



सत्यमेव जयते

**Report of the  
Comptroller and Auditor General of India  
on  
Performance Audit of Protection, Conservation and  
Management of Wildlife Sanctuaries in Gujarat**



SUPREME AUDIT INSTITUTION OF INDIA  
लोकहितार्थ सत्यनिष्ठा  
Dedicated to Truth in Public Interest

**Government of Gujarat**  
*Report No 02 of the year 2023*  
**Performance Audit**

**Report of the  
Comptroller and Auditor General of India  
on  
Performance Audit of Protection, Conservation and  
Management of Wildlife Sanctuaries in Gujarat**

**Government of Gujarat**

*Report No. 02 of the year 2023*

**Performance Audit**



<b>Table of Contents</b>		
	<b>Reference to</b>	
	<b>Paragraph</b>	<b>Page</b>
Preface		iii
Executive Summary		v
<b>Chapter-I: Introduction</b>		
Introduction	1.1	1
Wildlife Sanctuaries and National Parks in Gujarat	1.2	2
Authorities for the regulation of activities in PAs	1.3	2
Organizational setup	1.4	3
Audit Objectives	1.5	3
Audit Coverage	1.6	4
Audit methodology	1.7	5
Audit criteria	1.8	5
Budget Provision and Expenditure	1.9	6
Acknowledgement	1.10	7
<b>Chapter-II: Forest Policies and Plans</b>		
State Forest Policy	2.1	9
Implementation of National Wildlife Action Plan	2.2	10
Implementation of Gujarat Bear Conservation and Welfare Action Plan	2.3	11
Critical Wildlife Habitats within Protected Area	2.4	13
Management Plan	2.5	14
Management Effective Evaluation (MEE) <i>vis-à-vis</i> Management Plans	2.6	17
Funds for execution of activities envisaged in Management Plan	2.7	19
<b>Chapter-III: Territorial integrity of the Sanctuaries, ESZ and Wildlife Corridors</b>		
Legal status of Jessore and Balaram Ambaji Sanctuary and settlement of rights and privileges	3.1	24
Difference in notified area <i>vis-à-vis</i> area as per study report	3.2	25
Alteration in Sanctuary area/ map of wildlife Sanctuary	3.3	26
Boundary Demarcation and Digitisation of Sanctuaries	3.4	27
Rights of persons <i>vis-à-vis</i> conservation of wildlife and its habitats	3.5	28
Eco-Sensitive Zones (ESZ)	3.6	30
Mutual consultations with neighbouring States regarding formation of ESZ	3.7	30
Preparation of Zonal Master Plan	3.8	32
Wildlife Corridors and their Management	3.9	33

<b>Chapter-IV: Research and Conservation Efforts for Flora/ Fauna</b>		
Research	4.1	37
Invasive Alien Species	4.2	40
Wildlife population estimation	4.3	42
Conservation of Fauna	4.4	43
Human wildlife conflict and rescue	4.5	45
Appointment of Honorary Wildlife Wardens	4.6	47
Good Practices	4.7	48
<b>Chapter-V: Protection of Wildlife Sanctuaries</b>		
Availability of frontline staff	5.1	51
Availability and status of arms	5.2	52
Patrolling and Check-posts	5.3	53
Communication devices	5.4	56
Illegal cutting of trees	5.5	57
<b>Chapter-VI: Non-Forest Activities in and around Sanctuaries</b>		
Widening of existing roads	6.1	60
Ecotourism	6.2	63
Revision of Gujarat Ecotourism Policy 2007	6.3	64
Development of ecotourism sites within protected areas	6.4	64
Tourism/ pilgrimage in the Sanctuaries	6.5	66

<b>List of Appendices</b>		
<b>Number</b>	<b>Particulars</b>	<b>Page</b>
I	Status of maintenance of Control Forms/ PA and Range Books/ Compartment History (July to October 2021)	73
II	Observations on boundary demarcation and digitization of Sanctuaries	75
III	Trend of increasing agriculture in Shoolpaneshwar Sanctuary	78
IV	Details of Invasive Alien Species, their effects and remedial action needed (as on 31 March 2021)	79

<b>Glossary</b>	
<b>Particulars</b>	<b>Page</b>
Glossary of Important Terms	81

## *Preface*

This report for the year ended 31 March 2021 has been prepared for submission to the Governor of the State of Gujarat under Article 151 of the Constitution of India for being laid before the State Legislature.

The report contains significant results of the Performance Audit of “Protection, Conservation and Management of Wildlife Sanctuaries in Gujarat” relating to Forests and Environment Department for the period from 2016-17 to 2020-21. The audit has been carried out under the provisions of the Comptroller and Auditor General’s (Duties, Powers and Conditions of Service) Act, 1971 and the Regulations on Audit and Accounts, 2007 (amended in 2020) issued thereunder by the Comptroller and Auditor General of India.

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



## Executive Summary

Gujarat has wide variations in geophysical and eco-climatic conditions ranging from hot saline deserts to humid hilly tracts and from coast to high hills, which have resulted in the formation of various types of forests. Due to this unique ecosystem, out of the 10 Biogeographic Zones in India, four are found in Gujarat. Further, out of 16 major forest types found in the country, four main types of forest ecosystems are found in Gujarat.

Wildlife refers to living organisms (flora and fauna) in their natural habitats. Like forests, wildlife is also a national resource that not only helps in maintaining the ecological balance but also is beneficial from economic, recreational, and aesthetic points of view. Gujarat is rich in faunal diversity being home to a wide variety of wildlife species. Over the years due to uncontrolled developmental activities, many species of flora and fauna have been pronounced extinct and several others are on the verge of extinction. As such the need for wildlife conservation has become a necessity.

There are 28 Protected Areas (PAs) in Gujarat which comprises four National Parks (NPs), one Conservation Reserve (CR), and 23 Wildlife Sanctuaries. The total area under PAs is 17,099.93 Sq. Km. of which 4,640.58 Sq. Km (27.45 *per cent*) is forest land and the remaining belongs to non-forest ecosystems which mainly consist of Kachchh Desert Sanctuary.

The protection, conservation and management of wildlife is regulated under provisions of the Wildlife (Protection) Act, 1972 (WPA), Environment (Protection) Act 1986 (EPA) apart from other relevant rules, regulations and guidelines issued from time to time by the Ministry of Environment, Forest and Climate Change (MoEF&CC).

The Performance Audit of ‘Protection, Conservation, and Management of Wildlife Sanctuaries in Gujarat’ was undertaken for the period 2016-17 to 2020-21 covering six wildlife Sanctuaries situated in North, Central and Southern parts of the State. The audit was conducted to ascertain the adequacy of planning and measures adopted, availability and optimal utilisation of resources for protection and conservation of wildlife in the State. The results of audit including principal findings and recommendation have been narrated in brief in the following paragraphs.

### **Forest Policies and Plans**

The State does not have a State specific forest policy. Further, the Department has not established a mechanism for ensuring implementation of provisions of the National Forest Policy and National Wildlife Action Plan. Some of the activities envisaged under the Gujarat Bear Conservation and Welfare Action Plan were yet to be completed. Declaration of Critical Wildlife Habitats (CWHs) in the Sanctuaries was not done even after lapse of 14 years of implementation of the Forest Rights Act. There were delays in preparation of management plans and Sanctuaries were being managed on ad-hoc basis. The management plans lacked uniformity in terms of mid-term evaluation, maintenance of control forms/ PA and Range Books/ Compartment History, etc. The Department did not utilise Management Effectiveness Evaluation (MEE)



Reports of Wildlife Institute of India (WII) during preparation and execution of the Management Plans of the respective Sanctuaries. Linkage between funds allocated and activities envisaged under Management Plan was missing. Due to non-submission of UCs for first installment, second installment under CSS-IDWH was not released for three years from 2016-17 to 2018-19. Considering the above deficiencies in the Plans and Policies, the following recommendations are made:

***Recommendation 1: The State Government may consider formulating State specific forest policy and implementation framework at the earliest.***

***Recommendation 2: The State Government may establish an effective framework for implementation of NWAP for management and conservation of wildlife in the State.***

***Recommendation 3: Funds released by the Central Government along with the stipulated State share may be promptly allocated to the protected areas and UCs may be submitted to the MoEF&CC as per the prescribed conditions.***

### **Territorial integrity of the Sanctuaries, ESZ and Wildlife Corridors**

Issuance of final notification under Section 26A of the WPA for substantial area falling under Balaram Ambaji and Jessore Sanctuaries was still pending. Further, there were deficiencies in the demarcation of Sanctuaries, demarcation records were not maintained properly and inspections were not adequate for avoiding encroachment of Sanctuary areas. Despite the provisions of the Forests Rights Act (FRA), which stipulates that no fresh land could be brought under use (including cultivation) after 2005, fresh areas were being cleared for cultivation.

Lack of proper planning, coordination, and follow-up with the neighbouring State Authorities regarding mutual consultations on ESZ, resulted in 'zero km' ESZ in Balaram Ambaji, Ratanmahal and Shoolpaneshwar Sanctuaries while ESZ on interstate border remained inadequate in Jessore Sanctuary. In the absence of a systematic approach for timely preparation of Zonal Master Plan (ZMP), the ZMPs in respect of the five Sanctuaries remained incomplete even after lapse of 12 months to 94 months since the stipulated dates of their formation. As such, the notification of ESZ did not serve the purpose of regulating development activities inside the respective ESZ.

The Department neither conducted any study itself to identify the precise corridors nor took cognizance of the findings of the scientific study conducted by ISRO for recognizing, protecting, and developing these wildlife corridors. The identified corridors were not included fully in the notified ESZ of Balaram Ambaji and Jessore Sanctuaries. There was need of dedicated plan for proper management of already identified corridors. Based on the above observations made regarding territorial integrity of the Sanctuaries, ESZ and Wildlife Corridors, the following recommendations are made:

***Recommendation 4: The Department may complete the process of settlement and final notification for Balaram Ambaji and Jessore Sanctuaries in a time-bound manner.***

***Recommendation 5: The Department may ensure proper demarcation of the boundaries of the Sanctuaries by constructing boundary pillars especially in areas where rights have been settled under the FRA.***

***Recommendation 6: The State Government may ensure preparation and implementation of ZMP of the notified ESZs in a time bound manner for regulation of activities inside the respective ESZ.***

***Recommendation 7: The corridors between the protected areas and other surrounding forests/ protected areas may be identified and plan for their management may be included in the Management/ Working Plan of respective Divisions.***

### **Research and Conservation Efforts for Flora/ Fauna**

The Department had not prepared a consolidated State Wildlife Research Plan. There was lack of research activities and proper mechanism for ensuring timely submission of research findings to the State Authorities/ WII was yet to be established.

The Sanctuaries were invaded by invasive alien species. However, despite having management prescription regarding control of invasive species, fodder plantation, natural regeneration and plantation activity, its execution was not satisfactory in the test-checked Sanctuaries.

The Department did not conduct in depth analysis of the estimated wildlife in terms of survival ratio/ pattern, seasonal patterns of movement, basic migratory routes and areas of high species density and diversity, etc. Special efforts were required for reintroduction/ conservation of the locally extinct species. However, measures taken by the test-checked Sanctuaries to stabilize/ improve such species were not commensurate with the requirements for conservation. Breeding Centre was required to be established at Jambughoda Sanctuary and the Centres in Ratanmahal and Shoolpaneshwar Sanctuaries were to be operationalised/ utilised as per the needs identified. Despite instances of human-wildlife conflicts; the Sanctuaries were not equipped to deal with such conflicts both in terms of human resources and equipment. Honorary Wildlife Wardens (HWW) were not being appointed on regular basis. In view of deficiencies noticed in the research and conservation efforts for flora and fauna, the following recommendations are made:

***Recommendation 8: The Department may prepare and implement a State Wildlife Research Plan to ensure that research is conducted in an integrated and effective manner.***

***Recommendation 9: The Department may undertake a phased programme for identification of areas invaded by invasive species and removal thereof, along with its replacement with the indigenous fruits, fodder and other suitable species.***

***Recommendation 10: The rescue centers may be provided with the required human resources including full-time veterinary doctors and equipment/gears, medicines, and other materials.***

### **Protection of Wildlife Sanctuaries**

Forest personnel were trained on a rifle other than the one currently used by the Department. Check-posts/ naka were either not established or were inoperative and lacked adequate staff, rendering them ineffective for protection of wildlife and its habitats. Sanctuaries were not adequately equipped with 24X7 communication devices. Due to these lacunae in the protection function, illegal cutting of trees was prevalent in the Sanctuaries. Based on the above observations made regarding protection of wildlife Sanctuaries, the following recommendations are made:

***Recommendation 11: The Department may ensure that check post/ naka are established at strategic locations, properly maintained, and provided with adequate staff to ensure their effectiveness.***

***Recommendation 12: The Department may consider equipping the field staff state-of-the-art communication and surveillance devices to effectively control activities detrimental to wildlife habitats.***

### **Non-Forest Activities in and around Sanctuaries**

The user agencies either did not apply under the Forest Conservation Act (FCA)/ Wildlife Protection Act (WPA) for obtaining necessary approval or completed the work of widening of roads despite pendency of approval from MoEF&CC and NBWL. The concerned authority had certified the details (regarding location of road project with reference to protected area/ ESZ and compliance to the provisions of FCA) incorrectly while forwarding the proposal to MoEF&CC which indicated inadequate monitoring over the Protected Areas and ESZ and lack of adequate scrutiny of the proposals. This also led to non-submission of application for required clearance from NBWL. The user agencies had applied for lesser land than the actual requirement.

The State Ecotourism Policy 2007 was not updated/ modified considering the provisions of 'Policy for ecotourism in forest and wildlife areas' issued by MoEF&CC in 2018. Ecotourism sites were developed in the Sanctuaries in violation of FCA and WPA. Site specific ecotourism plans were not developed for any of the Sanctuaries test-checked by Audit. The Department neither devised any monitoring mechanism for regulated access nor fixed the carrying capacity of the respective Sanctuary based on scientific study. As such, there was no ceiling limit of visitors and vehicles and impact of tourism/ pilgrimage on the natural environment remained to be monitored and regulated. The Sanctuaries were open to tourists all through the year, which would adversely affect mating and regeneration of wildlife. In view above observations, the following recommendation is made:

***Recommendation 13: The Department may ensure proper scrutiny of the proposal for any development project, regarding project location with reference to protected area/ ESZ/ wildlife corridor and commencement of work may be allowed only after receipt of all the necessary permissions.***

# CHAPTER-I

## INTRODUCTION

### 1.1 Introduction

Gujarat has wide variations in geophysical and eco-climatic conditions ranging from hot saline deserts to humid hilly tracts and from coast to high hills, which have resulted in the formation of various types of forests. The State has vast grasslands and scrub forests in Kachchh, Central Gujarat, and Saurashtra regions while coastal ecosystems such as mangroves, coral reefs, and seagrasses are located in western parts of the State. Further, saline deserts are located in the north, while moist deciduous tropical forests are found in southern areas. Hilly forests are found in the eastern parts and Saurashtra regions. As per the Champion and Seth Classification system, out of 16 major forest types found in the country, four main types of forest ecosystems<sup>1</sup> are found in Gujarat. Gujarat has a total geographical area of 1,96,244 sq. km. Of this, 21,870.35 sq. km. (11.14 *per cent*) geographical area is declared as forest. It comprises 14,574.30 sq. km. Reserve Forest (RF); 2,898.25 sq. km. Protected Forest (PF), and 4,397.80 sq. km. Unclassed Forest.

