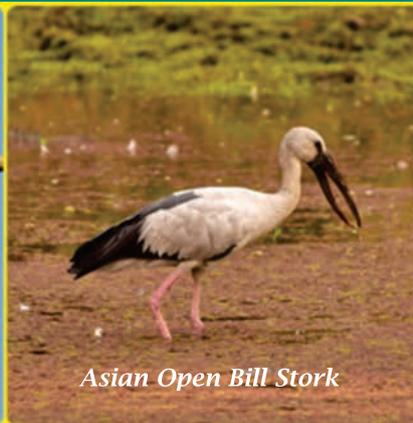
3.7 Recommendations

5. *The Department may identify the causative factor for high incidence of poaching and deaths and the hot spots to adopt site specific protection measures;*
6. *The State Government may speed up the process of establishment of Special Tiger Protection Force;*
7. *The Department may rationalize the sanction and deployment of human resource and other resources by laying down suitable norms and scales;*
8. *The Department may ensure that a site specific Human-Wildlife Conflict Mitigation Plan is prepared and implemented for each Tiger Reserve/ National Park/ Wildlife Sanctuary;*
9. *PCCF/ Wildlife may ensure implementation of disease control and surveillance programmes by providing adequate staff, training and infrastructure;*
10. *The Department may ensure that the activities and infrastructure related with tourism are rationalized so as to not disturb the well-being of wild animal and the habitats;*
11. *The State Government may remove bottlenecks in funding for activities relating to welfare activities for frontline staff.*

Chapter 4
Management and Consolidation of
Wildlife Habitats



Indian Grey Hornbill



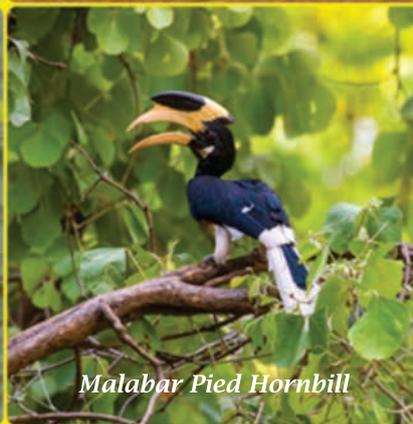
Asian Open Bill Stork



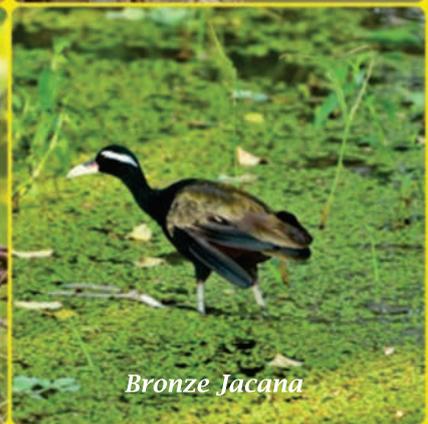
Black Rumped Flameback



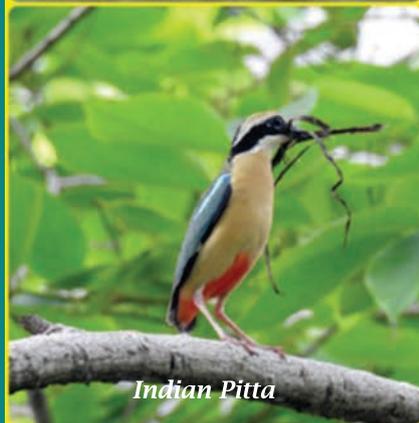
Common Teal



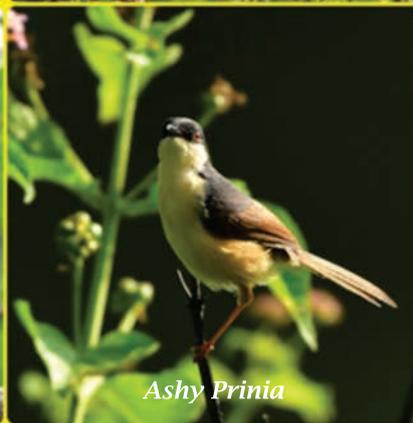
Malabar Pied Hornbill



Bronze Jacana



Indian Pitta



Ashy Prinia



Indian Vulture

Photo courtesy (From top, left to right):
Bhopal Birds, Abhinandan Shukla, Sanjay Dutt
Syed Tarique Kamaal, Faizan Khan, Abhinandan Shukla
Bhopal Birds, Abhinandan Shukla, Abhinandan Shukla

Chapter 4

Management and Consolidation of Wildlife Habitats

Summary

The 2nd National Wildlife Action Plan (2002-2016) emphasised the need for efforts to increase the extent of Protected Areas as a strategy for the protection of wildlife and biodiversity. We found that the process of notification of 645.84 square kilometer of land as Protected Areas could not be completed and almost 1,583.772 square kilometer could not be added to the area of Tiger Reserves in the State due to procedural and decision making delays.

The State Government had issued instructions to reconcile the Forest-Revenue boundary using Global Navigation Satellite System readings of boundary pillars, forest boundary map digitised by Forest Department, and cadastral maps digitised by Revenue Department. Our audit found that neither the reconciliation of Forest-Revenue boundary through digital maps and cadastral maps was done, nor adequate boundary survey was carried out in any of the 13 audited Divisions.

Lantana, *Sida*, *Parthenium*, *Casia tora* and *Van Tulsi* are the prominent invasive alien plant species found in the wildlife habitats in Madhya Pradesh. We found that only around 50 per cent of the planned work regarding their eradication could be executed by the Department.

For suitable management of water bodies, regular monitoring of availability of water in the water bodies is necessary. We did not notice any evidence of such an activity in the Divisions. Moreover, deficiencies like adverse impact of the change in water course in National Parks and Wildlife Sanctuaries, were not addressed for appropriate remedial action. Inadequacies in Fire Plans were noticed in Madhav National Park, Nauradehi Wildlife Sanctuary and Obedullaganj Division and adequate firefighting equipment was not available in audited divisions except Sanjay Tiger Reserve.

Anthropogenic activities, like expansion of farmlands, human habitats and illegal mining, are the prime threats responsible for deterioration and fragmentation of wildlife habitats. We noticed that regulation of commercial activities, traffic control and waste management in and around the Tiger Reserves was not adequate, leading to hindrance to wildlife movements and further fragmentation of wildlife habitats. An area of 6,942.906 hectare was reported to be under encroachment in eight out of 13 audited Divisions, out of which only the Divisional Forest Office, Obedullaganj reported eviction in 279.989 hectare of forest land during 2014-19. We noted with satisfaction that cases of illegal felling of trees had gradually reduced from 4,303 to 3,307 in 12 out of 13 audited Divisions. Cases of illegal felling increased in five Divisions while it decreased in seven other Divisions.

Relocation of villages in core segments of Protected Areas was delayed due to lack of adequate co-ordination between officers of Revenue and Forest Departments, pendency in payment of compensation, reoccupation of land, absence of consensus between management and public representatives, and delays in notifying relocated villages as forest land.

Habitat is a place where species live and includes resources required to foster self-sustaining population. Threats to habitat arise from various factors like:

- Forest Fires;
- Encroachment;
- Fragmentation of Forests;
- Invasive Alien Species.

The following paragraphs discuss our findings on management and consolidation of wildlife habitats in Madhya Pradesh.

4.1 Augmentation of Protected Areas and Tiger Reserves

The 2nd National Wildlife Action Plan (2002-2016) emphasised the need for efforts to increase the extent of Protected Areas as a strategy for the protection of wildlife and biodiversity. To maintain viable population of 80-100 tigers, an inviolate space of 800-1,200 square kilometer is required.

No new National Park or Wildlife Sanctuary had been notified in the State after January 2011 other than the re-notification of Kuno Wildlife Sanctuary as a National Park in October 2018. We also noted four instances where the State Government did not seize the opportunity of augmenting the areas. One such instance is in Box 4.1

Box 4.1: Protected Areas under Indira Sagar Project

Ministry of Environment, Forest and Climate Change granted forest clearance in October 1987 to Narmada Sagar Project, also known as Indira Sagar Project. The proposal for notification of five Protected Areas comprising of 696.91 square kilometer area was submitted (May 2005) to the State Government which was rejected on the ground that a large area is involved and this will restrict activities, such as fishing, tourism and agriculture, in that area and cause hardship to local people. The PCCF/ Wildlife again sent (December 2007) a proposal for constitution of Omkareshwar National Park (246.44 square kilometer), two Wildlife Sanctuaries (Singaji Wildlife Sanctuary for 177.11 square kilometer and Mandhata Wildlife Sanctuary for 68.75 square kilometer) and two Conservation Reserves (Narmada CR-1, 134.53 square kilometer and Narmada CR-2, 19.01 square kilometer) comprising a total area of 645.84 square kilometer to Government of Madhya Pradesh. There has been no progress in the matter since then.

The hindrances projected such as restriction on fishing, tourism, etc. were not causes for delay in the notifying Protected Areas, as these activities could easily be regulated by the concerned department.

The other three such cases of missed opportunities were in respect of adding:

- 227.55 square kilometer of inviolate Critical Tiger Habitat in Pench Tiger Reserve (Core), as envisaged in the Tiger Conservation Plan, even after more than 10 year since its approval in 2008-09;
- 1,244.518 square kilometer (763.812 square kilometer as Core Area and 480.706 square kilometer as Buffer) of proposed Ratapani Tiger Reserve after grant of in-principle approval by National Tiger Conservation Authority (August 2008); and
- 111.704 square kilometer area of Phen Wildlife Sanctuary as Tiger Reserve for which the PCCF/ Wildlife had sent a proposal for notification in March 2017.

The recurrent problem was delays in decision-making process at Division and Government levels. The details are given in **Appendix 4.1**. In the absence of notification under Wildlife (Protection) Act, 1972, various offences such as poaching, expansion of developmental activities could not be countered/ acted upon as per legal framework.

The State Government admitted the delays (July 2021).

4.2 Notification of Critical Wildlife Habitat

A Guideline published (2014) by Ministry of Tribal Affairs, Government of India for notification of Critical Wildlife Habitat, envisages the creation of inviolate spaces, i.e. Critical Wildlife Habitat within the National Parks and Wildlife Sanctuaries under Section 2(b) of Forest Rights Act, 2006. Three⁹⁸ National Parks and 10⁹⁹ Wildlife Sanctuaries which were not a part of any notified Critical Tiger Habitat were to be considered for notifying as Critical Wildlife Habitat in nine out of the 13 audited Divisions. However, the State Government did not notify any National Park/Wildlife Sanctuary as a Critical Wildlife Habitat. The Kanha Tiger Reserve submitted the proposal to notify Phen Wildlife Sanctuary as Critical Wildlife Habitat. Proposals for Nauradehi Wildlife Sanctuary and Madhav National Park could not be sent due to pending relocation of villages. No reason was assigned by other Divisions for the lapse.

Thus, mandatory requirement under Forest Rights Act, 2006 for keeping the National Park/Wildlife Sanctuaries inviolate for wildlife conservation was not fulfilled.

The State Government agreed to the observation (September 2021).

4.3 Notification of Protected Areas and re-settlement

The 2nd National Wildlife Action Plan (2002-16), envisages relocation and rehabilitation of villages on a voluntary basis or by persuasion from high conservation value and core segments of Protected Areas.

The State Government notifies declaration of intent to constitute any area as a Wildlife Sanctuary or National Park under Section 18 and 35 respectively of Wildlife (Protection) Act, 1972. The State Government had laid down the process of relocation of villages from Protected Areas, including Tiger Reserves, in 2008. After this, the Collectors of the areas concerned need to settle claims within two years of the notification of aforesaid declaration. After all claims have been received and settled by the Collectors, final notification of the Wildlife Sanctuary or National Park, specifying limits of the area, is issued by the State Government under Section 26 (A) and 35 (4) of Wildlife (Protection) Act, 1972 respectively. Further, the evacuated revenue villages were required to be notified as forest land as per provisions of the Indian Forest Act, 1927.

In the 13 audited Divisions, intention to constitute nine National Parks and 15 Wildlife Sanctuaries under Wildlife (Protection) Act, 1972 was notified between 1956 and 2018. Final notification was required to be issued under Wildlife (Protection) Act, 1972 after settlement of claims. The final notifications were issued (between August 1998 and September 2006) only

⁹⁸ Madhav, Kuno and Van Vihar.

⁹⁹ Bagdara, Gangau, Karera, Kheoni, Ken Gharial, Phen, Nauradehi, Singhori, Ratapani and Son Gharial.

for Pench National Park, Mowgli Wildlife Sanctuary and Kheoni Wildlife Sanctuary. In the remaining 21 selected Protected Areas, the final notifications were pending for varying periods from one to 44 years as on 2019.

97 revenue and 37 forest villages were proposed for relocation from eight¹⁰⁰ National Parks. Also, a total of 69 revenue villages and 29 forest villages were proposed to be relocated from nine¹⁰¹ Wildlife Sanctuaries. Relocation of five revenue and two forest villages were planned from Buffer Zones of three Tiger Reserve¹⁰². Out of the above, 171 revenue and 68 forest villages, only 111 revenue and 63 forest villages had been relocated up to May 2019. Details are shown in **Appendix 4.2**. We noted delays in finalisation of relocation process due to lack of adequate co-ordination between officers of Revenue and Forest Departments, pendency in payment of compensation to affected villegers, reoccupation of land, absence of consensus between management and public representatives, and not notifying relocated villages as forest land in six Divisions¹⁰³.

The State Government agreed (September 2021) to the observation.

4.4 Demarcation of boundaries

Well-demarcated boundaries are important precursors to protect, consolidate and properly manage Protected Areas. Towards that purpose, State Government issued (June 2017) instruction to superimpose Global Navigation Satellite System readings of boundary pillars, with forest boundary maps digitised by the Forest Department, and cadastral maps digitised by the Revenue Department, to reconcile the Forest-Revenue boundary. In case they match, five *per cent* boundary pillars were to be jointly inspected for confirmation. Data sheets thus finalised were to be digitally signed by the Collectors and the Divisional Forest Officers and to be published in websites of both the Departments. In case of disagreements between the Divisional Forest Officer and Collector, a committee presided by the Commissioner of the Revenue Division would take the final decision in this regard.

We noted that neither the reconciliation of Forest-Revenue boundary through digital maps and cadastral maps was done, nor boundary survey carried out in any of the 13 audited Divisions. No reasons were assigned for this lapse by the Field Directors/ Directors/ Divisional Forest Officers of the audited Divisions, except by two Divisions¹⁰⁴ where it was stated that the orders had not been received.

The State Government agreed (September 2021) to the observation.

4.5 Management of water bodies

The Protected Area managers are responsible for periodic assessment of the contribution of Protected Areas towards augmenting water resources of the region. Restoration and enhancement of water sources are to be done in all terrestrial Protected Areas. Listing of streams and rivers in these terrestrial Protected Areas, with estimates of flow and seasonal

¹⁰⁰ Bandhavagarh, Kanha, Kuno, Madhav, Panna, Pench, Sanjay and Satpura.

¹⁰¹ Bori, Gangau, Kheoni, Nauradehi, Pachmarhi, Panpatha, Phen, Ratapani and Sanjay Dubri.

¹⁰² Kanha, Panna and Satpura Tiger Reserves.

¹⁰³ Bandhavgarh, Nauradehi, Sanjay, Obedullaganj, Panna and Satpura.