Wildlife refers to living organisms (flora and fauna) in their natural habitats. Like forests, wildlife is also a national resource that not only helps in maintaining the ecological balance but also is beneficial from economic, recreational, and aesthetic points of view. Gujarat is rich in faunal diversity being home to a wide variety of wildlife species. It is the only home of Asiatic Lion and Indian Wild Ass.

Over the years due to uncontrolled developmental activities, many species of flora and fauna have been pronounced extinct and several others are on the verge of extinction. Deforestation is also one of the main reasons for the loss of wildlife. Further, illegal hunting, habitat reduction (due to development activities) and its degradation has threatened the biodiversity of the regions where these are rampant. As such the need for wildlife conservation has become a necessity.

The Wildlife (Protection) Act, 1972 (WPA) empowers the State Government to notify an area of adequate ecological, faunal, floral, geomorphological, natural, or zoological significance as a Protected Area (PA). As per WPA, Protected Area can consist of Wildlife Sanctuary (Sanctuary), National Park (NP), Conservation Reserve and Community Reserve.

Wildlife Sanctuary is reserved for the conservation of wildlife wherein human activities like harvesting timber, collecting minor forest products, and private ownership rights are allowed as long as those do not interfere with the well-being of wildlife. National Parks are strictly reserved for the betterment of the

---

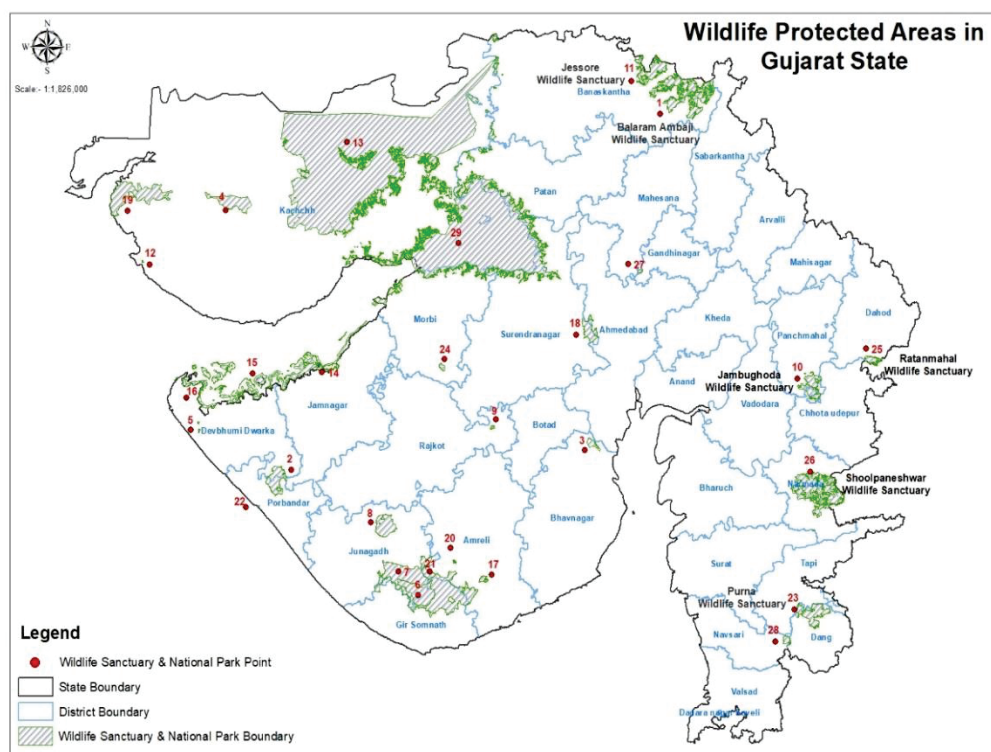
<sup>1</sup> (1) Tropical Moist Deciduous Forests (2) Littoral and Swamp Forests (3) Tropical Dry Deciduous Forests (4) Tropical Thorn Forests.

wildlife and biodiversity where activities like development, forestry, poaching, hunting, and grazing or cultivation are not permitted.

## 1.2 Wildlife Sanctuaries and National Parks in Gujarat

As on September 2022, there are 28 PAs (as shown in Map below) in Gujarat which comprises four NPs, one Conservation Reserve<sup>2</sup> (CR), and 23 Wildlife Sanctuaries. The total area under PAs is 17,099.93 Sq. Km. of which 4,640.58 Sq. Km (27.45 per cent) is forest land and the remaining belongs to non-forest ecosystems which mainly consist of Kachchh Desert Sanctuary.

Map 1.1: Protected Areas<sup>3</sup> in Gujarat as on September 2022



Source: Map furnished by GIS Cell, Gujarat Forest Department.

## 1.3 Authorities for the regulation of activities in PAs

Regulation of the activities in the PAs is governed by the WPA, which is further complemented by the Forest Conservation Act (FCA), 1980 and the Environment (Protection) Act (EPA), 1986. The following authorities have important role in ensuring compliance with the provisions of the above Acts.

<sup>2</sup> Conservation Reserve is a type of PA, which is declared so by the State Government for protecting landscapes, seascapes, flora and fauna and their habitat. These areas are owned by the Government and lie adjacent to National Parks and Sanctuaries and include those areas which link one PA with another.

<sup>3</sup> 1) Balam Ambaji 2) Barda 3) Black Buck National Park 4) Chharidhandh Conservation Reserve 5) Gaga Bird Sanctuary 6) Gir 7) Gir National Park 8) Girnar 9) Hingolghadh 10) Jambughoda 11) Jessore 12) Kachchh Bustard Sanctuary 13) Kachchh Desert Sanctuary 14) Khijadiya Bird Sanctuary 15) Marine National Park 16) Marine Sanctuary 17) Mitiyala 18) Nalsarovar Bird Sanctuary 19) Narayan Sarovar 21) Paniya 22) Porbandar Bird Sanctuary 23) Purna 24) Rampara 25) Ratanmahal 26) Shoolpaneshwar 27) Thol Bird Sanctuary 28) Vansda National Park 29) Wild Ass Sanctuary.

**National Board of Wildlife (NBWL):** It is a statutory Board constituted under Section 5 of the WPA and is headed by the Prime Minister as Chairperson. The role of NBWL *inter alia* includes to make recommendations on the matters relating to restriction of activities in the PA.

**State Board of Wildlife (SBWL):** It is constituted under Section 6 of the WPA and is headed by the Chief Minister of the State as Chairperson. The duty of SBWL is to advise the State Government in selection of areas to be declared as PA, deciding line of action for protection of PA and wildlife, etc.

#### 1.4 Organizational setup

The Forests and Environment Department (F&ED), Government of Gujarat (GoG) has Environment Wing and Forest Wing. The F&ED is headed by the Additional Chief Secretary. The Forest Wing (henceforth called the Department in this report) is entrusted with the prime responsibility of protection, conservation and development of forests and wildlife of the State. While the Principal Chief Conservator of Forests and Head of Forest Force (PCCF & HoFF) is the functional head of the Department; the Principal Chief Conservator of Forests (Wildlife) (herein after called PCCF (WL)) is responsible for control, management and maintenance of the PAs, and deals with all wildlife related activities. PCCF(WL) also acts as the Chief Wildlife Warden of the State under Section 4 of the WPA. The PCCF (WL) is assisted by the Additional PCCF (WL), Chief Conservators of Forests (CCFs) at the Circle level, and Deputy Conservators of Forests (DCFs), at the Divisional level. The DCF of the respective Sanctuary acts as the Sanctuary Superintendent.

#### 1.5 Audit Objectives

The Performance Audit of ‘Protection, Conservation and Management of Wildlife Sanctuaries in Gujarat’ was conducted to get a reasonable assurance that

1. planning for the protection, conservation, and management of the Sanctuaries was adequate;
2. measures adopted for conservation and protection of the Sanctuaries were adequate,
3. allocation and release of funds were adequate and timely, and subsequent utilisation of financial resources was economical and efficient; and,
4. the required human and infrastructure resources were available and optimally utilised.

## 1.6 Audit Coverage

The Performance Audit covered six Wildlife Sanctuaries. Jurisdictional control of the six selected Sanctuaries is as under:

**Table 1.1: Notification and jurisdictional geographical area of the six wildlife Sanctuaries as on November 2022**

Sl. No.	Name of Sanctuary	Year of notification	Area in Sq. Km.	Jurisdiction Division	Circle
<b>North Gujarat</b>					
1	Balaram Ambaji	1989	544.78	Banaskantha Forest Division, Palanpur	Gandhinagar Wildlife Circle
2	Jessore	1978	180.66	Banaskantha Forest Division, Palanpur	
<b>Central Gujarat</b>					
3	Jambughoda	1990	130.38	Vadodara Wildlife Division, Vadodara	Wildlife Circle Kevadiya*
4	Ratanmahal	1982	55.65	Vadodara Wildlife Division, Vadodara	
<b>South Gujarat</b>					
5	Shoolpaneshwar <sup>4</sup>	1982	607.70	Narmada Forest Division, Rajpipla	Wildlife Circle Kevadiya*
6	Purna	1990	160.84	Dangs (North) Forest Division, Ahwa	Valsad Forest Circle

Source: Records maintained by the Forests Department.

\*Erstwhile Vadodara Wildlife Circle.

A brief introduction of the selected Sanctuaries is as under.

### ***Balaram Ambaji and Jessore Sanctuaries:***

Balaram Ambaji and Jessore Sanctuaries harbour several species of rare medicinal herbs and shrubs together with rare and endangered species of wildlife. The flagship species of both Sanctuaries is the Sloth Bear. The major carnivore at the apex of the food chain is Leopard and other vertebrates inhabiting the area include the Striped Hyena, Jungle Cat, Jackal, Wolf, Indian Fox, Common Langur, Blue Bull, Indian Hare, and Wild Boar.

### ***Jambughoda Sanctuary:***

Jambughoda Sanctuary is home to 33 species of mammals and about 215 species of birds. The major mammals are Leopard, Hyena, Sloth bear, Blue bull, Common Langoor, Indian hare, etc.

***Ratanmahal Sanctuary:*** The Sloth Bear is the flagship species of this area and 28 mammal species belonging to 14 families are recorded within the Sanctuary area.

<sup>4</sup> One Range namely "Gora Range" had been transferred under the jurisdiction of the newly established Kevadiya Forest Division (KFD) with effect from 01 January 2020. KFD is working under the control of Statue of Unity Area Development and Tourism Governance Authority (the Kevadiya Authority).

**Shoolpaneshwar Sanctuary:** The Sanctuary has 309 vertebrate species belonging to fishes, amphibians, reptiles, birds, and mammals. Leopard is the top predator and Jungle Cat, Rusty-spotted Cat, Common Jackal, Indian Fox are other important predators. Barking deer and Four-horned Antelope are important herbivores.

**Purna Sanctuary:** This Sanctuary harbours 24 species of mammals, 18 species of reptiles, 142 species of birds, and more than 3,000 species of insects. The main carnivores are Leopard, Hyena, Rusty-spotted Cat, Jungle Cat, Jackal, and Fox. Chital, Barking Deer, and Four-horned Antelope are major herbivores.

## 1.7 Audit methodology

The audit was conducted by test check of the records for the period 2016-17 to 2020-21 in respect of six selected Sanctuaries at the field level offices having jurisdiction over the selected Sanctuaries and at the office of PCCF (WL). Data was collected through analysis of documents and responses to audit queries/questionnaires. The Audit party also made joint site visits of all the six selected Sanctuaries along with concerned forest officials.

A satellite-based ‘Land Use Land Cover’ (LULC)<sup>5</sup> analysis in and around selected Sanctuaries was conducted with the help of Space Application Centre (SAC), Ahmedabad (a centre of Indian Space Research Organisation (ISRO)). For this purpose, maps, and Keyhole Markup Language (KML) files were obtained from the Geographic Information System (GIS) cell of the Department.

An Entry Conference was held with the PCCF & HoFF, PCCF (WL), and other senior officers on 5 January 2021, wherein the audit objectives, audit methodology, scope, and criteria were explained. The audit findings were discussed in the Exit Conference held with the PCCF & HoFF, PCCF (WL), and jurisdictional DCFs on 20 October 2022. Government/ Department responses, wherever furnished, have been suitably incorporated in this report.

## 1.8 Audit criteria

The Performance Audit was conducted using the following Audit criteria:

- 1) The Wildlife (Protection) Act 1972,
- 2) The Indian Forest Act 1927,
- 3) The Forest (Conservation) Act 1980,
- 4) National Wildlife Action Plan 2002-16 and 2017-31,
- 5) National Forest Policy 1988,
- 6) National Bear Conservation and Welfare Action Plan 2012-17,
- 7) Wildlife Conservation Strategy 2002, MoEF&CC,
- 8) Forest Rights Act, 2006,

<sup>5</sup> Land Use Land Cover (LULC) is an important indicator of changes happening in and around the protected areas which have a bearing on the conservation and protection of wildlife and their habitat. Changes in LULC were analysed over a period of 1980 to 2020 with regard to the eight parameters (i) Very Dense Forest, (ii) Moderately Dense Forest, (iii) Open Forest, (iv) Degraded Forest, (v) Highly Degraded Forest, (vi) Water Body, (vii) Agriculture and (viii) Built up area including Roads and Railways.



- 9) Notification of Eco-Sensitive Zones around wildlife Sanctuaries and NPs under the Environment (Protection) Act 1986,
- 10) Guidelines/ Instructions issued by the Central/ State Government,
- 11) Management Plan and Annual Plan of Operation of the six selected Sanctuaries,
- 12) A Guide for Planning Wildlife Management in Protected Areas and Managed Landscapes published by Wildlife Institute of India (WII),
- 13) Various Court Verdicts,
- 14) Research/ study reports/ guidelines of the WII, International Union for Conservation of Nature (IUCN), etc.

## 1.9 Budget Provision and Expenditure

The Wildlife Conservation Strategy 2002 of MoEF prescribes that the Wildlife and Forests shall be declared priority sector at the national level for which funds should be earmarked. The details of the budget provision in respect of F&ED as against the total budget provision of the Government of Gujarat during the years 2016-17 to 2020-21 is as under:

**Table 1.2: Budget provision for F&ED vis-a-vis total budget of the Government**

Year	(₹ in crore)	
	Total provision in Budget for F&ED	Total provision in Budget for all the Departments of Gujarat
2016-17	1,000	85,557.78
2017-18	1,225.86	1,72,179.24
2018-19	1,287.15	1,83,666.38
2019-20	1,454.14	2,04,815.00
2020-21	1,780.98	2,17,287.24
<b>Total</b>	<b>6,748.13</b>	<b>8,63,505.64</b>

Source: Annual financial statement of Government of Gujarat.