¹⁰⁴ Madhav National Park and Sanjay Tiger Reserve.

duration must also be done. They should measure the lean season flow of water from Protected Areas, and illustrate how wildlife conservation through natural regeneration in catchment areas of water bodies and reservoirs can reduce siltation, and regulate year-round water flow¹⁰⁵.

In the 13 audited Divisions, there were 2,791 water bodies. A total of 393 artificial water bodies were constructed in eight¹⁰⁶ Protected Areas during 2014-19. List of streams and rivers in these Protected Areas was available in the Tiger Conservation Plans and Management Plans, but estimates of flow and seasonal duration were not recorded. There was no evidence that regular monitoring of the availability of water in these water bodies was done at Division level. Further, deficiencies like adverse impact of change in water course in National Parks and Wildlife Sanctuaries are detailed in **Appendix 4.3**.

Box 4.2: Changing water course to Sakhya Sagar Lake

Most of the sewage from the Shivpuri town flows in to the Jadhav Sagar Tank which acts as a settling tank and the decant, then overflows into the Sakhya Sagar lake in Madhav National Park which is home to Crocodiles and a variety of fishes, and also attracts many migratory birds.

Jadhav Sagar Lake, Sakhya Sagar Lake and Madhav Sagar Lake are connected through a stream in a series in the same order. According to a proposal for construction of a new Sewage Treatment Plant at Jadhav Sagar Lake, the effluent from this Plant was to be discharged in Barhi River.

Thus, after start of the functioning of the Sewage Treatment Plant, water from the Jadhav Sagar will no longer be flowing to the Sakhya Sagar and will affect the water level of the lake specially in summer, as Jadhav Sagar was the main source of water for the Sakhya Sagar. We noted that the Department had also not analysed the impact of change in water course to Sakhya Sagar due to the Sewage Treatment Plant. The Ministry of Environment, Forest and Climate Change, Government of India had granted first phase forest clearance to the Project in April 2018.

Further, as per the Management Plan of Madhav National Park, the nullah carrying all waste of Shivpuri town drains into Sakhya Sagar, leading to slow eutrophication.



Nullah leading to Sakhya Sagar Lake

(Photo: Audit Party)

¹⁰⁵ 2nd National Wildlife Action Plan (2002-16).

¹⁰⁶ Kanha Tiger Reserve (Core), Kanha Tiger Reserve (Buffer), Kuno Wildlife Sanctuary, Madhav National Park, Obedullaganj, Panna Tiger Reserve, Sanjay Tiger Reserve and Satpura Tiger Reserve.

Neither the Director nor the Committee for monitoring the Eco-Sensitive Zone took any action to divert this waste water influx to the Sakhya Sagar, which was hazardous to the wildlife of the National Park.

We concluded that sustainable management of water bodies was not being done.

The State Government agreed (September 2021) to the observation.

4.6 Forest fires

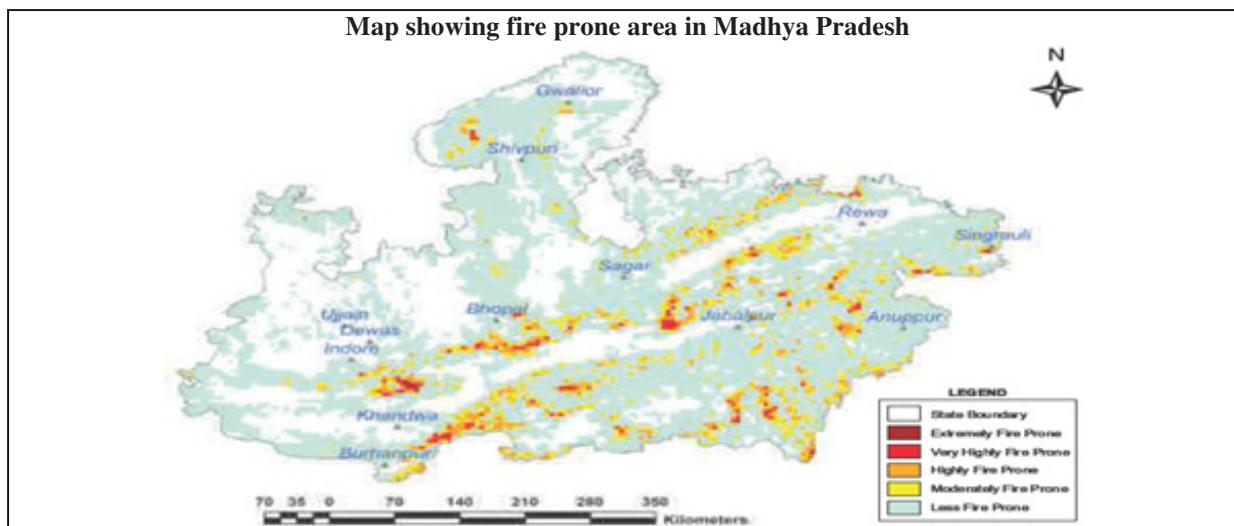
Forest fires have a deep, and often long-term effect on forest and wildlife. Fires harm micro fauna and flora of the habitat and destroy the organic matter which contributes to the humus content of the substratum. Fires also destroy the eggs of a number of ground nesting birds and reptiles. They compel animal and bird population to migrate randomly in various directions, which may disturb utilisation of a habitat in terms of both space and time. Many seeds and several plant species are completely destroyed by fire and their regeneration is affected adversely.

The India State of the Forest Report, 2019 published by the Forest Survey of India, Dehradun categorised the forest cover area in Madhya Pradesh under various classes, as shown in **Table 4.1** below:

Table 4.1: Forest cover area under various classes of fire proneness

(Area in per cent)

Extremely prone	Very highly prone	Highly prone	Moderately prone	Less prone
0.14	3.79	11.87	19.36	64.84



(Source: India State of Forest Report, 2019)

We noted that most of the Protected Areas are situated under fire-prone classes.

An area of 8,636 hectares of forest was affected by fire in 1,737 cases, during 2014-18 in 12 out of the 13 audited Divisions. But its impact on the habitat was not analysed by the Management of these Tiger Reserves/ Protected Areas.

In the 13 audited Divisions, fire control activities, such as fire-line cleaning and burning in 1,15,189.36 kilometer of fire-lines was done during 2014-19. We noted that Madhav National Park, Nauradehi Wildlife Sanctuary and Obedullaganj Division did not prepare Fire Plans. In Nauradehi Wildlife Sanctuary, only 30 per cent of the fund sanctioned for wages of

firewatchers in 2018-19 was spent and during the same year, the highest area of 394.50 hectares was affected by fire in the very same Wildlife Sanctuary.

Meetings/ training were held to sensitise local people in Kanha (Core and Buffer), Bandhavgarh, Pench, Panna and Satpura Tiger Reserves. In the rest of the Divisions, meetings/ training were not held.

The National Action Plan on Forest Fire suggests that fire fighters should be provided with adequate fire-fighting equipment, including leaf litter blowers and protective clothing. These equipment were not available in audited units, except in Sanjay Tiger Reserve, where fire-fighting kit and air blower had been used.

The Managers of 12 out of 13 audited Divisions, used only fire-beaters¹⁰⁷ for fire control. In Kuno National Park, requirement of 500 fire-beaters was assessed, but only 265 fire-beaters were procured. Fire-beaters can put out fire in open areas only within its limited reach.

The State Government agreed (September 2021) to the observation.

4.7 Meadow Development and Eradication of Invasive Alien Species

Lantana, *Sida*, *Parthenium*, *Casia tora* and *Van Tulsi* are the more prominent invasive alien plant species found in the wildlife habitats in Madhya Pradesh. However, on site specific basis, *Lantana* was also considered as suitable for hunting, resting and breeding ground for Tigers and their co-predators. Habitat improvement activities include meadow development, weed/ lantana eradication and mopping. Regular mopping ensures that weeds do not regenerate in the same area from where it was removed. Progress of habitat improvement activities in Tiger Reserves and Protected Areas in 13 audited Divisions during 2014-19 is shown in **Table 4.2** below:

Table 4.2: Habitat improvement activities in Tiger Reserves, National Parks/ Wildlife Sanctuaries during 2014-19

(Area in Hectares and amount in ₹ crore)

Sl. No.	Activity	No. of Tiger Reserves/ Protected Areas	Demanded in Annual Plan of Operation		Work Sanctioned by Government of India		Executed work	
			Area	Amount	Area	Amount	Area	Amount
1	Meadow Development	12 ¹⁰⁸	5,388.30	5.26	2,696.55	2.58	2,460.30 (46 per cent)	2.05
2	Weed/ Lantana Eradication	15 ¹⁰⁹	37,576.10	14.34	22,648.50	7.38	19,573.50 (52 per cent)	6.49
3	Weed/ Lantana Mopping	6 ¹¹⁰	13,481.00	2.35	7,691.00	0.96	4,638.00 (34 per cent)	0.50

¹⁰⁷ Fire-beater is a tool made out of a handle and rubber beater.

¹⁰⁸ Bandhavgarh Tiger Reserve, Kanha (Buffer) Tiger Reserve, Kanha (Core) Tiger Reserve, Pench Tiger Reserve, Sanjay Tiger Reserve, Satpura Tiger Reserve, Van Vihar National Park, Karera Wildlife Sanctuary, Bagdara Wildlife Sanctuary, Ratapani Wildlife Sanctuary, Son Gharial Wildlife Sanctuary and Kheoni Wildlife Sanctuary.

¹⁰⁹ Bagdara Wildlife Sanctuary, Bandhavgarh Tiger Reserve, Gangau Wildlife Sanctuary, Kanha (Core) Tiger Reserve, Madhav National Park, Kuno National Park, Nauradehi Wildlife Sanctuary, Panna Tiger Reserve, Pench Tiger Reserve, Phen Wildlife Sanctuary, Ratapani Wildlife Sanctuary, Sanjay Tiger Reserve, Satpura Tiger Reserve, Singhori Wildlife Sanctuary and Van Vihar National Park.

¹¹⁰ Kanha (Buffer) Tiger Reserve, Kanha (Core) Tiger Reserve, Madhav National Park, Panna Tiger Reserve, Pench Tiger Reserve and Van Vihar National Park.

Thus, the work executed was around 50 per cent of that planned, mainly due to cut of 50 per cent funds by Government of India (although ₹ 1.88 crore of sanctioned funds remained unspent).

Further, seven¹¹¹ Tiger Reserves/ National Parks/ Wildlife Sanctuaries, from which 5,620.00 hectares of weed/ lantana was eradicated in previous years (during 2014-15 to 2017-18) did not demand fund for mopping in succeeding years.

The State Government agreed (September 2021) to the observation.

4.8 Anthropogenic activities

Anthropogenic activities, like expansion of farmlands, human habitats and illegal mining, are the prime threats responsible for deterioration and fragmentation of wildlife habitats.

4.8.1 Regulation of Commercial activities in and around Tiger Reserves

Mushrooming of commercial activity induced infrastructure, such as buildings, hotels, resorts, fencings, etc. lead to dumping of waste around the Tiger Reserves, causing disruption to free wildlife movement and leading to fragmentations of wildlife habitats. These commercial activities mostly take place in Buffer Zones of Tiger Reserves.

A Local Advisory Committee was constituted for each Tiger Reserve by the State Government, headed by the Divisional Commissioner and the Field Director as Member Secretary to review tourism strategy and ensure site-specific norms on buildings and infrastructure in areas inside and close to the Tiger Reserves, keeping in view the corridor value and ecological aesthetics¹¹². At least half-yearly meetings of the Local Advisory Committee were to be held. The deficiencies noticed during the audit are shown in brief in **Table 4.3** and detailed in **Appendix 4.4**.

Table 4.3: Deficiencies in working of Local Advisory Committee

Sl. No.	Tiger Reserve	Deficiencies
1	Bandhavgarh Tiger Reserve	<ul style="list-style-type: none"> The Local Advisory Committee held only five meetings during 2014-19 instead of the minimum 10 meetings required. Night traffic in Tala-Dhamokhar Road, though prohibited, was also not controlled. The Local Advisory Committee did not review the tourism strategy or site specific norms on buildings.
2	Pench Tiger Reserve	<ul style="list-style-type: none"> Only two meetings of the Local Advisory Committee were held in Pench Tiger Reserve instead of the minimum 10 required. The Local Advisory Committee did not monitor implementation of its decisions, like tourist activity around the Tiger Reserve, type of construction, details of employed persons, etc. It did not advise the State Government in any of the matters as was mandated.
3	Panna Tiger Reserve	<ul style="list-style-type: none"> Only three meetings of the Local Advisory Committee were held during 2014-19 against the envisaged minimum 10 meetings. No action was taken by the Local Advisory Committee to resolve the problem of dumping the waste in areas inside the Panna Tiger Reserve by the Panna Municipality.
4	Kanha Tiger Reserve	<ul style="list-style-type: none"> Only six meetings of the Local Advisory Committee were held during 2014-19 as against the minimum of 10 meetings required.

¹¹¹ Bandhavgarh Tiger Reserve, Phen Wildlife Sanctuary, Madhav National Park, Nauradehi Wildlife Sanctuary, Ratapani Wildlife Sanctuary, Sanjay Tiger Reserve and Singhori Wildlife Sanctuary.

¹¹² Para 2.1.8 of Guidelines for Developing State Tourism Strategy for Tiger Reserves, by National Tiger Conservation Authority, October 2012.

		<ul style="list-style-type: none"> No follow-up by Local Advisory Committee of its own decisions on removal of the fencing from hotels/ resorts/ buildings and other commercial infrastructures, as well as on undertaking scientific study of impacts of tourism on wildlife of Core and Buffer Areas.
5	Satpura Tiger Reserve	<ul style="list-style-type: none"> Compliance reports to the meetings had not been received in the office of the Field Director from members of other Departments, indicating poor monitoring by the committee of the commercial activities in and around the Tiger Reserve. Lack of management of waste generated by the hotels/ restaurants in and around the Tiger Reserve. New infrastructures which came, or are coming up around the Reserve were not mandated to obtain clearance from the Local Advisory Committee. No action was taken regarding solid waste management in tourism areas of Churna and Madhai.

(Source: Forest Department)

Thus, regulation of commercial activities, traffic and waste management in and around the Tiger Reserve was not adequate, leading to hindrance to wildlife movement and fragmentation of wildlife habitats.

The State Government agreed (September 2021) to the observation.

4.8.2 Anthropogenic Activities in Wildlife Habitats

Section 35 (6) of the Wildlife (Protection) Act, 1972 provides that no person shall destroy or damage or divert the habitat of any wild animal by any act except under, and in accordance with, a permit granted by the Chief Wild Life Warden. Section 34 A (1) of the same Act empowers a forest officer, not less than the rank of Assistant Conservator of Forests, to eject encroachers from un-authorized possessions in National Parks or Wildlife Sanctuaries.

4.8.2.1 Encroachments

An area of 6,942.906 hectares was reported to be under encroachment in eight¹¹³ out of the 13 audited Divisions as shown in **Appendix 4.5**. Out of the 13 Divisions, only the Divisional Forest Office, Obedullaganj reported eviction in 279.989 hectares of forest land during 2014-19.