Thus, it can be seen from **Table 1.2** that the total budget provision for the F&ED during 2016-21 was less than one *per cent* (only 0.78 *per cent*) of the total budget provision of the State Government.

Against the above budget provision of ₹ 6,748.13 crore, allocation of ₹ 6,163.69 crore was made to the Department out of which, the Department released ₹ 6,120.46 crore to the Office of the PCCF and HOFF. Against this, expenditure of ₹ 6,005.23 crore was incurred on various schemes/ activities, which included expenditure of ₹ 823.02 crore on protection, conservation, and management of protected areas. This amounted to only 13.71 *per cent* of the total expenditure incurred by the PCCF and HOFF. The details are shown in the following table.

Table 1.3: Details of budget provision, funds released and actual expenditure

(₹ in crore)

Year	Total Budget and expenditure of the Department			Protection, conservation, and management of protected areas			Percentage of funds released for protected areas vis-à-vis total funds released by the Department (8)= (6)/(3) x 100
	Budget Provision	Funds Released	Expenditure incurred	Budget Provision	Funds Released	Expenditure incurred	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	
2016-17	1,099.00	1,076.66	1,069.67	145.59	142.61	142.00	13.25
2017-18	1,173.97	1,160.79	1,151.94	133.42	127.61	123.60	10.99
2018-19	1,257.95	1,253.27	1,237.38	174.81	173.17	165.00	13.82
2019-20	1,376.95	1,374.60	1,293.75	286.87	286.87	218.68	20.87
2020-21	1,255.82	1,255.14	1,252.49	173.71	173.71	173.74	13.84
<b>Total</b>	<b>6,163.69</b>	<b>6,120.46</b>	<b>6,005.23</b>	<b>914.40</b>	<b>903.97</b>	<b>823.02</b>	<b>14.77</b>

Source: Information provided by the Department.

Thus, between 2016-17 and 2020-21, the funds released for protection, conservation and management of protected areas ranged between 11 to 21 *per cent* of the total funds released to the Department.

Thus, despite the MoEF prescribing the wildlife as a priority sector, the allocation of funds by the State Government to the F&ED continued to be meagre.

## 1.10 Acknowledgement

Audit acknowledges the co-operation extended by the office of the PCCF (WL), jurisdictional divisions and Space Application Centre, Ahmedabad in the conduct of this Performance Audit. Further, Audit also acknowledges the expert views of Dr. Nishith Dharaiya, Associate Professor (Environment Science) at Department of Life Sciences, Hemchandracharya North Gujarat University, Patan (Gujarat) for providing his expert views and guidance on the topic.



## CHAPTER-II

### Forest Policies and Plans

#### ***A Snapshot***

*The State does not have a State specific forest policy. Further, the Department has not established a mechanism for ensuring implementation of provisions of the National Forest Policy and National Wildlife Action Plan. Some of the activities envisaged under the Gujarat Bear Conservation and Welfare Action Plan were yet to be completed. Declaration of Critical Wildlife Habitats (CWHs) in the Sanctuaries was not done even after lapse of 14 years of implementation of the Forest Rights Act. There were delays in preparation of management plans and Sanctuaries were being managed on ad-hoc basis. The management plans lacked uniformity in terms of mid-term evaluation, maintenance of control forms/ PA and Range Books/ Compartment History, etc. The Department did not utilise Management Effectiveness Evaluation (MEE) Reports of Wildlife Institute of India (WII) during preparation and execution of the Management Plans of the respective Sanctuaries. Linkage between funds allocated and activities envisaged under Management Plan was missing. Due to non-submission of UCs for first installment, second installment under CSS-IDWH was not released for three years from 2016-17 to 2018-19.*

#### **Introduction**

The Department is entrusted with the prime responsibility of protection, conservation, and development of forests and wildlife in the State. To fulfil its responsibility, it is essential that the Department prepares and updates suitable policies and plans and implements the existing policies /plans scrupulously. In this chapter, Audit has analysed various policies and plans aimed at protection, conservation, and management of wildlife in the State in general and the six test-checked Sanctuaries in particular.

#### **2.1 State Forest Policy**

Forest Policy provides a strategy for forest conservation that focuses on preservation, maintenance, sustainable utilisation, restoration, and enhancement of the natural environment.

As per the National Forest Commission Report 2006, within the broad parameters of the National Forest Policy, each State should have its own forest policy statement for sustainable management of its forest and wildlife resources. Further, a mechanism needs to be in place at the State level to monitor the implementation of forest policy provisions and suggest rectifications.

In the Audit Report (Civil), Government of Gujarat for the year ended 31 March 2009, of the Comptroller and Auditor General (CAG) of India, it was pointed out that the State had not prepared its specific forest policy. Audit noticed that even after 15 years since the report of the National Forest Commission, and after

being pointed out by the CAG; Gujarat has not prepared its forest policy till date (November 2022).

In the absence of a State-specific policy, provisions of the National Forest Policy must be adhered to for the protection, conservation, and development of forests in the State. However, Audit observed that there was no implementation and monitoring framework/ mechanism in the form of measurable targets, objectively verifiable indicators, financial allocations, and time schedules for the implementation of commitments made in the National Forest Policy. The Department did not implement various prescriptions contained in the National Forest Policy regarding conservation and protection of wildlife as discussed in paragraphs 2.5 (Management Plan), 3.9 (Wildlife Corridors), 3.5 (Encroachment of forest land), 4.1 (Research) and 4.3 (Wildlife estimation) of this report.

The Department stated (November 2022) that preparation of the State forest policy was under process and would be submitted to the State Government soon for approval.

***Recommendation 1: The State Government may consider formulating State specific forest policy and implementation framework at the earliest.***

## **2.2 Implementation of National Wildlife Action Plan**

The first National Wildlife Action Plan (NWAP-1) was issued by the Ministry of Environment and Forest (MoEF) in 1983. Aiming to have a concerted approach to protection, conservation, and management of wildlife throughout the country, the plan was implemented up to 2001. On its completion and based on new concerns and challenges, a new National Wildlife Action Plan (NWAP-2) was put in place for the period 2002-2016. Both the plans were based on Protected-Area-centric approach.

Subsequently, the NWAP-3 for the period 2017-2031, was circulated (September 2018) by the MoEF&CC to the Chief Wildlife Wardens of the States which adopts a landscape approach in conservation of all wildlife. The key focus areas are wildlife health management, strengthening research and monitoring, mitigation of human-wildlife conflict, management of tourism in wildlife areas, people's participation in wildlife conservation, integration of climate change into wildlife planning etc. As the areas identified in the NWAP were critical for the protection, conservation, and management of wildlife, an implementation framework needs to be prepared and executed for effective implementation and monitoring of the provisions of the NWAP.

Audit observed that the Department had neither prepared (September 2022) any implementation framework for implementing the NWAP nor has come up with a State specific wildlife action plan. Audit further observed that the Department did not implement various prescriptions contained in the NWAP regarding conservation and protection of wildlife as discussed in paragraphs 2.2.1 (Preparation of Annual Report of Protected Areas), 2.4 (Declaration of Critical wildlife habitat), 2.5 (Delay in Preparation of Management Plan), 2.6 (implementation of recommendations of MEE Report), 3.9 (Identification of

corridors and their inclusion in ESZ) and 4.1 (Research on impact of development activities on PA) of this report.

The Department assured (October 2022) that State specific wildlife action plan would be prepared. The Department also stated (November 2022) that the NWAP would be taken into consideration during preparation of the Management Plans.

***Recommendation 2: The State Government may establish an effective framework for implementation of NWAP for management and conservation of wildlife in the State.***

### **2.2.1 Annual Report of Protected Areas**

The NWAP-2 (2002-16) stipulated that the Annual Report of all the Protected Areas (PAs) be prepared which should include management achievements and principal threats to the PA or wildlife and measures taken to reduce the threats. The Annual Reports were required to be placed before the State Board for Wild Life (SBWL). These reports could be highly effective in gauging the progress on the management plans and addressing the threats to the PAs and enable taking corrective measures and necessary course corrections, if required.

During scrutiny of the documents of the Department, neither any annual report was found on record nor such report was provided (November 2022) by the Department despite being requested (January 2021) by Audit.

Thus, audit could not ascertain whether annual reports were prepared and submitted to the SBWL.

## **2.3 Implementation of Gujarat Bear Conservation and Welfare Action Plan**

India is home to four of the eight species of Bears in the world. In the face of increasing pressures of habitat loss, fragmentation and degradation due to rapid development, natural resource dependency of local communities, etc., MoEF&CC released (November 2012) the National Bear Conservation Action Plan (NBCAP) 2012 as an instrument for long-term conservation for these species. The NBCAP included State Action Plans of 26 States including Gujarat and proposed various management actions under seven themes<sup>1</sup> to ensure stable status of bear species and minimal bear-human conflicts.

In Gujarat, Sloth Bears are found in five protected areas *viz.* Balaram Ambaji, Jessore, Jambughoda, Ratanmahal and Shoolpaneshwar (selected under the Performance Audit) as well as several unprotected forest patches of Sabarkantha, Banaskantha, Mehsana and Panchmahal districts.

The available Bear habitats in the State face pressure in the form of livestock grazing, tourism and developmental activities like road construction and

<sup>1</sup> (i) Protection from illegal trade in bear parts, (ii) Bear human conflict mitigation, (iii) Habitat management, (iv) Research and information, (v) Capacity development, (vi) Communication and education and (vii) Policy and legislation.

expansion, and mining, which lead to degradation of habitat and fragmentation of forest patches. Gujarat Bear Conservation and Welfare Action Plan (GBCWAP), 2012 proposed various activities with timeframe for conservation of the Sloth Bear.

Audit observed that important activities envisaged under the GBCWAP were either pending or partially achieved as on March 2021 as detailed in the table below.

**Table 2.1: Status of implementation of activities envisaged in GBCWAP (as on March 2021)**

Sl. No.	Activity envisaged in the GBCWAP	Status
1	Development of Protocol for conducting scientific and systematic census of sloth bear in Gujarat by 2013-14.	<p>The Department did not develop any Protocol and the old method (as in the year 2011) viz. direct sighting and sign survey were employed during the estimation of sloth bear in the latest survey of bears conducted in the year 2016.</p> <p>The Department confirmed (November 2022) the audit observation.</p> <p>The issue has been discussed in detail in paragraph 4.3 of this report.</p>
2	Preparation of a plan by 2013 to regulate traffic in night in vicinity of bear habitats, especially in tourist and pilgrim seasons and fixing the specific time periods for pilgrims and tourists for visiting the places located in the Sanctuary such as Kedarnath Temple (Jessore Sanctuary), Balaram and Ambaji Temple (Balaram Ambaji Sanctuary), Zand Hanuman Temple (Jambughoda Sanctuary).	<p>The Department did not develop any eco-tourism plan for addressing the issues of high volume of pilgrims visiting the temples, provision of facilities for pilgrims and reducing the impact of pilgrimage on the wildlife.</p> <p>The Department stated (November 2022) that pilgrimage was being regulated in the Kedarnath temple, however no supporting documents were furnished for establishing the same.</p> <p>No reply regarding the other two pilgrimage sites was furnished.</p>
3	Habitat restoration of corridor between fragmented forest patches in Gujarat by 2013-16.	<p>As per last Bear census held in 2016, maximum Sloth Bears were found in and around the Ratanmahal Sanctuary, major portion of which falls in the Panchmahal district. Ratanmahal is connected with Jambughoda through corridors located in Chhota Udepur and Godhra Forest Divisions. No plan for corridor management was included in the working plan of Chhota Udepur Forest Division for the period 2017-18 to 2026-27 approved in January 2018. On the other hand, working plan of Godhra Forest Division (Panchmahal District) had expired in 2017-18 and a new plan was yet to be prepared by the working plan wing of the Department (January 2022). It was also observed that no</p>

Sl. No.	Activity envisaged in the GBCWAP	Status
		<p>separate plan for management of corridors existed in these divisions. Thus, the Department did not have any plan for habitat restoration of this corridor.</p> <p>In reply, the Department confirmed (November 2022) that the GBCWAP was not communicated to the jurisdictional division of Ratanmahal and Jambughoda Sanctuaries.</p>
4	Commissioning of separate rescue and conflict management team for Gandhinagar and Vadodara Wildlife Circle by 2013.	<p>As of January 2022, only Gandhinagar Wildlife Circle had established 'Rapid Response Team' in March 2021 i.e., after a lapse of eight years from the prescribed timeline.</p> <p>The Department stated (November 2022) that the GBCWAP was not communicated to the concerned division.</p> <p>Thus, the Vadodara Wildlife Circle did not establish the separate rescue and conflict management team.</p>

## 2.4 Critical Wildlife Habitats within Protected Area

Forest Rights Act 2006 (FRA) defines "Critical wildlife habitat" as such areas of National Parks and Sanctuaries where it has been specifically and clearly established that such areas are required to be kept as inviolate for the purposes of wildlife conservation. No forest rights holders shall be resettled or have their rights in any manner affected for the purposes of creating inviolate areas for wildlife conservation except when it has been established by the State Government that the activities or impact of the presence of holders of rights upon wild animals is sufficient to cause irreversible damage and threaten the existence of said species and their habitat. Further, NWAP-2 (2002-16) aimed to bring 10 *per cent* of India's landmass under the PA network, of which at least half should be inviolate habitats.

To identify/ notify Critical Wildlife Habitat (CWH), the MoEF&CC issued Guidelines in October 2007 (revised in February 2011) and fresh Guidelines in January 2018. As per the Guidelines of January 2018, the State Chief Wildlife Warden (PCCF (WL)) was required to notify Expert Committee(s)<sup>2</sup> for identification of CWH in each NP or Sanctuary. The Committee was expected to conduct field visits and identify CWH based on scientific and objective criteria and after open consultations with forest rights holders. After following the prescribed procedure, the MoEF&CC was to notify the CWH.

Forest Rights Act 2006 (FRA) is being implemented in Gujarat since 2008. In compliance to these Guidelines, the PCCF (WL) issued instruction (July 2019)

<sup>2</sup> The Expert Committee shall consist of Conservator of Forest of the concerned NP/ Sanctuary as Chairperson along with DCF/ ACF of the NP/ Sanctuary as member-secretary and representative of the Ministry of Tribal Affairs (MoTA), social scientist, experts of life sciences and President/ *Sarpanch* of the villages falling under the NP/ Sanctuary, as members.



to all concerned CCFs and DCFs to submit proposals for constitution of Expert Committees for the declaration of CWH. Audit observed that out of the six test-checked Sanctuaries, only two i.e., Ratanmahal and Jambughoda, submitted (September 2020) the said proposals to the PCCF (WL), which were yet to be approved (November 2022). Remaining four Sanctuaries did not submit any proposal even after lapse of over three years (November 2022).

Thus, declaration of CWHs in the Sanctuaries was yet to be done even after lapse of 14 years of implementation of the FRA. The Department could not establish PA wise Expert Committees till date (November 2022), which was the first step to initiate proceedings for the declaration of the CWH. Absence of declared CWH in the Sanctuaries was detrimental to the conservation of flora and fauna in the Sanctuaries as the same could have served as inviolate areas and would have guided re-settlement of forest dwellers, wherever necessary.

The Department stated (November 2022) that identification of CWH was under progress and proposal would be submitted to the State Government.

## **2.5 Management Plan**

Management Plan is a document which sets out the values and objectives of management for a Protected Area and presents strategies and operational schedules for achievement of the objectives within a time bound framework. It is typically prepared to serve for a period of 10 years. The NWAP-2 (2002-16) and the NWAP-3 (2017-31), provide that each PA should have its own Management Plan, based on scientific and ecological data.

Audit analysed various aspects of planning process and noticed absence of centralised management plan development cell, delay in preparation of management plans, absence of site specifications in management plans and lack of uniformity in management plans as discussed in the subsequent paragraphs:

### **2.5.1 Management Plan Development Cell at State Forest Department**

The NWAP-2 (2002-16) and NWAP-3 (2017-31) envisaged establishment of a central monitoring mechanism/ Management Plan Development Cell at headquarters of all State Forest Departments to ensure timely preparation of management plan/ schemes, review the quality of PA management plans, monitor their implementation and periodically review the management effectiveness of the PAs. Further, the Wildlife Institute of India (WII) Guidelines<sup>3</sup> 2005 recommends establishment of an independent cell within the Forest Department for an effective wildlife planning process.

Audit observed that no Management Plan Development Cell exists either at the F&ED or at the Office of PCCF (WL). Absence of such a Cell led to gaps between consecutive management plans and delay in preparation of Management Plans as discussed below:

---

<sup>3</sup> A guide for planning wildlife management in Protected Areas and managed landscapes- Vishwas B. Sawarkar, prepared by WII serves as a manual for preparation of management plans.

### 2.5.1.1 Preparation of Management Plans

In order to avoid gap between two consecutive Management Plans, the work of preparation of next Management Plan should be initiated well in advance before the expiry of the prevailing Management Plan. The PCCF (WL) instructed (June 2010) the respective Circles to prepare the new management plans according to the WII Guidelines. The timelines for preparation of Management Plans in respect of test-checked Sanctuaries is shown in the following table:

**Table 2.2: Details of gaps between two consecutive management plans**

Name of the Sanctuary	Month/Year of expiry of existing management plan	Initiation of process of preparation of management plan	Approval of the new Management Plan	Gap between the current and the last management plan (in years)	Period of new management plan
Jessore	March 2006	June 2006	September 2021	15	April 2021-March 2031
Balaram Ambaji	March 2007	June 2006	September 2021	14	April 2021-March 2031
Jambughoda	March 2011	June 2010	October 2012	01	April 2012-March 2022
Shoolpaneshwar	March 2012	June 2010	December 2016	05	April 2017-March 2027
Purna	March 2011	June 2010	December 2014	03	April 2014-March 2024

Source: Information furnished by the Department.

While there was no gap between consecutive management plans for the Ratanmahal Sanctuary, there were gaps between two consecutive management plans for the remaining five test checked Sanctuaries which ranged between one and fifteen years. The same could have been addressed had the management plan development cell existed at the Department Level. As such, the above Sanctuaries were functioning on an *ad-hoc* basis during such time.

The Department assured in the exit conference (October 2022) that henceforth timely preparation of Management Plans would be ensured.

### 2.5.2 Absence of site specification in the Management Plans

The management plans of all the test-checked Sanctuaries had mentioned only various physical targets *vis-a-vis* generalised management prescriptions but did not contain site specific management prescriptions/ measures. The Management Plans had the provisions for creation of check dams, *van talavadi* (Forest ponds), boundary cairns, etc. However, the specific locations where these were required to be constructed were not mentioned in the Management Plans. The site specific prescriptions, i.e. the specific location in the Sanctuary area where management prescriptions were to be applied would have assisted in keeping a trail of the progress made in implementation of these prescription.

The Department assured (October 2022) that henceforth the Plan writing officer would be instructed to include coordinates of the proposed activities for ensuring site specifications.

### 2.5.3 Lack of uniformity in the Management Plans of various Sanctuaries

The Management Plans of the six test-checked Sanctuaries had different management prescriptions regarding mid-term and final review of the Management Plans, control forms and their formats, maintenance of compartment history and its format, maintenance of PA Book, etc. The issues relating to lack of uniformity of the Management Plans are discussed in the succeeding paragraphs.

#### 2.5.3.1 Mid-term evaluation of Management Plan

The WII Guidelines stipulate that every plan must include and prescribe the process of management review. The mid-term evaluation of the management plans provides an opportunity to the management to ascertain the impact of the prescriptions, identify the strategies which proved beneficial for the development of the Sanctuary and pinpoint the activities which could not yield the desired results. The outcome of the mid-term reviews can not only guide necessary interventions required in the on-going management plan but also prove helpful in the preparation of the next management plan.

Status of mid-term review of management plans relating to the six test-checked Sanctuaries is shown in the following table:

**Table 2.3: Status of Mid-term review of management plans as on 31 October 2022**

Name of Sanctuary	Balaram Ambaji	Jessore	Jambughoda	Ratanmahal	Shoolpaneshwar	Purna
Period of the management plan	April 2021-March 2031	April 2021-March 2031	April 2012-March 2022	April 2014-March 2024	April 2017-March 2027	April 2014-March 2024
Whether the Management Plan provided for Mid-term review	Yes	Yes	Yes (Partial)	No	Yes (partial)	Yes
Whether mid-term review was due and carried out	Not due	Not due	Due in 2017-18 but not conducted	No provision for review	Due in 2022-23 (Not conducted till date (October 2022))	Due in 2019-20 but not conducted

Source: Management Plan of the respective Sanctuary and information furnished by the Department.

Thus, the management plans were either silent on conduct of mid-term review or did not provide for full-fledged mid-term review. It is also pertinent to mention that in places where the mid-term review was provided for and due to be conducted, it was not conducted.

### 2.5.3.2 Control Forms/ Protected Area Books and Range Books/ Compartment History

The WII Guidelines provide for maintaining control form, PA Book/ corresponding Range Book and compartment<sup>4</sup> history. Control forms are meant to track management activities, record problems and their magnitude, and record events that are important from the management standpoint. The forms can be used as reference for annual reports, plan revision, management review and mid-course corrections. The PA Book (and the corresponding Range Book) is a means of tracking progress of management activities and records deviation proposals made and approved. Compartment history, which is prepared annually, is useful for evaluating habitat trends, natural and man induced impacts and efficiency of management prescriptions. The status of maintenance of these forms/ books/ history as observed during audit (July to October 2021) are given in **Appendix I**.

It can be seen from **Appendix I** that Control forms, PA Book and Range Books were not maintained in any of the six test checked Sanctuaries. It can be further seen that Compartment history was not maintained in four out of six test-checked Sanctuaries (even though provided for in their Management Plans). The compartment history in respect of Shoolpaneshwar and Purna Sanctuaries was not furnished during field visit (August/ September 2021). Majority of the sample copies of compartment history of some compartments furnished subsequently (November 2021 and February 2022) lacked date and signature of responsible authorities. In Purna, the compartment history was being maintained from 2020-21 only. Moreover, compartment history was not being maintained in formats prescribed in the WII Guidelines and thus, lacked some of the essential details like physical infrastructure, operations, and various events, etc., limiting their utility.

Thus, due to absence of these records, it was not possible for the management to track activities, record problems and their magnitude, activities deferred and record important events which could serve as reference at the time of the revision of plan or for mid-course corrections in the on-going plan.

## 2.6 Management Effective Evaluation (MEE) *vis-à-vis* Management Plans

MoEF&CC (with the technical assistance from WII) initiated the process of Management Effectiveness Evaluation (MEE) of the network of NPs and Sanctuaries in India in 2006. During MEE, the WII team assessed performance of respective PAs against the 30 Headline indicators and completed the MEE Score Card. The Report on 'Management Effectiveness Evaluation (MEE<sup>5</sup>) of NPs and Wildlife Sanctuaries in India' by WII assesses the effectiveness of PA management and covers (i) design issues (relating to both individual sites and PA systems), (ii) adequacy and appropriateness of management systems and processes and (iii) delivery of the objectives of PAs, including conservation of

<sup>4</sup> Compartment is the Smallest unit of management delineated on the ground and recorded on maps.

<sup>5</sup> The methodology for MEE is based on the uniform theme provided by the International Union for Conservation of Nature (IUCN), World Commission on Protected Areas (WCPA) Framework for Assessing the Management Effectiveness of Protected Areas.

values. It also highlights management strengths, weaknesses, and actionable points in relation to management of PAs by identifying critical issues like capacity building, preparation of management plans, providing adequate resources, building collaboration with stakeholders and strengthening eco-development programmes, etc. All the six Sanctuaries test-checked in Audit were covered under the MEE and their respective scores are given in the table below:

**Table 2.4: MEE scores of the test checked Sanctuaries**

Name of the Sanctuary	MEE Report Period/ Published in year	MEE Rank/ Category	MEE Score	Mean Percentage (Western <sup>6</sup> )	Mean Percentage (National)	Status as regards to Western Average	Status as regards to National Average
Balaram Ambaji	2015-17/ 2017	Good	60	66.17	62	Below	Below
Jessore	2017-18/ 2019	Fair	57.76	62.60	58.03	Below	Below
Jambughoda	2017-18/ 2019	Good	66.67	62.60	58.03	Above	Above
Ratanmahal	2018-19/ 2020	Good	72.50	64.22	62.01	Above	Above
Shoolpaneshwar	2006-14/ 2015	Fair	49.24	58.90	60.80	Below	Below
Purna	2006-14/ 2015	Good	64.17	58.90	60.80	Above	Above

Source: MEE Reports for the respective period.

From the above table it can be seen that three out of the six test-checked Sanctuaries fared below the National as well as the Regional (Western Region) average in terms of MEE scores. This indicates need for taking urgent steps and course correction to improve the management of these PAs.

NWAP-2 (2002-16) and NWAP-3 (2017-31) stipulate that findings of MEE reports should be kept in view for improving the management of the PA. Audit requested (between March and September 2021) the PCCF (WL) and jurisdictional Divisions to furnish action taken notes on the recommendations made in MEE reports. However, the same were not furnished to Audit. Moreover, Audit did not notice any reference to the MEE reports in preparation of management plans.

Thus, the Department did not utilise the results of MEE during preparation and execution of the Management Plans of the test-checked Sanctuaries.

<sup>6</sup> Comprising of the States/ UTs of Gujarat, Lakshadweep, Madhya Pradesh, Maharashtra, Rajasthan and Dadra and Nagar Haveli.

The Department stated (November 2022) that actions as prescribed in the MEE Reports have been taken/ are under progress in respect of the Balaram Ambaji and Jessore Sanctuaries. No reply was furnished in respect of the remaining four Sanctuaries. Moreover, reply was silent on consideration of MEE findings in the Management Plan of the respective Sanctuaries.

## **2.7 Funds for execution of activities envisaged in Management Plan**

The Management Plan of a Sanctuary lays down the items/ activities<sup>7</sup> to be conducted during the plan period of 10 years with details of year-wise physical targets and financial resources needed for the same.

Audit observations on availability of funds under Centrally Sponsored Scheme (CSS) and execution of activities envisaged in management plan are discussed in the succeeding paragraphs.

### **2.7.1 Linkage between funds allocated and activities envisaged under Management Plan**

Audit observed (June to October 2021) that jurisdictional Divisions did not maintain activity-wise physical and financial achievement against the targets envisaged in the management plans. Audit observed that the Divisions had maintained consolidated monthly expenditure report for all activities undertaken for the whole division without any linkage with activity-wise details prescribed in the Management Plan. Therefore, the Divisions were not in a position to furnish the details of accomplishment of physical targets prescribed in the management plans of their respective Sanctuaries and expenditure incurred thereupon. This indicated that monitoring of management plan was not holistic and the objective of preparation of management plan could not be fully achieved.

During the exit conference (October 2022), the Department stated that henceforth a format would be prescribed for ensuring linkage between funds allocated and activities envisaged in the Management Plan. It was further assured that activity-wise details would be mentioned against the funds released.

### **2.7.2 Availability of funds under Centrally Sponsored Scheme (CSS)-Integrated Development of Wildlife Habitats**

In addition to the State Schemes, the Department also receives funds under the Centrally Sponsored Scheme (CSS)-Integrated Development of Wildlife Habitats (IDWH). This scheme provides for Sanctuary-wise grants on 60:40 funding pattern for conducting wildlife protection and conservation activities. The funds under CSS-IDWH are sanctioned by the Central Government based on the proposals made in the Annual Plan of Operations (APO) of the respective Sanctuaries submitted by the State Government.

---

<sup>7</sup> like demarcation, Fire Protection, habitat Improvement like conservation of soil and water, improvement of water regime, improvement of food, fodder development, raising fruit tree species etc., protection against grazing, Eco-Tourism, Eco-Development, research, captive breeding program, protection measures like check post, Staff amenities, communication and weapons.

Audit observed short release and non-availment of CSS funds amounting to ₹ 4.70 crore as discussed in the succeeding paragraphs.

### 2.7.2.1 Short release of IDWH funds of ₹ 2.18 crore to the six Sanctuaries during 2016-17 to 2018-19

In respect of the six test checked Sanctuaries, for the APOs submitted during 2016-19, the amounts sanctioned by MoEF&CC with corresponding Central and State shares were as under:

**Table 2.5: Details of amount sanctioned under CSS-IDWH for 2016-2019**

(₹ in crore)			
Year	Total amount	Central share	State share
2016-17	2.90	1.74	1.16
2017-18	8.10	4.86	3.24
2018-19	1.58	0.95	0.63
<b>Total</b>	<b>12.58</b>	<b>7.55</b>	<b>5.03</b>

Source: Information from divisional records.

MoEF&CC released 80 per cent of the Central share as first installment. In addition, during 2016-17, MoEF&CC released ₹ 68.83 lakh as flexi fund for the combined APO of 26 PAs of Gujarat. Out of ₹ 68.83 lakh flexi fund, the Forest Department approved ₹ 15.50 lakh for the six test-checked Sanctuaries. The funds required to be released *vis-à-vis* actual release to the six test-checked Sanctuaries during 2016-19 is tabulated below.

**Table 2.6: Details of amount released under CSS-IDWH for 2016-2019**

(₹ in crore)					
Year	Central share (80 per cent of Column 3 table 2.5)	Matching share of the State Government	Total funds required to be released to the Sanctuary	Actual release by State including central share	Short release
2016-17	1.55 <sup>8</sup>	0.93	2.48	1.98	0.50
2017-18	3.89	2.59	6.48	5.05	1.43
2018-19	0.76	0.51	1.27	1.02	0.25
<b>Total</b>	<b>6.20</b>	<b>4.03</b>	<b>10.23</b>	<b>8.05</b>	<b>2.18</b>

Source: Information from divisional records.