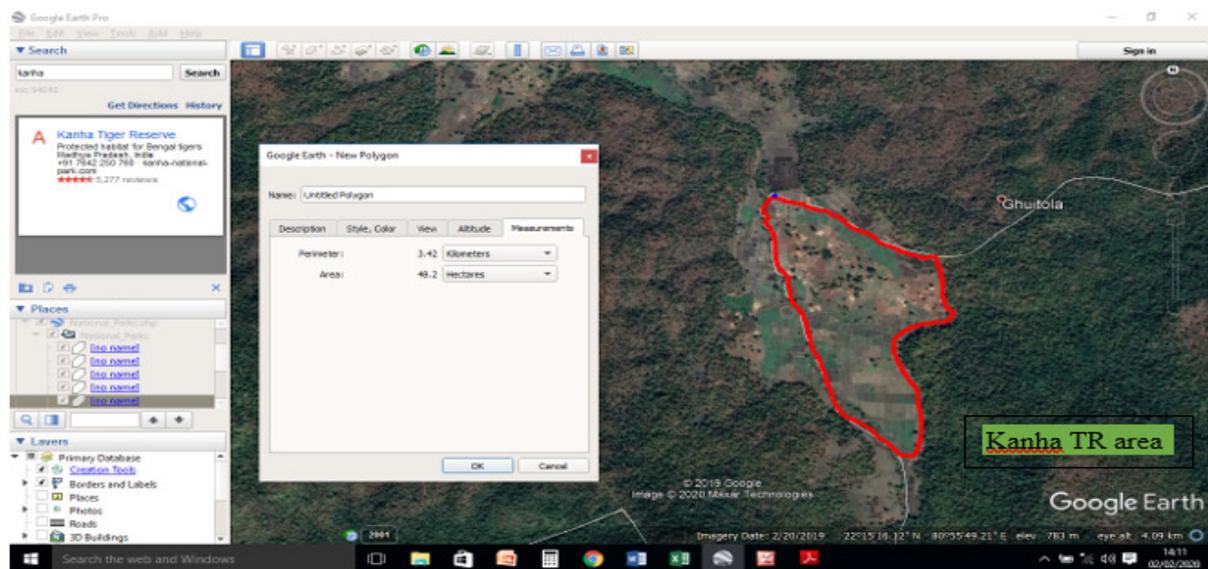
The Field Directors of Kanha Tiger Reserve (Buffer), Pench Tiger Reserve and Satpura Tiger Reserve informed zero encroachment in their Divisions and the Field Director, Sanjay Tiger Reserve informed encroachment in 475.376 hectares under his jurisdiction. However, this data did not match with Tiger Conservation Plans, status report on encroachments, etc., which showed encroachment in 6,279.20 hectares in these Tiger Reserves. Discrepancies in data of encroachments in these Divisions as well as poor management of encroachments noticed in Nauradehi Wildlife Sanctuary and Madhav National Park are shown in details in **Appendix 4.6**.

The Field Director, Kanha Tiger Reserve (Core) also reported 'Nil' encroachment in the Division. However, as per the Tiger Conservation Plan of Kanha Tiger Reserve, the total area of Kanha National Park is 940.00 square kilometer and 17¹¹⁴ villages existed inside it. An

¹¹³ Bandhavgarh Tiger Reserve, Kheoni Wildlife Sanctuary, Kuno National Park, Madhav National Park, Nauradehi Wildlife Sanctuary, Panna Tiger Reserve, Sanjay Tiger Reserve and Obedullaganj Division.

¹¹⁴ Ajanpur, Benda, Bhilwani, Bithli, Chatarpur, Dhaniajhor, Jhapul, Janglikheda, Jholar, Kadla, Kariwah, Linga, Mukki, Patuwa, Ranwahi, Role and Sukdi.

invioate area of 917.43 square kilometer was notified as Critical Tiger Habitat of the Kanha Tiger Reserve. But 22.57 square kilometer area, which is not a part of the Critical Tiger Habitat of Kanha Tiger Reserve, has 17 villages within it. We superimposed digital boundary map of Kanha National Park of the Forest Department with Google Earth image, which showed land use changes from forests to agriculture and houses in an area of about 48.20 hectares village/habitation inside the National Park boundary. The name of this village habitation is not even included in the list of 17 villages that are still a part of the Kanha National Park. Screenshots of Google Earth images can be seen below, as on February 2019:



However, the Management was not aware of this encroachment in 48.20 hectares of land inside the Kanha Tiger Reserve. In reply, the PCCF/ Wildlife stated (January 2021) that on enquiry it was found to be an old (from prior to 1948) habitation in the area.

The State Government stated (July 2021) that the area shown is part of village Bhuitola, which is not a part of the Critical Tiger Habitat. However, as mentioned above, the village is also not included in the list of 17 villages that are still located inside the Kanha National Park. Thus, the status of the village is ambiguous as to whether the village is situated inside the notified Core Area of the Tiger Reserve, or is inside the area of the National Park but outside the Core Area.

4.8.2.2 Illegal mining in Son Gharial Wildlife Sanctuary

The Son Gharial Wildlife Sanctuary, notified in 1981, is located across Sidhi, Singrauli, Satna and Shahdol Districts and is spread out over 209 kilometers. It has a width of 200 meters on both river banks of Son, Gopad and Banas Rivers. The Wildlife Sanctuary supports many exotic species of aquatic flora and fauna, such as Indian Skimmer, Gharial, Mugger, Otter, Dolphin and Turtle, many of which are on the threatened or endangered list of International Union for Conservation of Nature.



Photo source: Management Plan (2020-21 to 2029-30) of Son Gharial Wildlife Sanctuary

We noted that between 2014 and 2018, a total of 355 cases of illegal sand mining were registered in/ near this Wildlife Sanctuary. Out of these 23 cases (6.5 *per cent*) were compounded and only 26 cases (7.3 *per cent*) were submitted to the courts for legal proceedings. The remaining 86.2 *per cent* cases were pending investigation with the forest officers.

Control on illegal mining was clearly deficient, as evident from the delay in investigation. Given that illegal mining in the river beds, particularly in summers, can play havoc with the extremely fragile eco-system, this laxity of the Department can have a detrimental effect on this unique habitat.

The State Government stated (July 2021) that 84 field staff are working in four Ranges of the Son-Gharial Wildlife Sanctuary. However, the fact is that during the period of audit only 26 field staff under one Range were managing the entire length of 209 kilometer of this Wildlife Sanctuary. Further, the reply was silent about the status of control over illegal activities in the Son-Gharial Wildlife Sanctuary.

4.8.3 *Illegal felling and removal of timber and fuel wood from forests*

Illegal felling of trees fragment forests and also destroys the nests and shelters of many birds, forcing them to escape from the area, along with adverse impact on the water regime of the area.

Collection of fuel wood from Protected Areas is allowed only for meeting the personal bona fide need of the people living in and around the Protected Areas under the Wildlife (Protection)

Act, 1972. Demand of fuel wood from forests causes resource degradation to the extent that collection exceeds sustainable yield¹¹⁵. This also results in reduction of forest cover and impacts adversely on biodiversity in the wildlife habitat.

A study conducted by the Forest Survey of India between September 2018 and June 2019 in 31 States/ Union Territories revealed that Madhya Pradesh was fourth in felling of fuel wood and highest in removal¹¹⁶ of fodder, small timber and bamboo.

We noted that cases of illegal felling of trees had gradually reduced from 4,303 to 3,307 in the 12 out of 13 audited Divisions during the period of 2014 to 2018. Cases increased in five¹¹⁷ Divisions while they decreased in seven¹¹⁸ other Divisions. Details may be seen at **Table 4.4** below:

Table 4.4: Year-wise and Division-wise reported cases of illegal tree felling and felled trees

Sl. No.	Division	Number of cases of illegal felling of trees					Total cases	Total trees felled
		2014	2015	2016	2017	2018		
1	Kanha Tiger Reserve (Core)	54	65	33	29	21	202	773
2	Panna Tiger Reserve	460	374	224	350	201	1609	6458
3	Pench Tiger Reserve	407	386	335	281	218	1627	5670
4	Sanjay Tiger Reserve	42	24	94	132	88	380	418
5	Kuno National Park	64	63	24	15	32	198	1552
6	Nauradehi Wildlife Sanctuary	1240	709	1180	998	919	5046	10059
7	Madhav National Park	20	31	43	49	23	166	894
8	Obedullaganj Division	649	630	581	841	671	3372	19681
9	Bandhavgarh Tiger Reserve	250	371	372	719	270	1982	8471
10	Satpura Tiger Reserve	219	216	168	48	10	661	2450
11	Kanha Tiger Reserve (Buffer)	566	611	598	580	610	2965	7771
12	Kheoni Wildlife Sanctuary (Dewas Division)	332	286	272	271	244	1405	5388
Total		4303	3766	3924	4313	3307	19613	69585

(Source: Forest Department)

The Nauradehi Wildlife Sanctuary, Obedullaganj Division (Ratapani and Singhori Wildlife Sanctuaries), Kanha (Buffer), Kheoni Wildlife Sanctuary and Bandhavgarh Tiger Reserve were more prone to illegal felling, though the total number of cases had decreased during the period of review.

In order to reduce dependency of the people from fuel wood from forests, Liquefied Petroleum Gas connections were distributed but only in Kanha, Panna, Pench and Satpura Tiger Reserves. Only Pench Tiger Reserve intimated that about 80 *per cent* of the beneficiaries were refilling the cylinder and in the remaining three Tiger Reserves, survey for refilling was not done. Further, the Field Directors did not assess whether dependency of the villagers on forest for

¹¹⁵ Fuelwood Consumption and Forest Degradation: A Household Model for Domestic Energy Substitution in Rural India, Rasmus Heltberg, Thomas Channing Arndt and N Udaya Sekhar, Land Economics (May 2000).

¹¹⁶ Chapter 10 of India State of Forest Report 2019.

¹¹⁷ Bandhavgarh Tiger Reserve, Kanha Tiger Reserve (Buffer), Madhav National Park, Obedullaganj Division and Sanjay Tiger Reserve.

¹¹⁸ Dewas Division, Kanha (Core) Tiger Reserve, Kuno National Park, Nauradehi Wildlife Sanctuary, Pench Tiger Reserve, Panna Tiger Reserve and Satpura Tiger Reserve.

fuel wood had reduced or not after distribution of Liquefied Petroleum Gas, for the purpose of future planning in this regard.

The State Government stated (July 2021) that the data as shown in the Forest Survey of India study do not relate to the Protected Areas of Madhya Pradesh. However, the reply was silent about the increasing trend of illegal felling cases in the aforementioned Divisions and not assessing the impact of Liquefied Petroleum Gas distribution on fuel wood removal.

4.9 Impact of major projects on wildlife habitats

Major projects, such as dams, railways and roads, constitute predominant linear infrastructure. With plans to substantial expansion, they pose the greatest threat of harmful impact on wildlife. They also result in shrinking and fragmentation of wildlife habitat. Few such instances are discussed below:

Box 4.3: Ken-Betwa Link Project

The 2nd National Wildlife Action Plan (2002-16) envisages documentation and assessment of damage done by large projects and intrusions, such as dams, mines, roads, etc. One of the largest projects in rivers of Madhya Pradesh is Ken-Betwa Link Project.

The Ken-Betwa Link Project was initiated by the Government of India (August 2005) to provide irrigation to more than five lakh hectares area, hydro power and drinking water to a large population in Bundelkhand region of Uttar Pradesh and Madhya Pradesh, requiring 6,017.00 hectares of forest land, including 5,578.92 hectares of land of the Core and Buffer Zones of the Panna Tiger Reserve. The Project was cleared (September 2015) by the State Board for Wildlife. Clearance by the National Board for Wildlife was under consideration in the Hon'ble Supreme Court of India (June 2019).

Three main concerns were raised (September 2015) by the Field Director, Panna Tiger Reserve as the consequence of the Project on Panna Tiger Reserve, being:

1. Direct destruction of about one-fourth of Critical Tiger Habitat of Panna Tiger Reserve to the tune of 58.03 square kilometer (10.07 *per cent*) and indirect loss of Critical Tiger Habitat area to the tune of 105.23 square kilometer (18.26 *per cent*);
2. The Ken valley within the Core Zone of Panna Tiger Reserve constitutes a unique habitat for seven¹¹⁹ out of the nine vulture species found in India. In terms of breeding behavior, vultures nest on the sheer cliffs found along the Ken river within this Tiger Reserve. Due to fragmentation and loss of connectivity, about 50 *per cent* of the unique habitats of a highly endangered vulture species, including its nesting sites, will be lost;
3. About 11 lakh trees will be removed and there will be stoppage and diversion of the monsoon flow of water in the Ken River;

The Field Director also stated that the Project proponent had listed a number of measures to mitigate some of the losses and decision in this regard may be taken with holistic view at the appropriate level.

¹¹⁹ Resident Vulture species; (1) Red-headed, (2) White-backed, (3) Long-billed or Indian, (4) Egyptian, (5) Eurasian Griffon, (6) Himalayan Griffon, (7) Cinereous.

The PCCF/ Wildlife also agreed (September 2015) with the concerns raised by the Field Director, Panna Tiger Reserve and stated that loss of forest and prime habitat of Tiger and Vulture is inevitable. Further, National Tiger Conservation Authority has recommended to add additional satellite core area and with the conditions as per the recommendation of the State Wildlife Board.



Vulture habitat in cliffs of Panna Tiger Reserve likely to be submerged after implementation of the Project

(Photo taken by Audit Party during field visit)

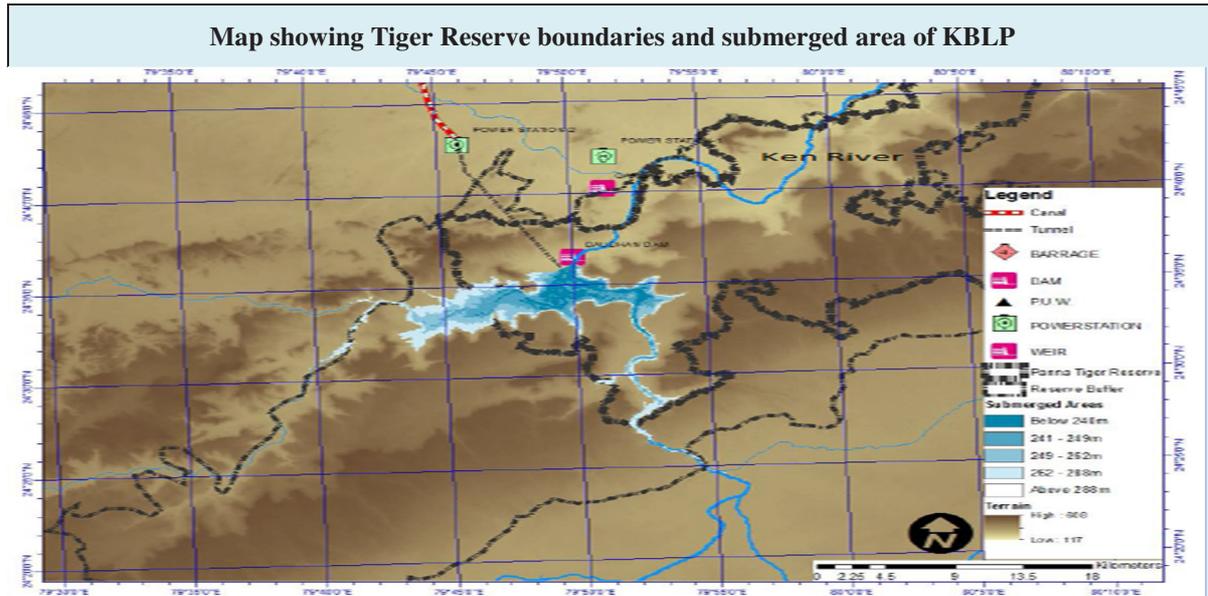


Ken River in Panna Tiger Reserve

(Photo courtesy: NBWL Standing Committee Report, August 2016)

A Report¹²⁰ published in ‘International Journal for Research in Applied Science and Engineering Technology’ in June 2017 also concluded that the likely submerged region will divide the Panna Tiger Reserve into two parts across the river, leading to loss of connectivity to the wildlife in the Tiger Reserve.