Thus, there was short release of ₹ 2.18 crore to the six Sanctuaries during 2016-19.

### 2.7.2.2 Non-availment of second installment under IDWH funds of ₹ 2.52 crore to the six Sanctuaries during 2016-17 to 2018-19

As per the CSS-IDWH, the second installment<sup>9</sup> of ₹ 1.51 crore were to be released by the MoEF&CC on submission of Utilization Certificates (UCs) and supporting expenditure statements in respect of 60 per cent of the funds released under first installment (including matching State share). However, neither the

<sup>8</sup> 1<sup>st</sup> installment: ₹ 1.39 crore+ Flexi fund: ₹ 0.16 crore.

<sup>9</sup> ₹ 34.87 lakh, ₹ 97.19 lakh, and ₹ 19.01 lakh for the years 2016-17, 2017-18 and 2018-19, respectively (being the remaining 20 per cent of IDWH funds).

State Government allocated full amount of the first installment of central share and matching State share, nor did it send the UCs along with supporting expenditure statements to the MoEF&CC. Therefore, the MoEF&CC did not release the second installment aggregating to ₹ 1.51 crore in these three years. Consequently, State share of ₹ 1.01 crore was also not released as the second installment in these three years. Thus, the Sanctuaries were deprived of the second installment amounting to ₹ 2.52 crore during 2016-19.

***Recommendation 3: Funds released by the Central Government along with the stipulated State share may be promptly allocated to the protected areas and UCs may be submitted to the MoEF&CC as per the prescribed conditions.***





## CHAPTER-III

### Territorial integrity of the Sanctuaries, ESZ and Wildlife Corridors

#### *A Snapshot*

*Issuance of final notification under Section 26A of the WPA for substantial area falling under Balaram Ambaji and Jessore Sanctuaries was still pending. There were deficiencies in the demarcation of Sanctuaries, demarcation records were not maintained properly and inspections were not adequate for avoiding encroachment of Sanctuary areas. Despite the provisions of the Forests Rights Act (FRA), which stipulates that no fresh land could be brought under use (including cultivation) after 2005, fresh areas were being cleared for cultivation.*

*Lack of proper planning, coordination, and follow-up with the neighbouring State Authorities regarding mutual consultations on ESZ, resulted in 'zero km' ESZ in Balaram Ambaji, Ratanmahal and Shoolpaneshwar Sanctuaries while ESZ on interstate border remained inadequate in Jessore Sanctuary. In the absence of a systematic approach for timely preparation of Zonal Master Plan (ZMP), the ZMPs in respect of the five Sanctuaries remained incomplete even after lapse of 12 months to 94 months since the stipulated dates of their formation. As such, the notification of ESZ did not serve the purpose of regulating development activities inside the respective ESZ.*

*The Department neither conducted any study itself to identify the precise corridors nor took cognizance of the findings of the scientific study conducted by ISRO for recognizing, protecting, and developing these wildlife corridors. The identified corridors were not included fully in the notified ESZ of Balaram Ambaji and Jessore Sanctuaries. There was need of dedicated plan for proper management of already identified corridors.*

#### **Introduction**

Protected Areas (PAs) are well defined geographical spaces, recognized, dedicated, and managed through legal and other effective means to achieve the long-term conservation of nature. Eco-Sensitive Zones (ESZs) are areas notified by the MoEFCC around the National Parks and Wildlife Sanctuaries. The purpose of declaring ESZ is to create a 'Shock Absorber'/'transition zone' for the PAs by regulating and managing the activities around such protected areas. They would also act as a transition zone from areas of high protection to areas involving lesser protection. As per NWAP, Eco Sensitive Zone status under the Environment (Protection) Act, 1986, should be used as a tool to strengthen the buffers and corridors around the PA.

Wildlife habitats are becoming increasingly fragmented due to anthropogenic activities. Corridors help to reduce or moderate some of the adverse effects of

habitat fragmentation by facilitating dispersal of wildlife between habitats allowing for both long-term genetic interchange and to re-colonize habitat patches from where wildlife have become locally extinct.

The issues regarding final notification of Sanctuaries and ESZs, maintenance of territorial integrity of Sanctuaries and the formulation of Zonal Master Plans for regulation of development in ESZ have been discussed in the subsequent paragraphs.

### 3.1 Legal status of Jessore and Balaram Ambaji Sanctuary and settlement of rights and privileges

Clearly defined boundaries and legal status of the PAs would help in effective protection of the wildlife. This in turn would ensure long term conservation and reduce conflicts with local communities and thereby help PA managers in effective discharge of their protection and conservation functions.

As per Section 26A of the Wildlife (Protection) Act, 1972 (WPA) (as amended in 1991), the State Government is empowered to declare an area as ‘Sanctuary’ after completion of procedure as contained in Sections 18 to 25 of the Act. Further, Section 66(4) of the Act provides that where any proceedings under Sections 19 to 25 are pending on the date of commencement of amendment Act (1991), any Reserve Forest or part of territorial waters declared under Section 18 shall be deemed to be Sanctuary. Thus, issuance of Notification under Section 26A of the WPA is essential to give legal status to areas other than Reserve Forest and territorial waters as a Sanctuary.

Audit observed that all the six test-checked Sanctuaries had been notified under Section 18 of the WPA prior to 1991. It was further observed that four out of the six test-checked Sanctuaries<sup>1</sup> comprised fully of Reserved Forests. However, Jessore and Balaram Ambaji Sanctuaries comprised of land other than the reserve forest as shown in table below:

**Table 3.1: Land composition of Jessore and Balaram Ambaji Sanctuaries as on September 2021**

S. No.	Name of the Sanctuary	Year of notification of Sanctuary	Total Area of the Sanctuary (in Ha)	Area of Reserve Forest (in Ha)	Percentage of reserve forest w.r.t. total area of Sanctuary
1	Jessore	1978	18,066.29	3,669.71	20.31
2	Balaram Ambaji	1989	54,478.39	20,964.57	38.48

Source: Information provided by the Department.

Hence, as per provisions mentioned above, except the reserve forest notified as Sanctuary prior to 1991, which comprised only 20.31 and 38.48 *per cent* of the Jessore and Balaram Ambaji Sanctuaries respectively; the remaining area of these two Sanctuaries cannot be deemed as Sanctuary as per Section 66(4) of the WPA. Audit observed that even in the Management Plans of the two

<sup>1</sup> Jambughoda, Ratanmahal, Shoolpaneshwar and Purna Sanctuaries.

Sanctuaries for the period 2021-22 to 2030-31 it is mentioned that though this area has been declared as PA, settlement process under WPA was still awaited. Thus, the final notification under Section 26A of the WPA was still pending and 79.69 and 61.52 *per cent* of the area respectively falling under these two Sanctuaries still lacked legal status (November 2022).

PCCF (WL) replied (March 2021) that there were 18 enclaved villages in Jessore and 86 enclaved villages in Balaram Ambaji and Collector, Banaskantha has been appointed (March 1993) as the Settlement Officer. However, rights and privileges had not yet been settled in any of these enclaved villages.

Audit noticed that the Settlement Officer had submitted his report on rights and privileges in May 2000, however, the F&ED was yet to approve the report (October 2022). The Department did not furnish any reasons for not approving the report of the Settlement Officer even after passage of more than 22 years since its submission.

Thus, due to non-issuing of final notification under Section 26A of the WPA, these two Sanctuaries lacked legal status which was detrimental to the conservation and management activities of wildlife and its habitat. This was established from the fact that the Hon'ble Gujarat High Court in its decision (June 2014) did not acknowledge the part of Balaram Ambaji Sanctuary outside the reserve forest as Sanctuary, for want of compliance to the provisions of Section 19 to 25 of the WPA. Consequently, the High Court refused to put restrictions on mining within one km of the boundary of the Sanctuary<sup>2</sup>.

The Department stated (November 2022) that the proposal for final notification, as per the applicable Guidelines and instructions, would be sent to the Government.

***Recommendation 4: The Department may complete the process of settlement and final notification for Balaram Ambaji and Jessore Sanctuaries in a time-bound manner.***

### **3.2 Difference in notified area *vis-à-vis* area as per study report**

The notification of the Protected Area and the Eco Sensitive Zones around it specifies the details of the villages/ taluka/ District included in such PA/ ESZ and also its total geographical coverage area.

An analysis of the Land Use Land Cover<sup>3</sup> *vis-à-vis* notifications for Sanctuary/ ESZ, revealed that the GIS based area of the Sanctuary and its ESZ (calculated at the instance of Audit by Space Application Centre (SAC) Ahmedabad) was less than the notified areas in respect of three out of the six test-checked

<sup>2</sup> except the area located within one km of the boundary of reserve forest (part of the Sanctuary), deemed to be a Sanctuary declared under Section 26A within the meaning of Section 66(4) of the WPA.

<sup>3</sup>The LULC analysis involved analysis of satellite imageries and field verifications. The ESZ boundary layers were obtained from the Forest Department. Suitable datasets from Landsat satellites (*The Landsat Program is a series of Earth-observing satellite missions jointly managed by National Aeronautics and Space Administration (NASA) and the United States Geological Survey. Landsat satellites track land use and document land change due to natural and human-caused changes*) were selected for decadal time frames i.e. 1980, 2000 and 2020. The datasets were downloaded from various repositories using Google Earth Engine (GEE). Area statistics were computed and field visits were performed to remove the ambiguities and to ascertain the purity of classes of land use/ cover. Collateral datasets (Forest Survey of India maps and vegetation type maps) were also referred to resolve the categorization issues of the classes.

Sanctuaries. The difference ranged between seven to 19 per cent, as detailed in the following table:

**Table 3.2: Notified area vis-à-vis area arrived at during the Land Use and Land Cover analysis**  
(Area in Sq. Km.)

Name of the Sanctuary	Notified ESZ Area	Notified area of Sanctuary	Total notified area	Area as per Land Use and Land Cover study report (Sanctuary and ESZ)	Difference (in per cent)
Ratanmahal	241.5	55.65	297.15	241.31	(-) 18.79
Jambughoda	269.69	130.38	400.07	355.98	(-) 11.02
Shoolpaneshwar	545.20	607.70	1,152.91	1,069.57	(-) 7.23

Source: Notifications in respect of Sanctuary and ESZ and SAC study report.

Thus, the actual area available for wildlife was less as compared to the notified area. This may lead to conflict between locals and the Department due to difference of perception regarding extent of Sanctuary/ ESZ, which might adversely affect the planning and implementation efforts for protection, conservation and management of the respective Sanctuary/ ESZ. The Department is required to reconcile the difference in area actually available for better management of the Sanctuary/ ESZ.

The Department stated (November 2022) that matter has been reported to the Government.

### 3.3 Alteration in Sanctuary area/ map of wildlife Sanctuary

Section 20 of the Indian Forest Act (IFA), 1927 empowers the State Government to notify an area as a Reserved Forest (RF). However, any RF may cease to be so, by notification of the State Government under Section 27 after getting prior approval of the Central Government. Further, the WPA empowers the State Government to notify an area as a Sanctuary. However, the power to alter the boundary of a Sanctuary has been expressly reserved with the National Board of Wildlife (NBWL).

- In exercise of powers conferred under Section 20 of the IFA, GoG declared (1965/ 1969) 6,048.87 Ha area of 11 villages of Limkheda Taluka of Panchmahal district as RF. Subsequently, out of this, the State Government declared (April 1982) 5,565.13 Ha, as Ratanmahal Wildlife Sanctuary under Section 18 of the WPA.

Audit observed that an area of 122.08 Ha of RF was being shown as deleted from notified RF in village form<sup>4</sup> number 1 maintained by the jurisdictional division. However, notification of area ceasing to be RF was issued in 1996 for only 89.46 Ha. On being requested (August 2021), the Department could not furnish any notification regarding exclusion of remaining area of 32.62 Ha from RF. Thus, 32.62 Ha was being shown as deleted from the notified RF in village form number 1 without requisite notification under

<sup>4</sup> Division maintains a village form no. 1, which reflects the village wise area declared as forest and details of area ceased to be forest, if any.

FCA. Moreover, the above area of 122.08 Ha was also excluded from the map of the Sanctuary, without prior approval of the NBWL. As such, this area was not being protected and conserved in terms of FCA and WPA.

The Department stated (November 2022) that area of 30.50 Ha has been given to the Irrigation Department while 2.12 Ha has been given to villagers under FRA (for cultivation purpose).

The reply of the Department confirmed that reserve forest area and map of the Sanctuary were altered without approval of the competent authority.

- Audit also observed that forest area of 518.93 Ha of three villages<sup>5</sup> which were part of Shoolpaneshwar Sanctuary, was shown as non-Sanctuary area in the Map forming part of the final ESZ notification of the Sanctuary.

Since the field staff of the Department rely on map of the Sanctuary for their day-to-day functions, discrepancies in the map may impact conservation efforts.

The Department stated (November 2022) that the matter had been reported to the State Government.

### 3.4 Boundary Demarcation and Digitisation of Sanctuaries

In the absence of a clear boundary demarcation, the field staff of forest division finds it difficult to protect the forest/ Sanctuary land from encroachment. This may result in conflicts with local population and pose a threat to the wildlife habitats due to encroachment. Encroachment in the peripheral forests can be avoided by proper survey, demarcation, erection of boundary cairns and stone/ rubble wall fencing on the boundary.

Out of six test-checked Sanctuaries, five Sanctuaries (except Purna Sanctuary) are highly fragmented, which makes them vulnerable to encroachment in the absence of proper demarcation on ground. The Management Plans of these Sanctuaries acknowledge improper demarcation on ground, poor maintenance of boundary register, lack of settlement of rights and privileges of locals, encroachment, and consequent need for proper demarcation on ground as well as on map and its periodical checking.

Audit observed that instruction issued (July 2016) by the PCCF (WL) regarding checking/ ascertaining the exact forest boundaries (which has changed due to several reasons including implementation of FRA), recording of GPS coordinates and its annual reporting to appropriate authorities was not being adhered to. As such, the boundaries of the Sanctuaries were not being monitored to ensure their inviolability in order to avoid conflict with local populace. Demarcation registers were either not being maintained properly or were not updated on regular basis. Further, the Department had not developed any GIS based decision support database even after lapse of 10 years since

<sup>5</sup> Babadokti (203.49 Ha), Govalpatadi (154.38 Ha) and Ambagam (161.06 Ha).

pronouncement (July 2011) of guidelines in this regard by the Hon'ble Supreme Court of India.

The details of deficiencies observed by Audit in the demarcation, maintenance of records and lack of periodical inspections have been mentioned in **Appendix II**.

Absence of proper demarcation, digitisation and periodical monitoring of the boundaries makes the Sanctuaries susceptible to encroachment.

During the exit conference (October 2022) the Department informed that separate boundary demarcation registers have been maintained for forest and Sanctuary area. The Department also assured that jurisdictional DCFs would henceforth comply with the instructions issued regarding demarcation and inspection of boundary.

The Department also stated (November 2022) that digitisation of boundaries had been initiated in respect of three Sanctuaries namely Shoolpaneshwar, Purna and Jambughoda and assured to update the demarcation register in respect of Purna Sanctuary.