¹²⁰ Rakesh Kumar, Himanshu Saluja, Assistant Professor, Amity School of Architecture and Planning, Amity University Gurgaon.



(Source: International Journal for Research in Applied Science and Engineering Technology)

The State Wildlife Board while recommending the Project (September 2015) mainly proposed following mitigation measures:

1. Additional forest area may be added toward east of effected core area.
2. Landscape Management Planning by Wildlife Institute of India for strengthening of Wildlife Corridor.
3. Study on mitigation on impact to Vulture habitat by Bombay Natural History Society.
4. Ensuring ecological flow in Ken River below the dam.

The PCCF/ Wildlife stated (June 2019) that mitigation measures will be implemented and Wildlife will be increased as a result of increase in water level as well as increase in grasslands due to more open space on account of receding water from the reservoir.

The State Government stated (July 2021) that after the Ken-Betwa Link Project was approved by the State Board for Wild Life and National Board for Wild Life, the Government of India has granted in-principle approval to the Ken-Betwa Link Project after providing all mitigation measures to control the adverse impacts on wildlife habitat.

GoI has approved the funding and implementation of Ken-Betwa Link Project (December 2021). Statedly, this project also comprehensively provides for environment management and safeguards. For this purpose a comprehensive landscape management plan is under finalisation by Wildlife Institute of India.

The State Government may consider forming an expert committee to specifically monitor the adequacy and timeliness of mitigation measures.

4.9.1 Impact of other major projects on wildlife habitats

The result of our examination of four other major Projects which have been undertaken/ wildlife clearance accorded in Tiger Reserves are mentioned in **Table 4.5** below:

Table 4.5: Major Projects in Tiger Reserves

Sl. No.	Division	Activity	Observation
1	Pench Tiger Reserve	Construction of Machagora Dam	Due to the construction, the flow of water into the Totladoh Dam in the Core zone of Tiger Reserve changed. Field Director had not made any assessment of impacts on wildlife habitat in construction of Machagora dam at upstream.
2	Pench Tiger Reserve	Road widening in National Highway-7	Central Empowered Committee's recommendation of diverting the NH-7 through Chhindwara was ignored, causing irreparable damage, fragmentation and destruction to the wildlife habitat.
3	Panna Tiger Reserve	Diamond mining in Panna Tiger Reserve	Mine Closure Plan was not submitted and critical tiger habitat is being harmed by the water mixed with kimberlite released from the mine.
4	Satpura Tiger Reserve	Construction of Sontalai-Bagratawa Railway Line	Monitoring committee was not formed as per directions of National Board for Wildlife and no progress reports of execution of project sent by Field Director to Principal Chief Conservator of Forest/ Wildlife. Division was unaware about mitigation measures taken in the construction of the rail line.

Details of the above are given in **Appendix 4.7**. Thus, there was adverse impacts due to aforesaid developmental activities on these areas resulting into reduction and fragmentation of habitats and ecological area for the native wildlife species.

The State Government agreed (September 2021) to the observation.

4.10 Recommendations

12. *The State Government may complete the processes of demarcating boundaries of Protected Areas and Tiger Reserves by using digital and cadastral maps;*
13. *The control of illegal mining in Son-Gharial Wildlife Sanctuary may be strengthened by speeding up the investigations of registered cases;*
14. *The State Government may ensure that all adverse impacts on Ken-Betwa River Linking Project as well as other infrastructure development projects on the wildlife and their habitats are adequately mitigated. Further, the State Government may consider forming an expert committee to specifically monitor the adequacy and timeliness of mitigation measures.*

4.11 Conclusion

We audited 13 out of 22 Divisions connected with Tiger Reserves, National Parks and Wildlife Sanctuaries for the period 2014-19 and found that conservation suffered from gaps in long-term perspective planning. Tiger Conservation Plans and Management Plans were not prepared and adequately supported by research.

While the number of Tigers has increased from 308 to 526 in the State during 2014-18, cases of death of Tiger and Leopard by poaching, electrocution, snare and accidents near roads and railway tracks continued unabated. Adequate monitoring like use of available technology through M-STripes, could have significantly improved the Department's capabilities even with limited resources. The Department was operating with significant shortage of personnel

and lack of equipment like arms and wireless sets. Special Tiger Protection Force earmarked for protection of Tigers had also not been constituted.

Forest offences in the sampled Divisions seemed to be processed within a reasonable span of time, with four-fifth of the cases during the audit period either been compounded or submitted to the Courts. However, one-fifth of these cases remained pending for significant periods, which needed to be speeded up.

We noticed certain lacunae in protecting, consolidating and expanding the Protected Areas. Final notifications of Protected Areas were pending in many cases, process of relocation of villages and villagers were not completed, cases of Human-Wildlife Conflicts were increasing, spread of invasive alien plants could not be arrested and ecologically fragile eco-systems could not be adequately managed.

Commendable achievement was made in translocation of wildlife to different Protected Areas within the State. Barring an unsuccessful attempt to translocate the Tigers to Odisha, all intra-state translocations have largely succeeded.

In India, Madhya Pradesh holds a special pride of place, being the State with the highest forest cover and a plethora of Wildlife. We encourage the Department to address the issues pointed out in this Report for sustainable conservation of wildlife in the forests of the State.

Bhopal
The 28 April 2022


(BIJIT KUMAR MUKHERJEE)
Accountant General (Audit-II)
Madhya Pradesh

Countersigned

New Delhi
The 02 May 2022


(GIRISH CHANDRA MURMU)
Comptroller and Auditor General of India

Appendices

Appendix 1.1

(Reference: Paragraph 1.3)

Allotment and expenditure under Centrally Sponsored Scheme and State Schemes

(₹ in crore)

Sl. No.	Name of the Scheme	Allotment	Expenditure	(+Savings/ -)Excess	
				Amount	Per cent
1	2	3	4	5	6
1	Centrally Sponsored Scheme	575.78	633.32	(-) 57.54	(-) 9.99
State Schemes					
1	National Park	490.67	483.37	7.30	1.49
2	Compensation for human casualties by wild animals	49.77	50.01	(-) 0.24	(-) 0.48
3	Compensation for relocation of villages	685.05	642.47	42.59	6.22
4	Wildlife management outside Protected areas	175.27	90.07	85.21	48.61
Total		1400.77	1265.92	134.86	9.63

(Source: Appropriation Accounts)

Appendix 1.2

(Reference: Paragraph 1.5)

Administrative Units for Management of Wildlife

Sl. No.	Name of Administrative Unit	National Parks/ Sanctuaries under the Management
Tiger Reserves		
1	Kanha	Kanha National Park Phen Wildlife Sanctuary
2	Bandhavgarh	Bandhavgarh National Park Panpatha Wildlife Sanctuary
3	Satpura	Satpura National Park Pachmari Wildlife Sanctuary Bori Wildlife Sanctuary
4	Panna	Panna National Park Gangau Wildlife Sanctuary Ken Gharial Wildlife Sanctuary
5	Pench	Pench National Park Pench Mowgli Wildlife Sanctuary
6	Sanjay	Sanjay National Park Sanjay Dubri Wildlife Sanctuary Bagdara Wildlife Sanctuary Son Gharial Wildlife Sanctuary
National Parks Under Wildlife Divisions		
7	Madhav National Park	Madhav National Park Karera Wildlife Sanctuary
8	Kuno National Park	Kuno National Park
9	Van Vihar National Park	Van Vihar National Park
Wildlife Sanctuaries Managed by Territorial Divisions		
10	Dindori	Fossil National Park
11	Dhar	Dinosaur National Park Sardarpur Wildlife Sanctuary
12	Ratlam	Sailana Wildlife Sanctuary
13	Gwalior	Son Chidiya Wildlife Sanctuary
14	Mandsaur	Gandhi Sagar Wildlife Sanctuary
15	Nauradehi	Nauradehi Wildlife Sanctuary
16	Morena	Chambal Wildlife Sanctuary
17	Tikamgarh	Orchha Wildlife Sanctuary
18	Damoh	Virangana Durgavati Wildlife Sanctuary
19	Rajgarh	Narsinghgarh Wildlife Sanctuary
20	Obedullaganj	Ratapani Wildlife Sanctuary Singhori Wildlife Sanctuary
21	Dewas	Kheoni Wildlife Sanctuary
22	Indore	Ralamandal Wildlife Sanctuary

(Source: Forest Department)

Appendix 1.3

(Reference: Paragraph 1.5)

National Parks and Wildlife Sanctuaries under management of audited Divisions

Sl. No.	Division	Tiger Reserve	National Park	Wildlife Sanctuary
1	Kanha Tiger Reserve (Core)	Kanha Tiger Reserve	Kanha National Park	Phen Wildlife Sanctuary
2	Kanha Tiger Reserve (Buffer)	Kanha Tiger Reserve	--	--
3	Bandhavgarh Tiger Reserve	Bandhavgarh Tiger Reserve	Bandhavgarh National Park	Panpatha Wildlife Sanctuary
4	Pench Tiger Reserve	Pench Tiger Reserve	Pench National Park	Pench Mowgli Wildlife Sanctuary
5	Panna Tiger Reserve	Panna Tiger Reserve	Panna National Park	Gangau and Ken Gharial Wildlife Sanctuaries
6	Sanjay Tiger Reserve	Sanjay Tiger Reserve	Sanjay National Park	Sanjay Dubri, Bagdara and Son Gharial Wildlife Sanctuaries
7	Satpura Tiger Reserve	Satpura Tiger Reserve	Satpura National Park	Bori and Pachmari Wildlife Sanctuaries
8	Madhav National Park	--	Madhav National Park	Karera Wildlife Sanctuary
9	Kuno Wildlife Division	--	Kuno National Park	--
10	Van Vihar National Park	--	Van Vihar National Park	--
11	Nauradehi Division	--	--	Nauradehi Wildlife Sanctuary
12	Obedullaganj Division	--	--	Ratapani and Singhori Wildlife Sanctuaries
13	Dewas (General) Division	--	--	Kheoni Wildlife Sanctuary

Appendix 2.1

(Reference: Paragraph 2.2.3)

Status of management of various Corridors

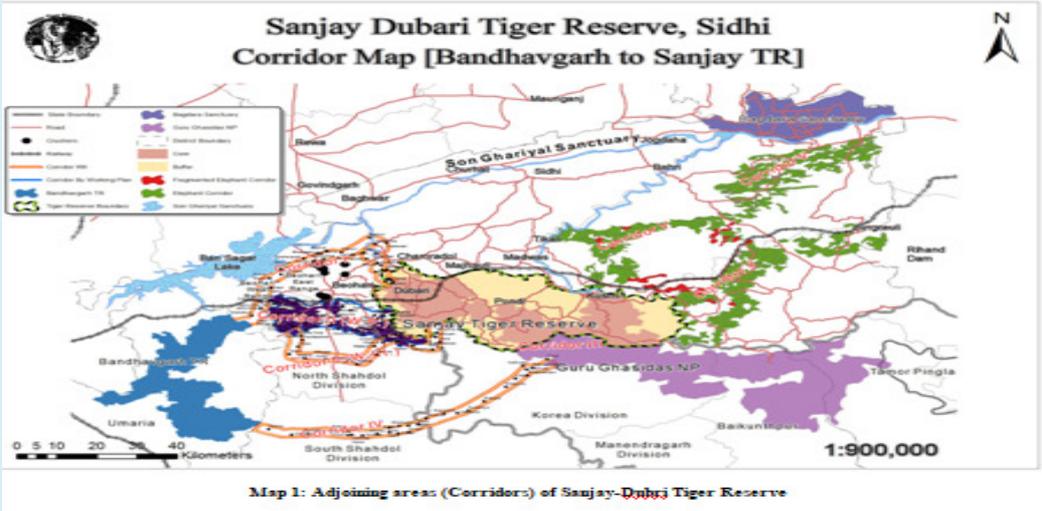
Sl. No.	Status of management of various Corridors
1	<p>Kanha-Pench</p> <p>Kanha-Pench Corridor is one of the most important forest corridors in India and facilitates tiger dispersal between Kanha and Pench Tiger Reserves. The corridor is an extensive tract of wildlife habitat covering an area of over 16,000 square kilometre all in Madhya Pradesh. It also acts as a refuge for several other mammals such as wild dogs, sloth bear, leopard, indian wolf, hyena, jackal, sambar, gaur, chital etc. Without linkages from source population such as Kanha, isolated populations face the risk of extinction due to poaching and loss in genetic vigor over generations.</p> <p>In this forest corridor there are several segments which are extremely narrow or patchy. These segments are areas of concern, being areas with severely reduced connectivity with regard to animal presence and movements.</p> <p>Kanha- Navegaon-Nagzira-Tadoba-Indravati</p> <p>This corridor is weakest at State junction of Madhya Pradesh, Maharashtra and Chhattisgarh where the forest connectivity is in the form of fragmented patches but the landscape matrix is not entirely hostile to tiger movement and gene flow currently exists under prevailing Land Use Land Cover.</p> <p>Kanha-Achanakmar</p> <p>The Kanha-Achanakmar forest corridor is contiguous almost throughout. However, at several places it is extremely thin and degraded, and in between there are several relatively good blocks. These can function as potential stepping-stones on the landscape between the Tiger Reserves.</p> <p>The corridor is a part of intact forest patch between Kanha-Phen-Achanakmar, however the State Government uses it for commercial forestry activities. It was important that these activities do not undermine the functionalities of this habitat as a wildlife corridor. The PCCF/ Wildlife did not take adequate action to manage these areas under meta-population.</p> <p>The Field Director, Kanha Tiger Reserve stated that the Kanha Management is perfectly aware of the philosophy of corridor connectivity and its conservation value and accordingly identified the aforesaid three ecological corridors. However, there is now a lateral thinking among the higher-ups that as most areas along the corridors fall under the jurisdiction of forest divisions outside the Kanha Tiger Reserve, it would be appropriate to have these plans prepared at the headquarter level in order to overcome difficulties relating to the jurisdiction. The fact remains that the Field Director neither initiated any steps to develop such corridors nor had he submitted any proposal to the higher authorities for its implementation.</p>
2	<p>Pench-Satpura-Melghat</p> <p>The Pench-Satpura corridor should receive the same level of 'safeguards' against industrial use as do core areas of both tiger reserves. This corridor is being lost/ fragmented due to habitations and development projects especially due to extension of coal mining blocks.</p> <p>Pench and Satpura Tiger Reserves in Central Indian Landscape are separated by an aerial distance of about 150 kilometres. The Pench-Satpura wildlife corridor is a forested corridor that links the contiguous Pench Tiger Reserve and Satpura Tiger Reserve. The corridor is direct, almost perfectly aligned along the shortest distance between the reserves and for most parts, heavily forested. The minimum width of the corridor identified by the Wildlife Institute of India is about three kilometer. There are evidences of resident tigers occupying the area. Leopard signs are available in most of the corridor area. The habitat in Pench- Satpura corridor has become fragmented at many places due to many developmental activities like coal mining, roads and railways¹.</p> <p>Indicative plan had been prepared for the management of Pench-Satpura as well as for Kanha-Pench corridors in Pench Tiger Reserve. The Field Director, Pench Tiger Reserve stated that management of the corridors was being done by the respective Forest divisions as per the working plans/ management plan under which the jurisdiction of the area falls. The Field Director Satpura Tiger Reserve also reiterated this.</p>

¹ Indicative plan for Pench- Satpura corridor.

Sl. No.	Status of management of various Corridors
	Replies indicated that management of corridor is not being adequately done in the interest of wildlife conservation.
3	<p>Ranthambore-Kuno-Madhav</p> <p>Kuno National Park is connected to the Ranthambore National Park and Kailadevi Wildlife Sanctuary (both part of the Ranthambore Tiger Reserve) through good forest patches towards the north western boundary from across the river Chambal (Jhala et al.2008), is located in the Sheopur district. Two Tigers viz. T-30 and T-38 dispersed from Ranthambore Tiger Reserve and finally reached Kuno-Palpur Sanctuary². Similarly, nine other tigers were found to be dispersed from Ranthambore Tiger Reserve and travelled in the district of Uttar Pradesh, Rajasthan and Madhya Pradesh. It was further noted that wildlife corridors with Panna Tiger Reserve and Ranthambore Tiger Reserve although mentioned in the Management Plan of Madhav National Park, but were not analysed and planned for gene flow and dispersal of wildlife.</p> <p>The Director, Kuno National Park did not identify and prioritise degraded habitats outside Protected Area. No indicative plan for corridor amongst the other Protected Areas within and outside the State was prepared to hold the relatively potential good tiger number as meta-population, despite ideally located close to the Ranthambore Tiger Reserve. According to Management Plan³ of Madhav National Park, the National Park is part of the landscape where tigers were the dominant species not very long ago. Some of the largest tigers in the world have been shot around Shivpuri and Gwalior. The National Park is situated in the middle of the landscape that connects Panna Tiger Reserve and Ranthambore Tiger Reserve, both situated in the dry tropics. The Director, Madhav National Park stated that identification of corridor was not done. Thus, not conducting of any identification indicates failure of the Director to conceive any corridor plan in a holistic manner.</p>
4	<p>Bandhavgarh-Sanjay-Dubri-Guru Ghasidas</p> <p>Sanjay-Dubri Tiger Reserve has five important external corridors that connect the Tiger Reserve to other Protected Areas/ Forests as depicted in the following picture. Out of the five corridors, three have been delineated by the Wildlife Institute of India and the fourth has been identified by the Working Plan of Shahdol Division. The fifth corridor lies in the Singrauli district and is primarily used by the elephants.</p> <p>Corridor I - lies in North Shahdol Forest Division, between Panpatha Wildlife Sanctuary of Bandhavgarh and Dubri Wildlife Sanctuary of Sanjay-Dubri Tiger Reserve. This corridor was frequently used by tigers and other wild animals to cross over from Bandhavgarh to Sanjay Dubri Tiger Reserve prior to the raising of the height of the Ban Sagar dam. In 2006, the height of the dam was increased thereby increasing the level of the water in the river which makes it difficult for the tigers and other wildlife to cross over to the other side thereby closing a channel for exchange of gene pool. A large part of the area has been notified as buffer of the two Reserves.</p> <p>Corridor II - Connects the Panpatha Wildlife Sanctuary of Bandhavgarh and Dubri Wildlife Sanctuary of Sanjay Tiger Reserve south of the first corridor. This is actually a viable corridor, although there is significant amount of fragmentation in this corridor due to presence of villages. There is evidence of tiger movement in the area as exemplified by cattle kills and other indirect signs, besides some direct sightings.</p> <p>Corridor III - Sanjay-Dubri Tiger Reserve shares a 53 kilometer long common boundary with Guru Ghasidas National Park, which was part of erstwhile Sanjay National Park. The tigers of the Tiger Reserve had been often seen crossing over and coming back in the recent past.</p> <p>Corridor IV - Connects Bandhavgarh Tiger Reserve with Guru Ghasidas National Park in Chhattisgarh through the Shahdol district and Korla and Manendragarh districts in Chhattisgarh.</p> <p>Corridor V - Wild Elephants from Chhattisgarh first came to the Reserve in October 2002. Since then, the movement of wild elephants was confined to the forests in Sidhi and Singrauli districts. These Elephants, as per the local information, come from Tamoringla Sanctuary which has a good population of wild elephants to Guru Ghasidas. From Guru Ghasidas, they enter the Mohan range of the core of Sanjay-Dubri Tiger Reserve, proceed to Sarai Range of Singrauli Forest Division where they stay for some time and</p>

² In an article published in the Cat News, a component of the Species Survival Commission of the International Union for Conservation of Nature on the trend of dispersal of tigers in the North-West India, 2015.

³ Chapter 11 of the Management Plan of Madhav National Park.

Sl. No.	Status of management of various Corridors
	<p>then return back to Chhattisgarh via the same route. Due to fragmentation of corridors, two wild elephants were electrocuted⁴ in February 2015.</p>  <p>Map 1: Adjoining areas (Corridors) of Sanjay-Dubri Tiger Reserve</p> <p>The Field Director, Sanjay Tiger Reserve submitted a proposal to the PCCF/ Wildlife in August 2017 on study on Habitat improvement: Corridor connectivity of elephants with objectives to study the resources availability of elephants in Sanjay Tiger Reserve, to map the movement of elephants in Sanjay Tiger Reserve and suggest measures for improving corridor connectivity, to formulate habitat improvement programme for elephants in Sanjay Tiger Reserve and to develop a long term monitoring plan and formulate management guidelines for viability of transient elephant population.</p> <p>The context of this proposal was reporting of elephants in Madhya Pradesh in 2002, which entered from Guru Ghasidas National Park and reached Mohan Range in Sanjay Tiger Reserve. Elephants visited in the Tiger Reserve in 2002 to 2009 and 2013 and again in 2017. Number of visiting elephants were seven in February 2017. However, no further progress about the study was available in records as well as work done to develop the corridor. The major threat to habitat linkages in this landscape is fragmentation due to railway lines, roads mining activities and other large-scale projects namely cement plants and thermal power plants. The second potential threat is biotic pressures and poaching of prey-base and probably tigers. The importance of this linkage cannot be undermined as towards the east, a large habitat still exists but can only be recolonised by tigers, if connectivity with Bandhavgarh remains intact.</p> <p>Bandhavgarh-Sanjay-Dubri-Guru Ghasidas corridor holds a promise for long term tiger conservation but only if this connectivity remains functional. The absence of any plan for the maintenance of the said five important corridors was not in accordance with the provisions for conservation and promotion of wildlife to secure their movement.</p> <p>The Field Director, Sanjay Tiger Reserve stated that the planning for corridor would be done in future with the direction of the PCCF/ Wildlife. Regarding the study on elephant corridor, the Field Director stated that approval for the proposal of Study is awaited (November 2019).</p>
5	<p>Bandhavgarh-Achanakmar</p> <p>Bandhavgarh-Achanakmar corridor connects two very important sub-landscapes, the Kanha-Pench population with Bandhavgarh-Sanjay-Dubri populations. However, the corridor passes through tiger hostile landscape since some communities living in the vicinity are known for their poaching tendencies. The habitat through which the corridor passes is itself narrow ridge-top forest with high biotic pressures. Further, due to availability of coal in this landscape matrix there is ever present pressure from infrastructure development associated with coal mining. This corridor requires serious attention for restoration in terms of ecology as well as socio-economic inputs. Its source population is Bandhavgarh Tiger Reserve.</p> <p>However, even indicative plan for this corridor was not approved. The Field Director stated that these areas are being maintained by respective territorial divisions as per provision of Working Plans.</p>

(Source: Forest Department)

⁴ At Baghwari village about six kilometer from Sidhi district headquarters when elephants strayed from the herd, lost the direction and entered Sidhi district.

Appendix 2.2

(Reference: Paragraph 2.2.4)

Shortcomings in preparation of Management Plan, impacts and good practices

Sl. No.	Protected Area	Period	Guidelines followed	Shortcomings	Impacts	Good Practices
1	Ratapani Wildlife Sanctuary	2008-09 to 2017-18	Not mentioned	<ul style="list-style-type: none"> • Research activities not identified. • Management Zone planning not done. • Schedule of Operations for financial activities not prescribed. • Detailed plan for patrolling by officials and their monitoring by superiors were not prescribed. 	<ul style="list-style-type: none"> • Better understanding of nature and its functions to enable sustainable utilisation of its resources could not be developed, conservation status of species and habitats and the extent of impact of conservation endeavours undertaken could not be known. • Planning through separation of functions in different determinate areas of a Protected Area was not done. • Management actions under the plan could not be ordered in a series of annual tasks. • Security measures for wildlife and their habitats could not be optimised through the Planning process. 	<ul style="list-style-type: none"> • Management Plan prepared in Hindi for better understating of various level of work force.
2	Bagadara Wildlife Sanctuary	2017-18 to 2026-27	A Guide for Planning Wildlife Management by Wildlife Institute of India	<ul style="list-style-type: none"> • Mechanism for Coordination, joint patrolling and intelligence gathering with neighbouring state of Utter Pradesh not prescribed despite evident threats discussed in the Management Plan itself. • Anti-poaching prescription were rather sketchy as detailed plan for patrolling and inspections by officials and their monitoring was not prescribed. 	<ul style="list-style-type: none"> • Security measures for wildlife and their habitats could not be optimised through the Planning process. 	<ul style="list-style-type: none"> • Ecology and salient feature of various inhabiting wild animal of the Sanctuary given. • Schedule of Operations for financial activities prescribed.
3	Kuno National Park	2010-11 to 2019-20	A Guide for Planning Wildlife Management by	<ul style="list-style-type: none"> • Assessment of wildlife not given. • Research activities not identified. 	<ul style="list-style-type: none"> • Better understanding of nature and its functions to enable sustainable utilisation of its resources could not be developed and conservation status of species and habitats 	<ul style="list-style-type: none"> • Management Plan prepared in Hindi and summary of Plan is given in English.

Sl. No.	Protected Area	Period	Guidelines followed	Shortcomings	Impacts	Good Practices
			Wildlife Institute of India and Working Plan Code	<ul style="list-style-type: none"> • Schedule of Operations for financial activities not prescribed. • Detailed plan for patrolling and inspections by officials and their monitoring was not prescribed. 	<p>and the extent of impact of conservation endeavours undertaken could not be known.</p> <ul style="list-style-type: none"> • Management actions under the plan could not be ordered in a series of annual tasks. • Security measures for wildlife and their habitats could not be optimised through the Planning process. 	<ul style="list-style-type: none"> • Alternative plan for Lion re-introduction in the Wildlife Sanctuary by establishment of breeding centres of genetically pure Lions brought from Zoos and rehabilitation of third/ fourth generation cubs in wild for Lion reintroduction in the National Park.
4	Nauradehi Wildlife Sanctuary	2007-08 to 2016-17	A Guide for Planning Wildlife Management by Wildlife Institute of India	<ul style="list-style-type: none"> • Tiger corridors were not analysed and mentioned despite evident corridor with Panna Tiger Reserve. • Number of villages shown in Management Plan was 69 while in a letter addressed to Chief Conservator of Forests, The Divisional Forest Officer stated that 74 villages are situated inside the Wildlife Sanctuary. Thus, there was discrepancy in significant base line data. • Issue of Wildlife Health and Insect attack discussed in 'Present Management' chapter. However, mitigation plan was not prescribed in relevant chapter. • Mitigation measures for degradation of habitats due to human interference were also not prescribed despite presence of number of villages in and around the Wildlife Sanctuary. 	<ul style="list-style-type: none"> • Conservation activities for the tiger landscape could not be planned and implemented. • Inadequate village relocation plan. • Lack of conservation measures for wildlife health and planning against insect attack. • Security measures for wildlife and their habitats could not be optimised through the Planning process. 	-----

Sl. No.	Protected Area	Period	Guidelines followed	Shortcomings	Impacts	Good Practices
				<ul style="list-style-type: none"> Detailed plan for patrolling and their monitoring was not prescribed. 		
5	Madhav National Park	2007-08 to 2016-17	Not mentioned	<ul style="list-style-type: none"> Research activities not identified. Existing Tiger corridor between Ranthambore was not delineated in the Management Plan. Man-animal conflict not analysed and mitigation not planned. Detailed plan for patrolling and their monitoring was not prescribed. 	<ul style="list-style-type: none"> Better understanding of nature and its functions to enable sustainable utilisation of its resources was not developed and conservation status of species and habitats and the extent of impact of conservation endeavours undertaken could not be known. Conservation activities for the tiger landscape could not be planned and implemented. Security measures for wildlife and their habitats could not be optimised by the Planning process. 	<ul style="list-style-type: none"> Schedule of operations for financial activities prescribed. Biodiversity (Mammals, Reptiles, Snails, butterflies, Amphibians etc.) of National Park was given.
6	Karera Wildlife Sanctuary	2008-09 to 2017-18	Not mentioned	<ul style="list-style-type: none"> Detailed plan for patrolling and inspections by officials and their monitoring was not prescribed. Government Revenue Land in 11 villages which was to be developed as core habitat of Great Indian Bustard, stated to have been identified but not listed in the Management Plan. 	<ul style="list-style-type: none"> Security measures for wildlife and their habitats could not be optimised through the Planning process. Great Indian Bustard habitat could not be developed and plan for re-introduction of Great Indian Bustard could not be implemented. 	<ul style="list-style-type: none"> Management Plan prepared in Hindi. Name and estimated number of Migratory birds seen in Dihaila Wetland in the Sanctuary was mentioned.