### **3.5 Rights of persons *vis-à-vis* conservation of wildlife and its habitats**

#### **3.5.1 Survey and demarcation around areas where cultivation rights have been recognised**

The Scheduled Tribes (STs) and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 (FRA) provides for certain rights to forest dwellers which secure individual or community tenure or both on fulfillment of certain prescribed conditions. The individual or community rights are determined by following a due procedure which includes passing of resolution by the Gram Sabha and filing of petition before Sub-divisional level and District level committees, in case of any grievances. Further, the FRA stipulates that recognition of rights was subject to the condition that the forest land has been occupied prior to 13<sup>th</sup> December 2005 *i.e.* no fresh land could be brought under use (including cultivation) after 2005.

Audit observed that the management plans of the test-checked Sanctuaries (except for Shoolpaneshwar) did not have prescriptions regarding survey and construction of pillars around the areas where cultivation rights are recognized under the FRA. Further, no mechanism was established in any of the test-checked Sanctuaries for ground proofing of the area where rights were given for cultivation under FRA.

##### **3.5.1.1 Cultivation inside the Sanctuary area**

The SAC in its Land Use and Land Cover (LULC) analysis<sup>6</sup> brought out the increasing trend in agriculture and decreasing trend in moderate dense forest,

---

<sup>6</sup> conducted for the six test-checked Sanctuaries and its surrounding areas for the period 1980-2020.

open forest and degraded forest in Ratanmahal and Purna Sanctuaries. The LULC analysis concluded that there was increase in agriculture areas (ranging from 28 to 33 *per cent*) during 1980 to 2020. Similar trend in respect of agriculture/ moderate dense forest/ open forest were observed in Shoolpaneshwar except for the increase in degraded forest. The maps showing trend of increasing agriculture in Shoolpaneshwar Sanctuary are shown in **Appendix III**.

Audit conducted joint site visit of the Sanctuaries with jurisdictional Range Forest Officers/ Foresters. During the site visit, cultivation was observed (September 2021) in Sagai, Fulsar and Gora Ranges of Shoolpaneshwar Sanctuary and Bardipada Range of Purna Sanctuary. However, it was observed that there was no demarcation/ signage/ rubble wall/ boundary cairns erected between the area where the cultivation rights were given to villagers *vis-à-vis* the Sanctuary area, which could function as a deterrence to encroachment or unauthorised cultivation. The requirement of such demarcation was also highlighted by PCCF (WL) in the instructions issued in July 2016 to prevent encroachment and ascertain the ground position of the sanctuary area.

It was further observed that in Purna Sanctuary, along the Kalibel-Mahal road, fresh area was being cleared. Trees/ tree branches had been cut and were being used for creating boundaries and huts under construction.



**Photograph 3.1: Fresh area cleared for cultivation in the Purna Sanctuary along the Kalibel-Mahal road (photograph taken on 21 September 2021)**

This was in violation of FRA and thus, highlighted the need to properly maintain the boundary pillars in the Sanctuary.

The Department stated (November 2022) that cultivation observed in Sagai and Fulsar range was being done by the holders of Certificate under FRA. In case of Purna Sanctuary it was informed that out of 239 claims settled under FRA, demarcation had been done in respect of 198 claims.

The reply of the Department is not convincing because LULC analysis as well as joint site visit established that fresh areas were being brought under cultivation even in the recent years, which was in violation of FRA. The reply regarding Purna Sanctuary confirmed the audit contention regarding non-demarcation of area under FRA *vis-à-vis* Sanctuary area.

***Recommendation 5: The Department may ensure proper demarcation of the boundaries of the Sanctuaries by constructing boundary pillars especially in areas where rights have been settled under the FRA.***



### **3.6 Eco-Sensitive Zones (ESZ)**

Eco-Sensitive Zones (ESZ) are declared by the MoEF&CC based on the proposal of the State Forest Department. The basic aim of creation of the ESZ is to create a kind of "shock absorber" by regulation of certain activities around National Parks and Wildlife Sanctuary so as to minimise the negative impacts of such activities on the fragile ecosystem encompassing the Protected Area. They also act as a transition zone from areas of high protection to areas involving lesser protection and also important for the animals moving out to other forests.

Declaration of ESZ is mandatory as per the decision taken (March 2005) by NBWL and order dated 4 December 2006 of the Supreme Court of India (SCI). The SCI re-established (June 2022) that each National Park or Wildlife Sanctuary must have an ESZ of minimum one kilometre measured from the demarcated boundary of such Protected Area.

The MoEF issued Guidelines for declaration of ESZ in February 2011 and asked the States to submit proposal for ESZ around Sanctuaries. Subsequently, MoEF decided (July 2013) that in respect of PAs where proposal for ESZ has not been submitted, a default area of 10 Km from the boundary of the PA would be deemed as ESZ, till ESZ is finally notified. Further, delineation of ESZ was supposed to be site specific and the activities in the ESZ were supposed to be of a regulatory nature rather than prohibitive nature. In case where sensitive corridors, connectivity, and ecologically important patches crucial for landscape linkage, are even beyond 10 Km width, these could be included in ESZ.

#### **3.6.1 Preparation of inventory of different land use patterns**

As per the ESZ Guidelines, the ESZ should be proposed by the State Government based on the inventory of different land use patterns, different types of activities and number of industries operating around each PA as well as important wildlife corridors.

Audit observed (between March and September 2021) that none of the four divisions, having jurisdiction over the six test-checked Sanctuaries, had prepared the inventory of the land use patterns, activities, and operative industries around the respective Sanctuary. In the absence of such inventory, the activities within the notified ESZ area could not be regulated. Moreover, some of the important corridors were not fully included in the ESZ as discussed in paragraph 3.9.

The Department confirmed (November 2022) that inventory of the land use patterns was not prepared in any of the six Sanctuaries.

### **3.7 Mutual consultations with neighbouring States regarding formation of ESZ**

The purpose of declaration of ESZ is regulation of human activities around the PA. For these the human activities are categorised into prohibited, regulated and permitted. As per Guidelines of February 2011, for declaration of ESZ around

National Parks and Wildlife Sanctuaries in cases where the boundary of a PA abuts the boundary of another State where it does not form part of any PA, it shall be the endeavour of both the States to have mutual consultations and decide upon the ESZ around the PA in question.

Out of six test checked Sanctuaries, four Sanctuaries share boundaries with other States, as shown below:

**Table 3.3: Details of inter-State boundaries of the Sanctuaries**

Sl. No.	Name of the Sanctuary	Neighbouring State	Perimeter of the Sanctuary (Km)	Perimeter of the Sanctuary forming boundary with the other State (Km)
1	Balaram Ambaji	Rajasthan	703	21.50
2	Jessore	Rajasthan	222	31
3	Ratanmahal	Madhya Pradesh	64.83	21.21
4	Shoolpaneshwar	Maharashtra	269.95	43.50

Source: Information furnished by the Department.

MoEF&CC notified ESZs around the above four Sanctuaries between 2016 and 2021 on the basis of proposals made by the State Government. Audit observed that nothing was on record to establish that the neighbouring State authorities were consulted (except for Jessore<sup>7</sup>) before submission of proposals to the MoEF&CC for declaration of ESZ. Audit further observed that the proposals submitted to the MoEF&CC by the Department did not include ESZ at interstate boundaries. This resulted in '0' km ESZ at the interstate boundaries of above mentioned Sanctuaries.

The absence of ESZ on interstate boundaries defeated the very purpose of formation of ESZ to act as a shock absorber and to regulate certain activities around the PA, as such activities were not regulated on the other side of interstate boundary. Therefore, the objective of minimizing the negative impacts of activities, identified as prohibited and regulated in the Guidelines, on the fragile ecosystem could not be fully achieved.

The Department stated (November 2022) that in respect of Shoolpaneshwar Sanctuary coordination was made at district level whereas in respect of Jessore and Balaram Ambaji Sanctuaries the revenue areas of Rajasthan touches these two Sanctuaries and consultation with the neighbouring State was a national matter. No reply was furnished in respect of Ratanmahal Sanctuary.

The reply of the Department confirms that either no efforts were made to coordinate with the neighbouring States or coordination at appropriate level was not made. Thus, the lackadaisical approach of the Department resulted in ineffective ESZ at the inter-State boundaries of the four Sanctuaries.

<sup>7</sup> Though the discussion regarding extent of ESZ at interstate boundaries of Gujarat and Rajasthan was initiated in 2015, it did not come to a logical conclusion and the ESZ for Jessore was notified in 2017 with 'zero' km ESZ at interstate boundary with Rajasthan. Subsequently, the ESZ around Mount Abu Sanctuary in the State of Rajasthan was notified in November 2020 which included a stretch of only five Km out of the total 31 Km boundary of Jessore Sanctuary abutting the State of Rajasthan.

### 3.8 Preparation of Zonal Master Plan

As per the ESZ notifications issued by the MoEF&CC, the State Government shall prepare a Zonal Master Plan (ZMP) within a period of two years from the date of publication of the ESZ notification. ZMP regulates development in ESZs and serves as a reference document for the monitoring committee<sup>8</sup> for conducting its functions in accordance with the provisions of the ESZ notification. The details regarding preparation of ZMP of the ESZ of the six test-checked Sanctuaries and status thereof are depicted in the following table:

**Table 3.4: Details regarding preparation of ZMP for the notified ESZ of Sanctuaries as on 31 March 2022**

Name of the Sanctuary	Shoolpane shwar	Jessore	Ratanmah al	Jambughoda	Purna	Balaram Ambaji
Date of final notification of ESZ	05.05.2016	12.10.2017	29.01.2019	08.03.2019	31.05.2012	08.11.2021
Name of Agency entrusted for preparation of ZMP	GEER <sup>9</sup> Foundation	GEER Foundation	GEMI <sup>10</sup>	GEMI	GEER Foundation	HNGU <sup>11</sup>
Date of decision to allot work for preparation of ZMP	11.07.2017	18.06.2019	18.06.2019	18.06.2019	11.07.2017	24.08.2020
Time gap between final notification of ESZ and allotment of work of preparation of ZMP	14 months	20 months	04 months	03 months	61 months	Nil
Due date stipulated for preparation of ZMP	05.05.2018	12.10.2019	29.01.2021	08.03.2021	31.05.2014	08.11.2023
Status of preparation of ZMP as on March 2022	Not prepared	Not prepared	Not prepared	Not prepared	Not prepared	Not prepared
Delay in preparation of ZMP from the stipulated due date as of March 2022	46 months	29 months	14 months	12 months	94 months	Not applicable

Source: Departmental records and information furnished by the Department.

Audit observed that:

- No centralized mechanism was established for identifying and engaging agencies for preparation of ZMP as in one case the agency was decided at Circle level<sup>12</sup> and in the remaining five cases<sup>13</sup>, these were decided by PCCF (WL).

<sup>8</sup> Monitoring Committee consists of the District Collector as Chairperson and jurisdictional DCF as Member Secretary in addition to other members and is responsible for monitoring of the provisions of the ESZ notification.

<sup>9</sup> Gujarat Ecological Education and Research (GEER) Foundation is an autonomous body, set up by the Forests & Environment Department, Government of Gujarat.

<sup>10</sup> Gujarat Environment Management Institute (GEMI) is an autonomous Institute set up under the aegis of Forests & Environment Department, Government of Gujarat.

<sup>11</sup> Hemchandracharya North Gujarat University (HNGU) is a public university in Patan, Gujarat.

<sup>12</sup> Balaram Ambaji

<sup>13</sup> Jambughoda, Jessore, Purna, Ratanmahal, Shoolpaneshwar.

- In the case of Jessore and Purna Sanctuaries, the work of preparation of ZMPs was entrusted to an agency (GEER foundation) by PCCF(WL) after lapse of 20 months and 61 months respectively, from the date of final notification of the respective ESZ.
- The PCCF(WL) while assigning the work, neither executed any MoU/ ToR with these agencies nor fixed any timeline for submission of the ZMP. Due to non-fixation of definite timelines, the agencies did not complete the assigned work even after lapse of 33 months to 56 months since the assignment of work.
- No schedule of payment against the work assigned was formulated, however payments were released for preparation of ZMP in respect of four Sanctuaries. For ZMP of Jessore and Purna, the concerned Division Office released ₹ 15 lakh and ₹ five lakh respectively (May 2020) without any agreement/ estimation of cost provided by the agency. Against GEMI's demand (August 2019) of ₹ 34 lakh for Ratanmahal and ₹ 41 lakh for Jambughoda, the DCF, WL Division, Vadodara released (June 2020) a token amount of ₹ five lakh for each Sanctuary. No amount was released to GEER for Shoolpaneshwar due to want of funds.
- HNGU gave (July 2020) an estimate of ₹ 15.51 lakh which was valid for a period of 60 days with the condition of advance payment of 30 *per cent* of the estimate. This was not paid by the concerned Division as of September 2021. Thus, the validity of the bid lapsed and no progress on Balaram Ambaji ZMP was made (November 2022).

Thus, it can be concluded that the Department did not follow a systematic approach for engaging of agencies and ensuring timely preparation of ZMP and the ZMPs in respect of the five Sanctuaries remained incomplete even after lapse of 12 months to 94 months since the stipulated dates of their completion. Without ZMP, the notification of ESZ did not serve much purpose as no plans were in place for regulating activities in ESZ as envisaged in the notification.

The Department stated (November 2022) that work of preparation of ZMP in respect of the six Sanctuaries was under process.

***Recommendation 6: The State Government may ensure preparation and implementation of ZMP of the notified ESZs in a time bound manner for regulation of activities inside the respective ESZ.***

### **3.9 Wildlife Corridors and their Management**

The NWAP-2 (2002-16) prescribed undertaking of studies to identify vital ecological corridor, which must be protected. ESZ Guideline (2011) also state that corridors crucial for landscape linkage should be included in the ESZ.

#### **3.9.1 Jessore and Balaram Ambaji Sanctuaries**

The Working Plan (2017-18 to 2026-27) for the forests of Banaskantha Forest Division (Part-I) recognised the need of a corridor between Balaram Ambaji

and Jessore Sanctuaries. Details of area identified as corridor in the working plan *vis-à-vis* actual area notified in the ESZ are shown in the table below.

**Table 3.5: Area identified as corridor in working plan *vis-a-vis* its inclusion in the ESZ**

Name of Sanctuary	Area Identified as Corridor (in Ha) in the working plan		Area Actually notified under ESZ (in Ha)		Percentage of area notified under ESZ	
	Forest Area	Non-Forest Area	Forest Area	Non-Forest Area	Forest Area	Non-Forest Area
Jessore	235.60	1,321.04	127.96	495.05	54.31	37.47
Balaram Ambaji	2,057.57	1,639.79	1,082.14	698.74	52.59	42.61
	2,293.17	2,960.83	1,210.10	1,193.79	52.77	40.32

Source: Working Plan of Banaskantha Forest division for the period 2017-18 to 2026-27.