(Source: Forest Department)

Appendix 3.1

(Reference: Paragraph 3.3.1.2)

Deficiencies in retrofitting measures in road passing through Tiger Reserve/ Protected Areas

Sl. No.	Name of Tiger Reserve/ Protected Area	Name of Major Roads	Status of road	Status of retrofitting measures					
				Night traffic ban	Speed-breakers	Signage	Speed limit	Underpass/ Overpass	Modification in Bridges, Culverts, etc.
1	Pench Tiger Reserve	National Highway-7 (New National Highway - 44),	Upgraded	Not done	Not done	Done	Not done	Done	Not Applicable
		State Highway - 54	Existing	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not done
2	Panna Tiger Reserve	National Highway - 75	Existing	Not done	Done	Done	Not done	Not Applicable	Not done
		State Highway - 45	Existing	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not done
3	Sanjay Tiger Reserve	Bastua to Barkadol	Upgraded	Not done	Not done	Not done	Not done	Not done	Not Applicable
		Deomath to Kharbar	Upgraded	Not done	Not done	Not done	Not done	Not done	Not Applicable
		Ramgarh to Baheradol	Upgraded	Not done	Not done	Not done	Not done	Not done	Not Applicable
		Joori Runda to Bhadora	Upgraded	Not done	Not done	Not done	Not done	Not done	Not Applicable
4	Nauradehi Wildlife Sanctuary	National Highway - 12	Existing	Not done	Done	Done	Not done	Not Applicable	Not Applicable
		State Highway - 15	Upgraded	Not done	Done	Done	Not done	Not done	Not Applicable
5	Madhav National Park	National Highway -3	Upgraded	Not done	Done	Done	Not done	Not done	Not Applicable
		National Highway - 25	Existing	Not done	Not done	Not done	Not done	Not Applicable	Not done
6	Bandhavgarh Tiger Reserve	Amarpatan-Shahpura	Existing	Not done	Done	Done	Not done	Not Applicable	Not done
		Satna-Maihar-Parasi	Existing	Not done	Done	Done	Not done	Not Applicable	Not done
		Karkeli-Manpur	Existing	Not done	Done	Done	Not done	Not Applicable	Not done
		Amarpatan-Tala-Shahpura	Existing	Not done	Done	Done	Not done	Not Applicable	Not done

Sl. No.	Name of Tiger Reserve/ Protected Area	Name of Major Roads	Status of road	Status of retrofitting measures					
				Night traffic ban	Speed-breakers	Signage	Speed limit	Underpass/ Overpass	Modification in Bridges, Culverts, etc.
		Umariya – Majholi	Existing	Not done	Done	Done	Not done	Not Applicable	Not done
		Barahi-Singrauli	Existing	Not done	Done	Done	Not done	Not Applicable	Not done
7	Satpura Tiger Reserve	State Highway - 19	Existing	Not done	Not done	Done	Not done	Not Applicable	Not done
8	Kanha Tiger Reserve (Core)	State Highway - 26	Existing	Done	Done	Done	Done	Not Applicable	Not Applicable
9	Kanha Tiger Reserve (Buffer)	National Highway - 12A	Existing	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not done
10	Ratapani Wildlife Sanctuary	National Highway - 69	Existing	Not done	Not done	Done	Not done	Not Applicable	Not done

(Source: Forest Department)

Appendix 3.2

(Reference: Paragraph 3.5.2.1)

Status of sanctioned, working strength and shortage of field officials in audited divisions as on March 2019

Name of unit		Range Officer	Deputy Ranger	Forester	Forest Guard	Total
Kanha Tiger Reserve (core)	Sanctioned	10	12	40	175	237
	Working	7	5	18	165	195
Shortage per cent		30	58	55	6	18
Van Vihar National Park	Sanctioned	6	3	10	43	62
	Working	4	1	8	42	55
Shortage per cent		33	67	20	2	11
Kuno National Park	Sanctioned	10	12	45	225	292
	Working	8	4	22	154	188
Shortage per cent		20	67	51	32	36
Obedullaganj Division	Sanctioned	15	16	52	208	291
	Working	9	8	44	165	226
Shortage per cent		40	50	15	21	22
Panna Tiger Reserve	Sanctioned	14	16	67	174	271
	Working	9	11	31	137	188
Shortage per cent		36	31	54	21	31
Sanjay Tiger Reserve	Sanctioned	18	11	38	131	198
	Working	10	2	21	122	155
Shortage per cent		44	82	45	7	22
Nauradehi Wildlife Sanctuary	Sanctioned	9	12	36	122	179
	Working	5	3	24	110	142
Shortage per cent		44	75	33	10	21
Pench Tiger Reserve	Sanctioned	15	15	51	170	251
	Working	8	12	37	139	196
Shortage per cent		47	20	27	18	22
Satpura Tiger Reserve	Sanctioned	19	25	81	235	360
	Working	10	14	53	190	267
Shortage per cent		47	44	35	19	26
Kheoni Wildlife Sanctuary	Sanctioned	02	01	2	17	22
	Working	01	01	6	23	31
Shortage per cent		50	00	00	00	00
Kanha Tiger Reserve (Buffer)	Sanctioned	6	12	21	67	106
	Working	5	3	10	64	82
Shortage per cent		17	75	52	4	23
Bandhavgarh Tiger Reserve	Sanctioned	14	16	44	195	269
	Working	7	6	32	171	216
Shortage per cent		29	63	25	12	20
Madhav National Park	Sanctioned	8	8	15	70	101
	Working	3	4	13	63	83
Shortage per cent		63	50	13	10	18
Total	Sanctioned	146	159	502	1832	2639
Total	Working	86	76	319	1545	2026
	Shortage	60	83	183	287	613
	Per cent	41	52	36	16	23

(Source: Forest Department)

Appendix 3.3

(Reference: Paragraph 3.5.2.1)

Division wise Sanctioned, Working Strength and Forest Guards per square kilometre

Sl. No.	Division	Area (square kilometre)	Strength		Area per Forest Guard (square kilometre)		Forest Guard per square kilometre	
			Sanctioned	Working	Sanctioned Posts	Working Posts	Sanctioned	Working
1	Van Vihar National Park	4.45	43	42	0.10	0.11	9.66	9.44
2	Kuno National Park	1235.39	158	120	7.82	10.29	0.13	0.10
3	Kanha Tiger Reserve (Core)	1050.74	175	165	6.01	6.37	0.17	0.16
4	Pench Tiger Reserve	1179.63	170	139	6.94	8.49	0.14	0.12
5	Madhav National Park	577.44	70	56	8.25	10.31	0.12	0.10
6	Obedullaganj Division	1797.91	208	165	8.64	10.90	0.12	0.09
7	Nauradehi Division	1197.04	122	106	9.81	11.29	0.10	0.09
8	Panna Tiger Reserve	1688.35	174	137	9.70	12.32	0.10	0.08
9	Sanjay Tiger Reserve	2376.46	131	122	18.14	19.48	0.06	0.05
10	Bandhavgarh Tiger Reserve	1536.94	195	171	7.88	8.99	0.13	0.11
11	Satpura Tiger Reserve	2133.30	235	190	9.08	11.23	0.11	0.09
12	Kanha Tiger Reserve (Buffer)	1134.31	67	64	16.93	17.72	0.06	0.06
13	Kheoni Wildlife Sanctuary	132.78	17	26	7.81	5.11	0.13	0.20
Total		16044.73	1765	1503	9.09	10.68	0.11	0.09

(Source: Forest Department)

Appendix 3.4

(Reference: Paragraph 3.5.3)

Statement showing status of availability of amenities in Patrolling Camps

Sl. No.	Division	No of Camps visited	Torch/Battery	Arms	Tiger Tracer	Measurement Tape	First Aid Kit	Toilet Facility
1	Pench Tiger Reserve	20	19	0	15	18	19	14
2	Sanjay Tiger Reserve	9	7	1	6	7	1	4
3	Kanha Tiger Reserve (Core)	14	12	0	14	11	14	14
4	Panna Tiger Reserve	20	7	0	12	16	14	11
5	Madhav National Park	4	2	0	3	2	0	3
6	Nauradehi Division	4	2	0	3	2	0	3
7	Kuno National Park	4	1	4	4	2	2	4
8	Obedullaganj Division	4	2	4	3	3	0	0
9	Bandhavgarh Tiger Reserve	16	15	0	13	14	15	7
10	Satpura Tiger Reserve	14	11	0	14	14	14	12
11	Kanha Tiger Reserve (Buffer)	10	8	0	10	9	9	9
12	Kheoni Wildlife Sanctuary	2	2	0	1	2	0	1
Total		121	88	9	98	100	88	82
<i>Per cent</i>			73	7	81	83	73	68

(Source: Responses of field staff during joint inspection of Patrolling Camps)

Appendix 3.5

(Reference: Paragraph 3.5.3)

Statement showing responses of Camp labourers on welfare measures

Sl. No.	Division	No. of labourers	Prize System	Weekly Off	Health Check up	Delay in payment of wages	Water bottle	Mosquito net	Ration Facility
1	Kanha Tiger Reserve (Core)	14	3	13	12	5	7	10	12
2	Panna Tiger Reserve	20	5	19	17	7	11	8	8
3	Pench Tiger Reserve	20	7	19	18	0	19	19	19
4	Sanjay Tiger Reserve	9	5	7	4	2	4	6	0
5	Madhav National Park	3	0	1	0	0	0	1	Not Applicable
6	Nauradehi Division	3	0	1	0	0	0	1	Not Applicable
7	Kuno National Park	4	3	4	0	0	1	4	Not Applicable
8	Obedullaganj Division	4	0	2	0	3	0	0	Not Applicable
9	Bandhavgarh Tiger Reserve	16	8	15	12	8	10	15	9
10	Satpura Tiger Reserve	14	7	13	9	1	11	12	0
11	Kanha Tiger Reserve (Buffer)	10	4	2	10	10	4	1	1
12	Kheoni Wildlife Sanctuary (Dewas General Division)	2	0	0	0	1	0	0	Not Applicable
Total		119	42	96	82	37	67	77	49
Per cent			35	81	69	31	56	65	48

(Source: Responses of field staff during joint inspection of Patrolling Camps)

Appendix 3.6

(Reference: Paragraph 3.6.1)

Compensation paid by Forest Department in Human-Wildlife Conflict cases during 2014-19

(₹ in Crore)

Sl. No.	Year	Number of Cattle injured/ predated	Compensation paid	Injury and death of villagers in wildlife attack	Compensation paid
1	2014-15	2237	1.74	254	0.28
2	2015-16	3463	2.99	236	0.23
3	2016-17	3546	3.59	227	0.33
4	2017-18	4169	3.61	185	0.41
5	2018-19	4051	3.51	254	0.41
Total		17466	15.44	1156	1.66

(Source: Forest Divisions)

Appendix 4.1

(Reference: Paragraph 4.1)

Deficiency and delays in augmentation of Protected Areas and Tiger Reserves

Sl. No.	Proposed Protected Area/ Tiger Reserve	Deficiency and delays in augmentation of Protected Area and Tiger Reserve
1	Notification of Protected Areas under Indira Sagar Project	<p>Forest clearance granted by Ministry of Environment, Forest and Climate Change to Narmada Sagar Project also known as Indira Sagar Project approved in October 1987 for diversion of 41,111.97 hectares of forest land in favour of Narmada Valley Development Authority. According to a condition that a committee constituted by the State Government for conservation and management of wildlife will decide necessary steps to be taken and draw up a plan which will be implemented at the cost of the project. The State Government constituted a Committee in January 1988 mainly comprising of the Chief Wild Life Warden, the Director, Wildlife Institute of India and a nominated member of State Board for Wildlife for aforesaid purpose.</p> <p>Audit noted in office of the PCCF/ Wildlife that the issue went through number of processes since. Narmada Valley Development Authority awarded consultancy to two agencies to study the impacts of the Project on wildlife, plants and suggest mitigation measures. They submitted their reports in 1994 and 1996 and stated that the area harbours 32 mammalian species and has an abundant herbivore population, they suggested creation of one National Park and two Wildlife Sanctuaries in the area.</p> <p>Narmada Valley Development Authority submitted a revised proposal in November 2002 and proposed 491.552 square kilometre area for three Protected Areas. Another consultancy was given to State Forest Research Institute by Narmada Valley Development Authority in April 2004 which proposed constitution of one National Park, two Wildlife Sanctuaries and two Conservation Reserves. The proposal for notification of five Protected Areas comprising of 696.91 square kilometre area was submitted (May 2005) to Cabinet which was rejected on the ground that the large area is involved and this will restrict activities such as fishing, tourism and agriculture in areas and cause hardship to local people. Chief Wild Life Warden informed Audit in July 2019 that proposal for constitution of Omkareshwar National Park (246.44 square kilometre) and two Wildlife Sanctuaries (Singaji Wildlife Sanctuary 177.11 square kilometre and Mandhata Wildlife Sanctuary 68.75 square kilometre) and two Conservation Reserves (Narmada Conservation Reserve-1, 134.53 square kilometre and Narmada Conservation Reserve-2, 19.01 square kilometre) comprising a total area of 645.84 square kilometre has been sent (December 2007) to the State Government. There was no progress in the matter since.</p> <p>Thus, the condition of taking necessary steps for conservation and management of wildlife, stipulated by Ministry of Environment, Forest and Climate Change in diversion of huge forest land for non-forestry purposes in 1987, is still trapped in processes and could not be fulfilled by the State Government.</p>
2	Augmentation of Pench Tiger Reserve	<p>Size of core of Pench Tiger Reserve is only 411.30 square kilometre and buffer is only 768.30 square kilometre. Efforts of the Department were not visible in records to increase the area of core and buffer of Pench Tiger Reserve. Contiguous to the Pench Tiger Reserve of Madhya Pradesh is the Pench Tiger Reserve of Maharashtra. This provides another 257 square kilometre of inviolate habitat to tiger. It is obvious that the present legal boundary does not serve as ecological boundary for many species of fauna. To and fro movement from the adjoining Pench Tiger Reserve of Maharashtra and other forest areas is frequent.</p> <p>The Pench Tiger Reserves of Madhya Pradesh and Maharashtra together afford 668 square kilometre of inviolate space for tigers. In order to provide around 800-1000 square kilometre of inviolate habitat, it is necessary to include 227.55 square kilometre of Rukhad and Ari Range towards the east of the Pench Mowgli Wildlife Sanctuary. This track is almost free from human influence and only one village Sakata with small number of family exist within this area. This forest is a part of Pench-Kanha corridor and therefore its inclusion as part of the Critical Tiger Habitat in future will</p>

Sl. No.	Proposed Protected Area/ Tiger Reserve	Deficiency and delays in augmentation of Protected Area and Tiger Reserve
		<p>be great importance for tiger conservation. However, efforts of the Field Director were not visible to relocate Sakata village and augment the Core area for ensuring the long-term viability of tiger in the area.</p> <p>The Field Director stated that discussions with the villagers is under progress, action would be taken after obtaining their consent. Fact remains that even after more than 10 years since approval of Tiger Conservation Plan in 2008-09 the village could not be relocated and the area could not be added to the Pench Tiger Reserve for leveraging tiger and wildlife conservation.</p>
3	Notification of Ratapani Wildlife Sanctuary as Tiger Reserve	<p>National Tiger Conservation Authority had granted (August 2008) in-principle approval for notification of Ratapani Wildlife Sanctuary and other adjoining area as Tiger Reserve. 530.67 square kilometre area was notified as Ratapani Wildlife Sanctuary in 1976, area was further added in 1983 with a total notified area being 689.46 square kilometre. However, the actual area of the Wildlife Sanctuary was 910.638 square kilometre. Thus, there is a difference of 221.178 square kilometre between notified and actual area of the Wildlife Sanctuary.</p> <p>In view of above anomaly, a proposal of notification of 763.812 square kilometre as Core area and 480.706 square kilometre as buffer area for Ratapani Tiger Reserve was sent to the State Government in January 2012. Divisional Forest Officer, Obedullaganj stated (October 2019) that a revised proposal of 763.812 square kilometre as Core area and 480.706 square kilometre as buffer area (Total area of 1,244.518 square kilometre) of Ratapani Tiger Reserve was sent and the matter is under consideration of the State Government.</p>
4	Notification of Phen Wildlife Sanctuary as Tiger Reserve	<p>Similarly, as per Management Plan for the period 2011-12 to 2020-21 for the Phen Wildlife Sanctuary, the Kanha Management has proposed to declare it a Critical Tiger Habitat recognising its potential. Notified area of the Wildlife Sanctuary is about 111.704 square kilometre. As per this proposal, the Chief Wild Life Warden has also listed this area for further action and notification. One village falling in the Wildlife Sanctuary had already been relocated earlier for the purpose of notifying the area as Critical Tiger Habitat. The PCCF/ Wildlife sent a proposal of notifying Phen Wildlife Sanctuary as Tiger Reserve in March 2017. In response, the State Government, Forest Department sought copies of earlier notifications for Kanha National Park, Kanha Tiger Reserve Core and Buffer and Phen Wildlife Sanctuary from the PCCF in April 2017. The PCCF/ Wildlife wrote letters to the Field Director, Kanha Tiger Reserve in May 2017 and May 2019, the requisite documents were sent by the Field Director after two years in May 2019 only and the notification could not be made up to January 2020. This indicated lack of adequate attention towards augmentation of Tiger Reserves.</p> <p>The Field Director stated that the Management has been making efforts for the past two years to declare the area around Phen Wildlife Sanctuary as its buffer zone along with the Wildlife Sanctuary as a Critical Tiger Habitat of the Tiger Reserve. But in spite of so much effort and persuasion, villagers living around the Wildlife Sanctuary did not agree to the proposal of keeping their villages under buffer zone. Therefore, the Kanha Management has no option but to propose the Phen Wildlife Sanctuary as a Critical Tiger Habitat without a buffer. Presently, the office is going ahead with this proposal to be sent to the higher office very soon.</p>