It can be seen from the table above that only 52.77 and 40.32 *per cent* out of the total identified forest and non-forest area, respectively were included as corridor in the ESZ notification. Thus, out of the total area of 5,254.00 Ha identified as Corridor, 2,850.11 Ha (54 *per cent*) was not included in the ESZ. Inclusion of the area, identified by the Department as corridor, in the ESZ would have facilitated better conservation and management efforts for wildlife.

### 3.9.2 Jambughoda Sanctuary

The identified corridor of the Sanctuary fell under the jurisdiction of Godhra Forest Division and Chhota Udepur Forest Division. While approving the management plan for Jambughoda Sanctuary (2012-22) it was decided (June 2012) to include the management prescriptions for corridor areas in the working plans of the above two mentioned divisions. However, Audit noticed that no plan for the corridor was included in the working plan of Chhota Udepur Forest Division for the period 2017-18 to 2026-27 (approved in January 2018) while working plan of Godhra Forest Division was yet to be prepared (November 2022). Thus, no arrangement existed for effective management of the identified corridor.

The Department stated (November 2022) that the identified corridors would be communicated to the Godhra and ChhotaUdepur Divisions for inclusion of suitable working plans.

### 3.9.3 Shoolpaneshwar Sanctuary

Shoolpaneshwar Sanctuary comprising of 607.71 Sq.km area, is surrounded by 565.90 Sq. km of Reserve Forest under Narmada Forest Division. Audit observed that even though the broad potential areas for wildlife corridor had been identified in the management plan and working plan of the Sanctuary/ forest division, the Working Plan Officer (WPO) did not identify the precise wildlife corridor on ground for inclusion in the working plan of the Narmada Forest Division for the year 2017-18 to 2026-27.

The Department stated (November 2022) that corridors in the Sanctuary would be identified and included in the working plan and management plan.

#### 3.9.4 Purna Sanctuary

The Management Plan of Purna Sanctuary for the period 2002-11 had identified 15 Km stretch of dense forest between the Sanctuary and Vansda National Park (VNP) as a potential corridor. Even the Management Plan (2014-15 to 2023-24) of VNP identified an area of 8,294.49 Ha between the VNP and Purna Sanctuary as a wildlife corridor.

Audit observed (September 2021) that ESZ for the Purna Sanctuary extended up to only two Km towards the VNP while the ESZ for the VNP is zero Km towards Purna Sanctuary. As such, the Department did not protect the corridor by including the whole identified stretch under the notified ESZ. Further, types of management initiatives required to operate in corridors had not been defined in the management plans in either of the protected areas. Though, the PCCF (WL) instructed (February 2016) the concerned Divisions to take necessary initiatives to make the proposed corridor operational and protected, no action plan for the corridor had been submitted to PCCF(WL) by the concerned Divisions till date (November 2022).

The Department stated (November 2022) that process for preparation of separate corridor management plan had been initiated in collaboration with Forestry College, Navsari.

#### 3.9.5 Corridors identified by ISRO

A study on 'Habitat Suitability & Corridor analysis for Sloth Bear in Gujarat using Remote Sensing and Ecological Modelling' was conducted (September 2014 to December 2017) by Dr. Nishith Dharaiya<sup>14</sup>, Associate Professor, Hemchandracharya North Gujarat University, Patan in collaboration with Space Application Centre (SAC), Ahmedabad of Indian Space Research Organization (ISRO). The study report *inter-alia* identified 12 wildlife corridors and shared it with the Department. The study report also recommended for habitat improvement in the potential corridors. The details of the corridors identified in the study report are as mentioned below:

---

<sup>14</sup> Dr Nishith Dharaiya is a member of State Board for Wildlife; Co-Chair, IUCN-Species Survival Commission (SSC) Sloth Bear Expert Team; Member, IUCN-SSC Human-Bear Conflict Expert Team. He has contributed in IUCN red list assessment for Sloth bear and coordinated State-wide sloth bear population estimation in Gujarat. He has also authored the Bear Conservation Action Plan for Gujarat.

**Table 3.6: Corridors identified by the ISRO study report**

Sl. No.	Area where corridor identified	Number of corridors identified by ISRO	Number of corridors identified by the Department
1	Between Balam Ambaji and Jessore	2 (one portion along Banas River & one along Balam River)	1 (along Balam River)
2	Between Balam Ambaji and polo forest in Vijayanagar	3	0
3	Forest of Sabarkantha, Aravalli and Chhota Udepur	3	0
4	Among Ratanmahal, Jambughoda and Shoolpaneshwar Sanctuaries	3	1 (Between Ratanmahal and Jambughoda Sanctuaries)
5	Shoolpaneshwar and forest of Narmada and Tapi districts	1	0

Source: ISRO study on “Habitat Suitability & Corridor analysis for Sloth Bear in Gujarat using Remote Sensing and Ecological Modelling.”

Audit observed (November 2021) that though prescribed under NWAP-2 (2002-2016), the Department neither conducted any study by itself to identify the corridors nor took cognizance of the findings of the scientific study conducted by ISRO for recognizing, protecting, and developing the wildlife corridors (September 2021). As such, out of the 12 corridors identified by ISRO, the Department recognised only two wildlife corridors. Further, the Department was yet to delineate these two identified corridors on the ground and formulate management strategies for these corridors (November 2021).

The Department stated (November 2022) that in the corridor identified by ISRO along Banas River (in Jessore and Balam Ambaji Sanctuaries), removal of invasive species, plantation of fruit trees and drinking water facility have been executed for management of the corridor. However, the Department did not furnish any response regarding not recognizing/ formulating management strategies in respect of the 10 (out of the 12) corridors identified by ISRO.

***Recommendation 7: The corridors between the protected areas and other surrounding forests/ protected areas may be identified and plan for their management may be included in the Management/ Working Plan of respective Divisions.***

## CHAPTER-IV

### Research and Conservation Efforts for Flora/ Fauna

#### *A Snapshot*

*The Department had not prepared a consolidated State Wildlife Research Plan. There was lack of research activities and proper mechanism for ensuring timely submission of research findings to the State Authorities/ WII was yet to be established.*

*The Sanctuaries were invaded by invasive alien species. However, despite having management prescription regarding control of invasive species, fodder plantation, natural regeneration and plantation activity, its execution was not satisfactory in the test-checked Sanctuaries.*

*The Department did not conduct in-depth analysis of the estimated wildlife in terms of survival ratio/ pattern, seasonal patterns of movement, basic migratory routes and areas of high species density and diversity, etc. Special efforts were required for reintroduction/ conservation of the locally extinct species. However, measures taken by the test-checked Sanctuaries to stabilize/ improve such species were not commensurate with the requirements for conservation. Breeding Centre was required to be established at Jambughoda Sanctuary and the Centres in Ratanmahal and Shoolpaneshwar Sanctuaries were to be operationalised/ utilised as per the needs identified. Despite instances of human-wildlife conflicts; the Sanctuaries were not equipped to deal with such conflicts both in terms of human resources and equipment. Honorary Wildlife Wardens (HWW) were not being appointed on regular basis.*

#### **Introduction**

Wildlife conservation refers to the protection, care, management and maintenance of ecosystems, habitats, wildlife species and populations, within or outside of their natural environments, in order to safeguard the natural conditions for their long-term permanence.

#### **4.1 Research**

Scientific Research is the backbone of conservation of wildlife and is crucial for better understanding of ecosystems, their functions, ecological status, threat perceptions of various species and their habitats. Research also helps in generating baseline information against which impacts of conservation and management efforts undertaken can be monitored which in-turn will help the field managers in taking appropriate actions.

##### **4.1.1 State Wildlife Research Plan**

NWAP-2 (2002-16) prescribes that each PA manager shall prepare research priorities for respective PA, which shall then be consolidated in a State Wildlife



Research Plan to be prepared every five years by the State Forest Department. The preparation of the first plan was to start in 2002 and was expected to be completed by 2004. NWAP-3 (2017-31) also provided for continued research/ studies to ascertain impact of developmental activities on wildlife habitats. Audit observed that the Department did not prepare Gujarat State Wildlife Research Plan till date (October 2022).

A State wildlife research plan would have ensured research in the identified areas for better habitat management and conservation and protection of wildlife.

#### **4.1.2 Status of research**

National Working Plan Code<sup>1</sup> 2014 stipulates that reference should be made to all research articles/ outputs/ findings during the preparation of the working plan. It also requires that while writing the working plan, all research gaps and challenges with respect to availability of data should be brought out clearly.

The Management Plans of the Sanctuaries identified various challenges such as poor and meaningless research; absence of systematic and scientific data, etc. Audit noticed that the Management Plans of the Sanctuaries and the working plans of the forests surrounding the Sanctuaries referred to research articles/ outputs/ findings published more than a decade ago which indicated lack of availability of current research. Audit noticed that 119 topics had been identified in the management plans of the six test-checked Sanctuaries. These included important research topics like reintroduction of locally extinct species, population study of various species, carrying capacity and appropriate interventions for formulation of eco-tourism plans etc. Research on these identified areas could be of immense use for better management of these Sanctuaries. However, in the test-checked Sanctuaries, no research was conducted in last 10 years (2010-11 to 2020-21).

The Department stated (November 2022) that research topics were being communicated to the Gujarat Forestry Research Foundation (GFRF) by the respective Sanctuaries. The Department further stated that research was being done by Gujarat Ecological Education and Research (GEER) Foundation and various Universities apart from GFRF. Moreover, it was informed that research on seven (out of 33) and two (out of 34) topics in respect of Jessore and Balaram Ambaji Sanctuaries respectively was either completed (seven topics) or was going on (two topics).

The reply, however, was silent on the research conducted on the topics identified in the Management Plans of the respective Sanctuaries. Furthermore, the concerns of the jurisdictional divisions regarding non-availability of latest research puts under doubt the co-ordination among different Department/ agencies regarding relevance, timeliness and availability of reports on research, if any conducted.

---

<sup>1</sup> was introduced to bring uniformity in forest management planning by the MoEF, GoI and aims to sustainably manage, conserve, and utilise the forest resources.

***Recommendation 8: The Department may prepare and implement a State Wildlife Research Plan to ensure that research is conducted in an integrated and effective manner.***

### **4.1.3 Submission and Availability of Research Reports**

As per NWAP-2 (2002-16), it is the responsibility of the State to acquire, evaluate and disseminate available research reports and scientific findings and data to enable better management of wildlife species and habitats.

#### ***4.1.3.1 Submission of research reports***

The Guidelines of 2006 issued by MoEF&CC provide that the final report and other scientific publications of the research project should be submitted to the Chief Wildlife Warden of the State within three to six months. As the submission of the research reports were not forthcoming, the Department came out with State specific Guidelines in March 2017.

Audit observed that the Guidelines *inter alia* detailed the procedure for processing of research proposals and general conditions for grant of permission. However, the condition regarding mandatory submission of final research report and other scientific publications to the Chief Wildlife Warden (PCCF (WL)) had not been incorporated in the State Guidelines. Moreover, though the State Guidelines mandated submission of data/ report/ findings/ thesis etc. to the WII, the Department did not put in place any mechanism to ensure the same.

Main objective of formulating these Guidelines was to ensure submission of research findings to the State Government so that useful findings are available to PA Managers for improved management of wildlife. Thus, not making it mandatory for the researchers to submit their findings to the State Government deprived PA Managers of relevant research material. Absence of such a provision in the Guidelines may result in continued non-submission of research reports by the researchers and consequent non-availability of research material for better management of PAs.

During the exit conference (October 2022) the Department acknowledged the need to revise the State Guidelines to make it binding on the researchers to submit their reports to the Department.

## **Conservation of Flora**

Flora refer to all the plant life within a particular region. Native flora is the plant life that grows/ flourishes naturally in a particular region. Flora provides food not only for humans, but also for the wildlife who live in the area and those passing through. It also provides essential services to the environment like fertilizing soil and filtering water for drinking. Thus, conservation of flora is essential for the conservation of fauna in a particular region.

## 4.2 Invasive Alien Species

An alien species is a species of flora introduced outside its natural past or present distribution. If this species becomes problematic, it is termed an Invasive Alien Species. Unless control measures are adopted in a systematic and phased manner, their infestation may pose a serious threat to the wildlife.

The Sanctuary-wise details of alien species, their effects and remedial action required are given in **Appendix IV**. During joint site visit with the RFO (July 2021) of the Jessore Sanctuary, Audit observed that the Dantiwada range of the Sanctuary was invaded with *Prosopis Juliflora* which formed a monoculture, inhibiting growth of other plant and grass species, even in the rainy season. The Land Use and Land Cover analysis conducted by SAC, Ahmedabad (December 2021) on the request of Audit also brought out that around 51 *per cent* of the geographic area of Jessore Sanctuary and ESZ was dominated by *Prosopis Juliflora*. The photographs taken during joint site visit shows the prevalence of the invasive alien species:



**Photograph 4.1: Large areas invaded by *Prosopis Juliflora***



**Photograph 4.2: No undergrowth of other plants and grass species even in rainy season**

Source: Photographs taken during joint site visit of Dantiwada range in July 2021.

Audit analysed efforts made by the authorities in the respective Sanctuaries for removal of invasive species, plantation of alternative species etc. to reduce the effects of these invasive species on the wildlife habitat as per prescriptions of Management Plan/ GEER Foundation/ MEE Reports. The observations are narrated in the following paragraphs:

- ***Jessore and Balaram Ambaji Sanctuary***

GEER Report and MEE Report 2017-18 for Jessore prescribed for total removal of invasive species. Similarly, MEE Report 2016-17 for Balaram Ambaji prescribed for removal of *Prosopis Juliflora* and *Lantana* and planting of native fruit-bearing trees.

However, Audit observed that in Jessore only a small patch (one Ha.) of the *Prosopis Juliflora* was removed and local tree species and fruit bearing species were planted (2020-21). In respect of Balaram Ambaji, the jurisdictional Division did not furnish records relating to invasive species removed and suitable plantation done to Audit (September 2022).

During the exit conference (October 2022), the Department agreed to prepare a five-year plan for the removal of invasive alien species in Balaram Ambaji and Jessore Sanctuaries.

- ***Jambughoda***

Management Plan (2012-22) prescribed for removal of 50 Ha of invasive species per year, plantation of edible species (50 Ha per year), gap plantation (50,000 plants per year in 445 Ha), fodder plot (124 Ha) and regeneration survey (775 Ha) during the years 2012-17.

Audit observed that as against the target of gap plantation in 445 Ha, plantation was done in 35 Ha in 2016-17 only during the five years' period from 2012-17. Thus, the target for gap plantation could not be achieved and fell short by 92 *per cent*. Further, no fodder development work and regeneration survey was carried out during the period 2012-17.

Regarding removal of invasive species, the Department stated (November 2022) that nearly 2,000 Ha *Lantana* has been removed in last five years. However, the Department did not furnish any evidence in support of their reply.

- ***Ratanmahal***

Management Plan (2014-24) prescribed for removal of 100 Ha of invasive species per year, promotion of rotational grazing and undertaking plantation of fodder species to fulfil the needs of Sloth Bear and habitat enrichment plantation in core zone (8 Ha per year), improvement of grasses (1 Ha per year) and regeneration of 250 Ha forest area per year.