(Source: Forest Department)

Appendix 4.2
(Reference: Paragraph 4.3)
Status of relocation in audited divisions

Sl. No.	Name of Protected Area	Proposed for relocation		Relocation completed		Remaining relocation	
		Revenue Villages	Forest Villages	Revenue Villages	Forest Villages	Revenue Villages	Forest Villages
National Parks							
1	Panna	19	0	17	0	2	0
2	Pench	8	0	8	0	0	0
3	Kanha	2	33	2	33	0	0
4	Sanjay	21	0	9	0	12	0
5	Bandhavgarh	6	3	4	2	2	1
6	Satpura	7	1	5	1	2	0
7	Madhav	10	0	10	0	0	0
8	Kuno	24	0	24	0	0	0
9	Van Vihar	0	0	0	0	0	0
Total		97	37	79	36	18	1
Wildlife Sanctuaries							
10	Phen	0	1	0	1	0	0
11	Gangau	2	0	2	0	0	0
12	Sanjay Dubri	24	0	2	0	22	0
13	Ratapani	6	3	2	0	4	3
14	Singhori	0	0	0	0	0	0
15	Nauradehi	12	1	9	1	3	0
16	Bori	1	16	0	15	1	1
17	Pachmarhi	16	7	11	7	5	0
18	Kheoni	0	1	0	1	0	0
19	Panpatha	8	0	1	0	7	0
20	Son Gharial	0	0	0	0	0	0
21	Karera	0	0	0	0	0	0
22	Pench Mowgli	0	0	0	0	0	0
23	Bagdara	0	0	0	0	0	0
24	Ken Gharial	0	0	0	0	0	0
Total		69	29	27	25	42	4
25	Kanha Tiger Reserve Buffer	0	2	0	2	0	0
26	Satpura Tiger Reserve Buffer	4	0	4	0	0	0
27	Panna Tiger Reserve Buffer	1	0	1	0	0	0
Total		5	2	5	2	0	0
Grand Total		171	68	111	63	60	5

(Source: PCCF/ Wildlife)

Appendix 4.3

(Reference: Paragraph 4.5)

Deficiencies in management of water bodies

Sl. No.	Protected Area	Deficiency in management of water bodies
1	Madhav National Park	<p>Impact of Change in water course to Sakhya Sagar lake due to construction of Sewage Treatment Plant</p> <p>As per the Management Plan of Madhav National Park, drainage system of Shivpuri city was planned in such a way that most of the sewage from the town flows in to the Jadhav Sagar tank which acts as a settling tank and the decant then overflows through a series of weirs into the Sakhya Sagar Lake (Chandpatha Lake). Jadhav Sagar is one of the main sources of water during the summer season.</p> <p>As per the comprehensive Environment Impact Assessment study on Reinforced Cement Concrete pipe line work for Sewage Treatment Plan facility, Shivpuri has three Lakes namely Jadhav Sagar Lake, Chandpatha Lake and Madhav Sagar Lake, which are connected through a stream in a series in the same order. The Jadhav Sagar Lake is in a deteriorated condition because of the ingress of sewerage through the nallas channelled into the lake. As per the project proposal, the effluent from this plant will be suitable for drinking purpose for wild life and will be discharged in Barhi river through Ghasari Nala.</p> <p>Thus, after start of the functioning of Sewage Treatment Plant, water from the Jadhav Sagar will no longer be flowing to the Chandpatha Lake and may be affecting water level of the lake specially in summer as this was the main source of water for the Chandpatha lake. It was observed that the Environment Impact Assessment study has not considered this aspect and the department had also not analysed Impact of Change in water course to Sakhya Sagar due to Sewage Treatment Plan. Ministry of Environment, Forest and Climate Change has granted the first phase permission to the project in April 2018. Construction of Sewage Treatment Plant was in progress (December 2019).</p> <p>Further, as per the paragraph 6.8.4 of Management Plan of Madhav National Park, the nullah carrying all waste of Shivpuri town drains into Sakhya Sagar (Chandpatha Lake), leading to slow eutrophication.</p> <p>Audit observed in Joint Inspection that the flow of hazardous Sewage water of Jadhav sagar lake through Karbala area was polluting the Chandpatha Lake. The status of water influx into the Chandpatha Lake is visible in pictures below:</p> <div data-bbox="459 1332 1458 1653" style="text-align: center;">  <p data-bbox="774 1624 1165 1653">Nala leading to Chandpatha Lake</p> </div> <p>(Source: Picture taken during Joint Inspection)</p> <p>Neither the Director nor the Committee for monitoring Eco-Sensitive Zone took any action to divert the water influx to the Chandpatha Lake, which was hazardous to wildlife of the National Park. Not even a single meeting of the Monitoring committee was held for any purpose, thus the committee under Eco-Sensitive Zone notification was evidently in defunct state.</p> <p>The Director stated that pipeline was being laid through old Shivpuri Jhansi road. The Sewage Treatment Plant is to be constructed outside the National Park. After treatment of the sewage water, it would be released in Barhi river situated in the National Park and only rain water would reach in the Sankhya Sagar lake. The Department did not conduct any study about the scarcity of water in the lake as a result of this. Fact remains that due to changing</p>

Sl. No.	Protected Area	Deficiency in management of water bodies
		course of water flow through Sewage Treatment Plant project, main water source of Sankhya Sager lake will flow to down below in Barhi River impacting water source to the lake and aquatic habitat.
2	Karera Wildlife Sanctuary	<p>Conservation of wetland in Karera Sanctuary</p> <p>As per Management Plan of the Wildlife Sanctuary for 2008-09 to 2017-18, Dihaila wetland in Karera Wildlife Sanctuary is a 493.93 hectare area, comprising of revenue and private land, which was a great attraction of migratory birds such as Cormorants, Herons, Egret and Stork in winter season. 25 to 59 species of migratory birds were seen in winters during 2000-01 to 2004-05. These birds stopped migrating to the wetlands due to irrigation from the water, and cultivation of Rabi crop in the wetland. The Management Plan prescribed acquisition of land and development for eco-tourism. However, the prescribed measures were not implemented. The Director stated that a proposal was sent to the Collector for acquisition of land in 1999, which was not approved.</p> <p>The Director stated that proposal for acquisition of land for wetland was sent to Addl. Chief Secretary, Forest in 1999 which was not approved. Reply indicated that affirmative action for habitat improvement in the wetland was not taken in this regard for more than 20 years.</p>
3	Nauradehi Wildlife Sanctuary	<p>Creation of watersheds in Nauradehi Wildlife Sanctuary</p> <p>Management Plan for Nauradehi Wildlife Sanctuary envisaged that no major marginal inputs in the form of large-scale habitat manipulations are needed, nor would they be allowed in the core zone. Small <i>Jhiryas</i>, those which remain alive throughout the year should be kept in good condition and cleaned to the desired extent. The depth of water in open water bodies, tanks, stop dams, <i>Jhiryas</i> etc. should be recorded in the first week of every month, from January to June, which can be easily done by vertically fixing a pole at the deepest part of the pool.</p> <p>A track of water quality of open water holes should be kept to ensure safety of the users, especially the field staff, from water borne diseases. New artificial sources should be tried only after thorough examination of sub-strata of catchments, gradients, and soil profile. National Hydrological Institute, Sagar was doing water survey in the Wildlife Sanctuary. In future, sites can also be taken up based upon their survey.</p> <p>The Divisional Forest Officer, Nauradehi Wildlife Sanctuary informed Audit that only 96 water bodies were in existence. However, it was noted that during 2010 and 2017, 83 tanks, 498 percolation tanks, 13,358 cubic meter check dams, and 11,335 running meter contour trenches were created in 35 watersheds for improvement in water level in the area, but permit from the Chief Wild Life Warden was not obtained.</p> <p>The 35 selected water sheds sights were not taken on the basis of National Hydrological Institute, Sagar survey. The depth of water in open water bodies, tanks, stop dams, <i>Jhiryas</i> etc. was not recorded in the first week of every month from January to June. A track of water quality of open water holes, and the utility and quality of these water bodies was not ensured. Also, the impact due to creation of these water bodies in such a large extent was not assessed. Large scale habitat manipulations were not in consonance with the provisions of Management Plan and Wildlife (Protection) Act, 1972.</p> <p>The Divisional Forest Officer stated that work had been done on the guidelines given by the senior officers, and that, there were not any irregularity found in the work. The reply was not acceptable as the provisions of Management Plan was not followed while carrying out the soil and moisture work. It could not be made sure that the water regime of the Wildlife Sanctuary improved through the work carried out in the Wildlife Sanctuary.</p>

(Source: Forest Department)

Appendix 4.4

(Reference: Paragraph 4.8.1)

Ambiguities in functioning of Local Advisory Committee and regulation of commercial activities around the Tiger Reserves

Sl. No.	Division	Ambiguities noticed
1	Bandhavgarh Tiger Reserve	<p>The State Government constituted Local Advisory Committee for the Tiger Reserves of the State in February 2013 under the Guidelines. Nomination of the members of the Local Advisory Committee was done by the State Government in September 2013. Commissioner, Shahdol was the Chairman of the Local Advisory Committee while the Field Director, Bandhavgarh Tiger Reserve was the Member Secretary of the Committee. However, during 2014-19, instead of holding 10 meetings at least, only five meetings viz. 30 July 2014, 17 February 2016, 26 May 2017, 30 September 2017 and 16 February 2018 were held.</p> <p>Local Advisory Committee mainly discussed and decided on issues such as park entry fee, current booking, development of tourism in buffer area with the help of local community, encroachment in Buffer area, no objection for mining activities, Liquefied Petroleum Gas distribution, employment of local people in forestry/ eco-tourism/ development activities, night traffic prohibition in Dhamokhar-Tala Road, establishment of solid waste management plant.</p> <p>However, decision taken by Local Advisory Committee on LPG distribution out of tourism income in its 17 February 2016 meeting was neither implemented nor was reviewed in next Local Advisory Committee meeting. On 30 July 2014 meeting, the Chairman instructed to send a proposal for constitution of a Committee for eviction of encroachments in Tala village. It was noticed that compliance to the decision was not done.</p> <p>Further, the Local Advisory Committee decided night traffic prohibition in Tala-Dhamokhar Road, but was not implemented. The Local Advisory Committee not acted upon to; review the tourism strategy with respect to the tiger reserve and make recommendations to the State Government, ensure site specific norms on buildings, and infrastructures in areas inside and close to tiger reserves, advise local self-government and the State Government on issues relating to development of tourism in and around tiger reserves, monitor regularly activities of tour operators to ensure that they do not cause disturbance to animals while taking visitors into the tiger reserves, encourage tourism industry to augment employment opportunities for members of local communities. Thus, the objectives as envisaged in the Guidelines largely remained unachieved.</p> <p>The Field Director stated that the Local Advisory Committee decision on Liquid Petroleum Gas distribution from tourism income is been implemented in the selected patrolling camps. The implementation is subject to financial approval from the park development fund by a committee headed by the PCCF (Head of Forest Force). Therefore, the implementation will be done as per availability of funds. Refilling of distributed Liquid Petroleum Gas cylinder is also being done regularly. Further, heavy vehicular traffic has been banned at night on Tala-Dhamokhar Road. Local Advisory Committee has taken decision like increasing the numbers of tourist vehicles in the park to promote tourism industry which has given more employment opportunity for local communities.</p> <p>The reply was not acceptable because the constitution of a Committee for eviction of encroachments in Tala village not done, total night traffic in Tala-Dhamokhar Road not implemented. The management did not reply on the Local Advisory Committee not acted upon to; review the tourism strategy with respect to the tiger reserve and make recommendations to the State Government, ensure site specific norms on buildings, and infrastructures in areas inside and close to tiger reserves,</p>

Sl. No.	Division	Ambiguities noticed
		<p>advise local self-government and the State Government on issues relating to development of tourism in and around tiger reserves.</p> <p>It was noticed from minutes of meeting of local area committee dated 31 October 2019 that a proposal was discussed for establishment of solid waste management unit in Tala (tourist gate and facility area) and land had been identified. However, no objection certificate was to be obtained from Revenue Department as identified land was revenue land. Thus, there was no waste management unit was working in the Park indicating that the norms laid down were not fulfilled by the Department and the park could not be kept free from the waste.</p> <p>The Field Director stated that no objection certificate has been issued in Local Advisory Committee meeting January 2020 for land for a solid waste plant in Tala area. Thus, the solid waste management was not working in the Tiger Reserve during 2014-19.</p>
2	Pench Tiger Reserve	<p>Tiger Conservation Plan of Pench Tiger Reserve allowed activities which could be promoted, regulated or prohibited which included 26 items such as commercial mining, felling of trees, setting of saw mills and industries causing water, air, soil, noise pollution, establishment of hotels and resorts etc. Functioning of local area advisory committee formed by the State Government for Pench Tiger Reserve was not adequate as only two meetings were conducted during 2014-19 as against the minimum 10. It did not monitor implementation of its decisions. Local Advisory Committee did not monitor tourist activity around the Tiger Reserve, ownership of hotel/ resort, type of construction, detail of employed persons. It did not advise the State Government in any of the matter as was mandated.</p> <p>However, the Field Director informed that no activity has been identified for regulation. It was stated that regulation on commercial activities was not possible due to lack of legal provision in this regard.</p>
3	Panna Tiger Reserve	<p>The Local Advisory Committee was also formed in September 2013. Maintenance of records of Meetings of Local Advisory Committee and details of proceedings were not available. No meeting was found to be held between 2013 and 2017. However, three meetings were held after the re-constitution of the committee in the year 2017. Thus, only three meetings were held against envisaged minimum 10.</p> <p>Minutes of the meeting held in December 2017 revealed that it was also advised to discuss the matter of dumping the waste in areas in the Panna Tiger Reserve with the Panna Municipality. However, records pertaining to upcoming meetings of the committee showed that no action was taken to resolve these problems. The Field Director stated that Collector, Chattarpur has informed that treatment plant is being installed in Khajuraho. Thus, the matter of dumping of wastage by Panna Municipality remained unresolved.</p> <p>The PCCF/ Wildlife directed in June 2017 to all concerned through Local Advisory Committee about the types of fencing to be done in the vicinity of the Tiger Reserve and in the resorts, hotels and <i>dhabas</i> etc. However, no such steps were found to be taken in the proceeding of Local Advisory Committee meetings. Monitoring by Local Advisory Committee relating to environmental issues of all tourist facilities located in and around the Tiger Reserve, areas covered/ created, ownership, type of construction, details of number of employees/ people getting employment, etc. were not found in the related records. The records pertaining to investigation, regulation and compliance related to air and noise pollution of powered tourist vehicles were also not available. Thus, compliance by Local Advisory Committee on the matter could not be verified.</p>
4	Kanha Tiger Reserve	<p>The Local Advisory Committee was formed in September 2013 and only six meetings were held during 2014-19 as against minimum of 10, no meeting was held in 2018. In a meeting held in July 2015 the Local Advisory Committee decided to remove the fencing from hotels/ resorts/ buildings and other</p>

Sl. No.	Division	Ambiguities noticed
		<p>commercial infrastructures. Further, in July 2013 it was decided to undertake scientific study on impacts of tourism on wildlife of core as well as buffer area. However, no follow up of the decision was found to be taken in records.</p> <p>A research report published in 2015 highlighted that most of the hotels/ resorts of <i>Khatia</i> Gate of the Tiger Reserve are situated within half kilometre distance from the Banjar River restricts wildlife access to the river and has fragmented the critical wildlife corridor between Kanha and the Pench Tiger Reserves⁵. However, records did not show that the Local Advisory Committee did address this issue in its meetings.</p> <p>The Field Director stated that height of fencing from hotels/ resorts/ buildings and other commercial infrastructures have been reduced to one meter, a research by Wildlife Institute of India is under progress on impacts of tourism activities on wildlife which include this issue. Regarding tourist infrastructure near Banjar river, the Field Director stated that new construction has been restricted and these infrastructures do not cause hindrance to wild animal from going to river. However, records/ research findings were not produced in support of the reply and veracity of claim could not be verified. The reply was silent about a smaller number of Local Advisory Committee meetings during 2014-19.</p>
5	Satpura Tiger Reserve	<p>Nine meetings of the Local Advisory Committee were held in Satpura Tiger Reserve, but compliance reports to the meeting had not been received from members of other departments. This indicated poor monitoring by the committee of the commercial activities in and around the Tiger Reserve. The Management did not take any action to ensure that the waste generated by the hotels/ restaurants in and around the tiger reserve are recycled and/ or treated before discharge. New infrastructures which came/ coming up around the reserve were not mandated to obtain clearance from the Local Advisory Committee and hence conformity to the proper norms of waste management, construction rules etc. was not ensured.</p> <p>Further, the Field Director coordinated with Special Area Development Authority and Pachmarhi Cantonment Board in June 2020 but it could not be ensured that all the solid waste, sewage is treated before it is released into the surrounding environment in Pachmarhi area. Further, no action was taken regarding infrastructure in other tourism areas of Churna and Madhai.</p>

(Source: Forest Department)

⁵ Kumar Sambhav Shrivastava.

Appendix 4.5

(Reference: Paragraph 4.8.2.1)

Status of encroachment as informed by audited Divisions

Sl. No.	Division/ Protected Area	Encroachment (Hectares)
1	Kanha Tiger Reserve (Core)	0
2	Kanha Tiger Reserve (Buffer)	0
3	Panna Tiger Reserve	1795.631
4	Nauradehi Wildlife Sanctuary	467.121
5	Kuno National Park	2486.45
6	Madhav National Park	7.84
7	Van Vihar National Park	0
8	Obedullaganj Division	983.698
9	Pench Tiger Reserve	0
10	Sanjay Tiger Reserve	475.376
11	Bandhavgarh Tiger Reserve	722.79
12	Satpura Tiger Reserve	0
13	Kheoni Wildlife Sanctuary	4.00
Total		6942.906

(Source: Forest Department)

Appendix 4.6

(Reference: Paragraph 4.8.2.1)

Discrepancy/ deficiency in cases of encroachments

Sl. No.	Division	Discrepancy/ deficiency noticed
1	Kanha (Buffer) Tiger Reserve	The Field Director, Kanha (Buffer) informed encroachment cases as 'nil' and stated that all the encroachments had been evicted up to 2003-04. However, Audit noted that in March 2017, the PCCF (Head of Forest Force) directed to evict the encroachment in 3,413.210 hectares forest land from (Buffer) Tiger Reserve. Thus, the management was not aware about the encroachments which undermined the process of its eviction.
2	Pench Tiger Reserve	As per the Tiger Conservation Plan of Buffer area of Pench Tiger Reserve, 660.80 hectares in 75 cases land was being used for non-forestry purposes. Detail regarding actual land use in these cases and current status thereto was not available with the Managers. Further, 18,988 hectares area was under encroachment in 62 cases noticed prior to year 2000. Still the Field Director did not inform these cases as encroachments. The Field Director stated that these would be examined and action would be taken accordingly. Thus, due to evident unawareness about the cases, eviction plan could not be planned and implemented by the Field Director.
3	Sanjay Tiger Reserve	The Field Director, Sanjay Tiger Reserve informed encroachments in 475.376 hectares forest land in 172 cases to the Chief Conservator of Forests, Rewa in September 2019 and eviction was reported as 'nil'. Records relating to year wise encroachment cases were not maintained in Division, the Field Director earlier informed to the Chief Conservator of Forest, Rewa that as on March 2017, 622 encroachers had encroached 854.08 hectares forest land. Thus, there was discrepancy in reporting of encroachment cases. Further, Action plan for eviction of encroachments and documents relating to any legal process was not found in records. The Field Director stated that notices had been issued to 622 encroachers for eviction of 854.08 hectares land in Bagdara Wildlife Sanctuary, directions would be issued in the matters to the officers for immediate disposal of cases as per departmental instructions. The delay in disposal of cases was attributed to shortage of staff. The fact remains that the actual position of encroachment cases is not available with Management, as different figures were reported to higher authorities and records were not maintained to monitor the cases.
4	Satpura Tiger Reserve	The Field Director, informed encroachment cases as 'nil'. However, Audit noted that in March 2017, the PCCF directed to evict the encroachment in 1,332.126 hectares forest land from the Tiger Reserve. The Field Director stated that information would be sought and reconciliation would be done. Thus, the management was unaware about the encroachments which undermined the process of its eviction.
5	Nauradehi Wildlife Sanctuary	As per the Management Plan of the Wildlife Sanctuary for 2007-08 to 2016-17, a total of 334.34 hectares area was under encroachment in the Division, while a total of 467.121 hectares of forest land was under encroachment in the Division in 316 cases as on December 2018 after grant of forest rights in 59.186 hectares of forest land in 63 cases under Forest Rights Act, 2006. The new encroachment of 191.945 hectare in the Wildlife Sanctuary after 2007-08 indicated serious deficiencies towards habitat management. Records were not maintained by the Divisional Forest Officer to show year-wise detail of encroachment cases. The Divisional Forest Officer stated that action would be taken for eviction of the encroachments.
6	Madhav National Park	The Range Officer/ South noted in March 2019 that a Cafeteria was being operated in compartment no. 54 of the National Park near <i>Bhadaiya kund</i> without the permission of the Park authority. No legal action for eviction or filing case was taken against the offender. The Director stated that no permission was granted by the Management and action has not been taken yet to register the case by the Range officer (South) as tendering process was done by the Sub Divisional Magistrate, Shivpuri on behalf of District Tourism Promotion Council, Shivpuri. Information regarding the construction is being obtained and legal action will be taken. Reply is not in consonance with the legal provision and the Management had failed to initiate action for eviction of the encroachment as well as other lawful proceedings. This Cafeteria is located on the bank of the Sankhya Sagar Lake which may be hazardous to protection and conservation to aquatic wildlife in the Lake.

(Source: Forest Department)

Appendix 4.7

(Reference: Paragraph 4.9.1)

Deficiency and adverse impacts of other major projects on wildlife habitats

Sl. No.	Project	Deficiency and adverse impacts on wildlife habitats
1	Machagora dam on upstream of Totladoh dam in Pench Tiger Reserve	<p>Construction of dams impacts biodiversity of upstream and downstream as discussed below⁶:</p> <p>Upstream effects: Construction of a dam generally means that areas upstream of the dam are flooded and are permanently put under water. In some cases, attempts have been made to move large animals when the reservoir began to be filled, but when these animals cannot be offered new habitats, this only delay extinction for some time.</p> <p>Downstream effects: The habitats along the rivers are altered because the sediment and organic material that is normally carried along by the flowing water is held back by the dam and sinks to the bottom or is spread on the banks of the reservoir. Flow in the rapids and waterfalls decreases or completely disappears when water is diverted to power stations or for irrigation. Species that are associated with rapids, waterfalls or the humid microclimate that arises in their vicinity diminish in numbers or completely disappear. The local species richness decreases, but few species are eradicated from the river systems.</p> <p>In the course of the Pench river, a dam to provide irrigation to about 70,918 hectare of land in Chhindwara and Seoni districts before entering into the Pench Tiger Reserve was constructed on the Pench River. Due to this, the flow of water into the Totladoh Dam in the Tiger Reserve changed. However, Project proponent did not sought permission under Wildlife (Protection) Act, 1972 for the construction of Machagora dam.</p> <p>Assessment of impact was not conducted by the Pench Tiger Reserve to address the direct and indirect issues aimed to map land use/ land cover patterns, to assess spatial structure and configuration of landscape, structure and composition of vegetation types in landscape, spatial and ecological distribution of major carnivore and herbivore species.</p> <p>The Field Director, Pench Tiger Reserve stated that the project proponents did not seek permission for assessment of impacts. Fact remains that the Field Director had not taken any suo-moto action against the construction of the new dam and for assessment of impacts on wildlife due to the construction. As a result, adverse impact as highlighted in research papers could not be known.</p>
2	Road widening in National Highway-7 in Pench Tiger Reserve	<p>National Highway-7 constitutes eastern boundary of Pench Mowgli Wildlife Sanctuary which is a part of Pench Tiger Reserve and is a vital part of Kanha-Pench corridor. There is a dense forest in eastern side of the road up to Kanha Tiger Reserve. As per Tiger Conservation Plan of Pench Tiger Reserve, National Highway-7 always possess great risk of accident by high-speed vehicle. Two tigers, 55 Chitals, one wild boar, one blue bull and one Samber were killed in the accident on National Highway-7 during 1995 to 2006. Existing Nagpur-Seoni National Highway-7 is already negatively impacting the wild fauna. The widening of the road and its associated ancillary activities would further jeopardise the wild fauna of Tiger Reserve in general and the tiger population in Kanha-Pench landscape in particular⁷.</p> <p>A road widening project was undertaken by National Highway Authority of India including in the part of the road passing through Pench Tiger Reserve. Central Empowered Committee of Honorable Supreme Court, in the matter relating to forest and wildlife clearance to the diversion of forest land for the project stated that the unanimous opinion of the wildlife experts, views/ observations of the standing</p>

⁶ The effect of dams on biodiversity, Roland Jansson, Department of Ecology and Environmental Science, Umea University, Sweden.

⁷ Wildlife Institute of India letter in May 2009.

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		<p>committee of the National Board for Wild Life, the Forest advisory committee and the Wildlife Institute of India, the Central Empowered Committee is of the considered view that the proposed widening and up-gradation of the National Highway-7 will cause irreparable damage, fragmentation and destruction to one of the most important and critical wildlife habitat in the country. It will also destroy the connectivity between the Pench Tiger Reserve and the Kanha Tiger Reserve something so vital for the wildlife conservation in the country. It is one of the last, perhaps the only, extensive track of wildlife habitat covering an area of 16,000 square kilometre. Such a habitat should be further consolidated and protected rather than be allowed to be fragmented and destroyed. The ecological cost of the present project is immense and no mitigation measures are adequate to compensate the same.</p> <p>It recommended that the use of forest land for the widening of the National Highway-7 between Nagpur and Seoni, should not be permitted. The National Highway Authority of India should instead be directed to realign the National Highway-7 via Chhindwara. Simultaneously, the movement of vehicles on the existing portion of the National Highway-7 passing through the Pench Tiger Reserve and buffer zone should be strictly curbed.</p> <p>However, wildlife clearance was accorded by the PCCF/ Wildlife to the project in April 2018 in compliance to decision in eighth meeting of State Board for Wild Life with mitigation measures for wildlife safety and recommendation of Central Empowered Committee of diverting the National Highway-7 through Chhindwara was ignored causing irreparable damage, fragmentation and destruction to the wildlife habitat.</p> <p>The Field Director, Pench Tiger Reserve stated that the proposal of widening was forwarded looking into public anger and decision was taken by the State Government. Evidently, the process to grant permit to widen the National Highway was initiated on the basis of public anger rather than in the interest of wildlife conservation.</p>
3	Diamond mining in Panna Tiger Reserve	<p>Diamond Mining Project of National Mineral Development Corporation was closed for certain legal issues. However, Hon'ble Supreme Court of India in its order in August 2008 accorded permission to reopen the Diamond Mining Project and constituted a Monitoring Committee for the National Mineral Development Corporation with the mandate for approval of the mine closure plan, prescribing and monitoring of various safeguards for operation of the mines etc. The approval granted by the Hon'ble Supreme Court expired on September 2013, however, as the National Mineral Development Corporation did not submit a coherent, time-bound mine closure plan.</p> <p>The Monitoring Committee in May 2015 directed National Mineral Development Corporation to remove all the exotic plants from the mine and surrounding area, within the next three months and place a compliance report before the committee. Non-compliance of such issue would be detrimental to the tiger and the herbivores as suggested by the Monitoring Committee. However, it was observed that the National Mineral Development Corporation has not placed any compliance report in this regard.</p> <p>The water released from mining activity to the Kamsan river/ nala creates a lot of problems to the wildlife as the water contains the kimberlite sand released from Diamond Mining Project. The Deputy Director, Panna Tiger Reserve expressed his concern in April 2019 over the negative impact of kimberlite and stated that the critical habitat is being harmed by the water mixed with kimberlite, response of National Mineral Development Corporation on this was awaited as of November 2019. Photo taken by the Audit party showing muddy water of Kamsan river/ nala due to kimberlite discharged by Diamond Mining Project.</p>

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		 <p>The Field Director, Panna Tiger Reserve stated that the State Government has made a communication with Government of India to seek directions in this regard, reply was awaited as of November 2019. Fact remains that due to this indecisiveness, Diamond Mining Project is continuing to release influx which is harmful for the health of wildlife and habitat.</p>
4	Sontalai-Bagratawa railway line in Satpura Tiger Reserve	<p>Chief Wild Life Warden granted wildlife clearance in May 2018 for construction of Sontalai-Bagratawa broad-gauge railway line to Executive Engineer (Construction-1), Habibganj, Bhopal on the basis of recommendation made by National Board for Wild Life in its 48th meeting. The PCCF/ Wildlife authorised, the Field Director, Satpura Tiger Reserve to ensure the execution of all the stipulated conditions in this Wildlife clearance.</p> <p>The National Tiger Conservation Authority had recommended the proposal subject to the strict adherence to the mitigation measures and no existing drainage should be blocked due to the construction and various contributing factors to train hit deaths: ecological, technical and lack of awareness among drivers, passengers and planners should be kept in mind during post project implementation. Considering the likelihood of animal movement in the area, at least 20 <i>per cent</i> of the proposed railway track alignment passing through forest land should be under mitigation measures (underpasses, fencing, etc.), installing cattle proof barriers or reinforced fences, enhancing the visibility for train drivers along sensitive sections, joint team comprising of watchmen for forest and railway departments along with installation of light and sound barrier etc.</p> <p>It was also recommended that the Chief Wild Life Warden may constitute a monitoring committee comprising for forest officials of Satpura Tiger Reserve, National Tiger Conservation Authority, Indian Railway and local NGO representatives to supervise the compliance of these conditions laid down by National Board for Wild Life. Records relating to these activities were not available on records and the same were also not provided in audit.</p> <p>The Field Director, Satpura Tiger Reserve stated that in the construction of Sontalai-Bagra Tawa railway line mitigation measures were implemented by the user agency. The copy of project and completion report of the work will be made available after obtaining it from the territorial Division.</p> <p>However, the monitoring committee was not formed as per directions of National Board for Wild Life and no progress reports of the execution of the project sent by the Field Director to the PCCF/ Wildlife. The Field Director did not ensure the execution of all the stipulated conditions in the Wildlife clearance.</p>

(Source: Forest Department)

From top, Left to right:

Tigers (Photo: Indranil Paul), Leopard (Photo: Varun Thakkar)

Tiger and herd of Chital (Photo: Siddhartha Vineet), Tiger and herd of Chital (Photo: David Raju)

Tiger (Photo: Farhan Khan), Tiger and herd of Chital (Photo: Durgesh Singh),

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