However, the Department did not provide any information of the activities carried out in this regard (December 2022).

- ***Shoolpaneshwar***

Management Plan (2017-27) prescribed for cleaning of 170 Ha per year (totalling 850 Ha), planting grass (330 Ha), fruit/ fodder/ rare and endangered species (1,280 Ha), bamboo plantation (750 Ha) and browsable species improvement (852 Ha) during 2016-17 to 2020-21.

The jurisdictional Division stated (September 2021) that physical targets of plantation were not prescribed by the Department and therefore, it had not maintained any records and no monitoring was done regarding the same. The reply of the Division was indicative of the fact that the management Plan was not being referred in the management of the Sanctuary.

- ***Purna***

Management Plan (2014-24) prescribed for Ketki planting (125 Ha), fodder plots (400 Ha), miscellaneous plantation (120 Ha), silvi pasture development (100 Ha) during 2016-17 to 2020-21.

Audit observed that no Ketki planting, silvi pasture and other plantation was done during this period. Further, against the target of development of 400 Ha of fodder plots, only 125 Ha (31.25 per cent) was achieved during 2016-21.

Thus, despite having management prescription regarding control of invasive species, fodder plantation, natural regeneration and plantation activity, its execution was not satisfactory in the test-checked Sanctuaries during the period covered under the respective management plan, which was necessary for maintaining the ecological balance in the sanctuaries.

The Department stated (November 2022) that removal of invasive species and fodder plantation is done in the Sanctuaries as per budget availability.

**Recommendation 9: The Department may undertake a phased programme for identification of areas invaded by invasive species and removal thereof, along with its replacement with the indigenous fruits, fodder and other suitable species.**

## Conservation of Fauna

### 4.3 Wildlife population estimation

Population estimation of wild animals is important as it contributes to improved management of wildlife habitats. It is important to record the type (species, age, male- female ratio, proportions of calves, yearlings, and sub-adults) of animals, their numbers, method adopted for counting (e.g. aerial or ground count), etc. Any programme for management and conservation of wildlife would require such information for deciding on management and conservation policies.

#### 4.3.1 Estimation of wildlife in Gujarat

The estimation of Asiatic Lion, Sloth Bear, Leopard and other wildlife in Gujarat is to be conducted by the PCCF (WL) every five years. The estimation of wildlife in Gujarat during various years is shown in the table below:

**Table 4.1: Estimation of wildlife in Gujarat**

Sl. No.	Animal	2005	2006	2009	2010	2011	2014	2015	2016	2020
1	Asiatic Lion	359	-	-	411	-	-	523	-	-
2	Leopard	-	1070	-	-	1160	-	-	1395	-
3	Sloth bear	-	247	-	-	293	-	-	343	-
4	Wild Ass	-	-	4038	-	-	-	4451	-	6082
5	Blue Bull (Nilgai)	-	-	-	119546	-	-	186770	-	-
6	Crocodile	-	-	-	-	-	1098	-	-	-
7	Others <sup>2</sup>	-	-	-	-	-	-	988269	-	-

Source: Website of the Forest Department, GoG.

As can be seen from the above table except for Asiatic Lion, Leopards, Sloth Bear and Wild Ass, estimation for other species of animals was not done on

<sup>2</sup> Black Buck, Spotted Deer, Sambhar, Chinkara, Chausinga, Barking Deer, Pea fowl, Monkey, Wild boar and Pig, etc.

regular basis during the 15 years' period (2005-2020). Since population estimation is the basis of management planning, it is essential to have updated data on various wildlife species. Management Plans, not based on updated data of wildlife species is fraught with risk of non-achievement of desired objectives.

#### 4.3.2 Need for adoption of scientific method of wildlife estimation and analysis of estimates

National Bear Conservation and Welfare Action Plan, 2012 mentions that reports of very high densities of Sloth Bears in a few Protected Areas of Gujarat and Rajasthan have not been scientifically validated. Further, Gujarat Bear Conservation and Welfare Action Plan, 2012 prescribed development of protocol by 2013-14 for conducting scientific and systematic census of Sloth Bear in Gujarat. Scientific and systematic census/ estimation were also emphasized (1999) in 'Status Survey and Conservation Action Plan-Bears' of International Union for Conservation of Nature (IUCN)/ Species Survival Commission (SSC)- Bear specialist group (BSG).

Audit observed that the Department continued to use the traditional method of direct observance (direct sighting) and indirect observance (such as footprint, other marks and sound hearing) and the protocol for scientific and systematic census of Sloth Bear was not yet developed (November 2022).

The 'Status Survey and Conservation Action Plan-Bears' has also stated that unsubstantiated abundance estimates<sup>3</sup> provide a false sense of assurance in population assessment, and may confer little or no warning for populations in jeopardy.

Review in Audit of the estimation figures for Sloth Bear and Leopards for 2006 and 2016 revealed that the Sloth Bear increased from 247 in 2006 to 343 in 2016. Similarly, the Leopard estimates increased from 1,070 in 2006 to 1,395 in 2016. The increase of both the species is an encouraging sign. However, out of 1,395 leopards<sup>4</sup> in 2016, only 706 (51 per cent) were estimated based on direct observance whereas the remaining 689 (49 per cent) were estimated based on indirect observance, because of which 610 (44 per cent) Leopards could not be identified in terms of gender or age structure (matured or cubs).

Audit further observed that apart from statistical analysis, in-depth analysis of the estimated wildlife in terms of survival ratio/ pattern, seasonal patterns of movement, basic migratory routes and areas of high species density and diversity, etc., was not done by the Department. The absence of a detailed and in-depth analysis of the estimated wildlife may adversely affect the management of these wildlife in the protected areas.

## 4.4 Conservation of Fauna

Reintroductions/ conservation/ translocations have increasingly been recognised as a strategy to conserve threatened species and restore ecosystem

<sup>3</sup> Abundance estimation comprises of all statistical methods used for estimating the number of individuals in a population.

<sup>4</sup> Male: 330, Female: 278, Cubs: 177, Unidentified/ Uncertain: 610.

functions. As per the Management Plans of the six test-checked Sanctuaries, certain wildlife like Tiger, Cheetal, Chinkara, Four-horned Antelopes, Sambhars, Flying Squirrel, Wild Dogs etc. are locally extinct. Considering that certain wildlife had become locally extinct or were under threat of extinction, special efforts were required for reintroduction/ conservation of these species. However, measures taken by the test-checked Sanctuaries to stabilize/ improve such species were not commensurate with the requirements for conservation as discussed in the succeeding paragraphs.

#### 4.4.1 Establishment of breeding centres

The herbivores serve as prey-base for the carnivores and thus are essential for conservation of the species placed in the upper levels of the food chain. The management plan of the four test-checked Sanctuaries (Jambughoda, Ratanmahal, Shoolpaneshwar and Purna) acknowledged that herbivores like Sambhar, Chital, Black Buck, Spotted Deer and Chinkara have locally ceased to exist. Accordingly, the Management Plans of these four Sanctuaries while recognizing need for preservation and reintroduction of the herbivores, recommended establishment of breeding centers. Audit analysed the establishment and results of the breeding centres, wherever established and observed the following:

**Table 4.2: Establishment of Breeding Centre and results thereof**

Sanctuary	No. of breeding centres required to be established as per Management Plan	Wildlife	Breeding Centre established and result thereof
Jessore Balaram Ambaji	No operational Management Plan during the period 2016-21.	NA	Breeding Centre for Chital and Red Jungle fowl was operational since 2019-20.
Jambughoda	Breeding Centre for the wildlife mentioned in column 3 were to be established.	Chital, Four-horned antelope, Grey jungle fowl, Indian hare & other suitable species	Not established (November 2022).
Ratanmahal	01	Chital/ spotted deer, Sambar and Common India hare	Though a Breeding Centre was established in 2012, it was lying idle as on August 2021 due to death of the animals brought for breeding.

Sanctuary	No. of breeding centres required to be established as per Management Plan	Wildlife	Breeding Centre established and result thereof
Shoolpaneshwar	Breeding Centre for the wildlife mentioned in column 3 were to be established.	Four horned Antelope, Barking Deer, Indian hare, Alexandrine Parakeet, Red Jungle Fowl, Spotted deer, Vulture, Peafowl.	<p>Breeding centre for Four Horned Antelope and spotted deer were established in 2014-15 and 2017-18 respectively.</p> <p>No breeding centre was established for other species (September 2022).</p> <p>Six spotted Deer were bred during 2019-21 and all the 10 Spotted Deer (including two breeding pairs) were released (2020-21) in the safari park.</p> <p>Though, 17 Four Horned Antelope were bred in between 2014-15 and 2020-21, these were yet to be released (October 2022).</p>
Purna	Breeding Centre for the wildlife mentioned in column 3 were to be established.	Barking Deer and Chital	One Deer Breeding Centre was operational (November 2022).

Audit observed that the release of Bred spotted Deer in the safari park instead of the Sanctuary area was not as per the intended purpose of breeding i.e. enhancing prey-base of the carnivores in the Shoolpaneshwar Sanctuary. Lack of prey base in the Sanctuary areas may adversely affect the sustenance of carnivores in these areas.

The Department stated (November 2022) that Director, Sakkarbaug Zoo, Junagadh would be requested to provide surplus animals for the Breeding Centre at Ratanmahal Sanctuary.

#### 4.5 Human wildlife conflict and rescue

The destruction and disturbance in habitats of wild animals due to anthropogenic pressures have resulted in animals entering human settlements in



search of food and water, culminating in conflicts. Human-wildlife conflict occurs when wildlife requirements overlap with those of human population.

As per the latest wildlife estimates for the state of Gujarat (2016), 64 *per cent* of the leopards and 43 *per cent* of the sloth bears were found outside the Sanctuary areas. Further, the Department had acknowledged that in the five years' period from 2016-21, a total of 116 cases of human deaths, 679 cases of human injuries, and 21,273 cases of injuries or deaths of cattle had been reported. The six test-checked Sanctuaries during the period 2016-21 had reported a total of 50 human deaths and eight injuries. They had also reported 264 cases of cattle deaths.

In view of instances of human-wildlife conflict, it is essential that the concerned wildlife authorities (Division/ Range) are well-prepared to respond to such conflicts. Guidelines for Human-Leopard Conflict Management issued (April 2011) by the MoEF prescribe that each forest division should have a well-trained operational Emergency Response (ER) team<sup>5</sup> equipped with chemical capture equipment, drugs, appropriate cages, etc., to manage conflict situations. Moreover, Animal Rescue Centre is also essential for the rescued/ injured animals/ birds.

Audit analysed preparedness of the Department with reference to availability of emergency response teams, required equipment and animal rescue centers.

#### **4.5.1 Creation of emergency response teams and availability of required resources**

Gujarat Bear Conservation and Welfare Action Plan had prescribed requirement of two separate rescue and emergency response teams for Gandhinagar Wildlife Circle (Balaram Ambaji and Jessore) and Vadodara Wildlife Circle (Jambughoda and Ratanmahal) by 2013. As against this, Gandhinagar Wildlife Circle had established a 'Rapid Response Team' in March 2021 while the Vadodara Wildlife Circle was yet to establish such a team (October 2022).

Similarly, the management Plan of Jambughoda Sanctuary had prescribed an emergency rescue team-cum-mobile squad<sup>6</sup> with a pick-up van (wildlife rescue ambulance) and necessary equipment including cages. However, the squad was yet to be established (October 2022).

Thus, the Department did not establish rescue and response teams to effectively manage human-wildlife conflicts.

The status of required human resources/ equipment and animal rescue Centre, in the Sanctuaries is shown in the following table:

---

<sup>5</sup> consisting of an officer not below the rank of Assistant Conservator of Forests (ACF), one qualified veterinarian, and a minimum of five trained support staff.

<sup>6</sup> Comprising one forester, two guards and 3-5 labourers.

**Table 4.3: Status of animal rescue preparedness as of September 2022**

Sanctuary	Animal rescue Centre	Veterinary doctor	Tranquilizer Gun	Other equipment <sup>7</sup>
Balaram Ambaji	Available	Hired on contract on yearly basis	Available	Available
Jessore	Not available	Hired on contract on yearly basis	Available	Available
Jambughoda	Available	Not available	Available	Not available
Ratanmahal	Not available	Not available	Not available	Not available
Shoolpaneshwar	Not available	Not available	Not available	Only cages/enclosures were available
Purna	Not available	Not available	Not available	Not available

Source: Information furnished by the jurisdictional divisions.

The Animal Rescue Centre at Balaram Ambaji Sanctuary was equipped with operation theatre, postmortem room, stretcher, sterilization, rescue vehicle, and medicines. However, the Centre at Jambughoda Sanctuary was found inoperative (August 2021). In Jambughoda (as of August 2021) and Shoolpaneshwar (September 2021) Sanctuaries, services of veterinary doctor of other Department/ District/ Taluka hospital, were being availed. In the case of Balaram Ambaji and Jessore Sanctuaries, though four tranquilizer guns were available, only one was in working condition. In Jambughoda, only one tranquilizer gun was available without anesthesia medicine. In Shoolpaneshwar, the cages and animal enclosures were old and rusted indicating lack of proper maintenance.

Thus, in spite of reported instances of human-wildlife conflicts, the Sanctuaries were not well equipped and prepared in terms of required human resources and equipment. This may affect the protection and conservation activities in and around the wildlife Sanctuaries.

***Recommendation 10: The rescue centers may be provided with the required human resources including full-time veterinary doctors and equipment/gears, medicines, and other materials.***

#### **4.6 Appointment of Honorary Wildlife Wardens**

People's participation and support is crucial for nature and wildlife conservation and protection which can be achieved by involving community leaders and other persons of standing. Such assistance can be particularly useful in control over poaching for the clandestine trade in wild animals or their articles, carrying the message of conservation to the people. Section 4 of the WPA allows appointment of suitable people from public as Honorary Wildlife Wardens (HWW). Appointment of HWW is made district-wise.

<sup>7</sup> Specialised cage, dedicated vehicle for rescue, specialised safety gear.

The six test-checked Sanctuaries and their surrounding areas were spread in six Districts<sup>8</sup>. Audit observed that the tenure of the HWW appointed in 2008 for all the six Districts expired in 2010. State Government did not initiate any action for fresh appointment for seven years thereafter. Subsequently, HWW were re-appointed (January 2019) in only four Districts<sup>9</sup> for a period of two years, which expired in January 2021. No further appointment has been made since then except in Narmada District (November 2022). It was also observed that Vadodara and Dang Districts did not submit recommendations for appointment of HWW despite instructions (July 2018) by the PCCF (WL). Thus, the post of HWW remained vacant in these two Districts since May 2010.

Thus, the Department did not ensure people's participation in conservation efforts, through the appointment of HWW, as envisaged in WPA.

#### 4.7 Good practices

During joint site visits (July 2021 to September 2021) with the jurisdictional staff (DCFs/ ACFs/ RFOs/ Foresters) audit noticed certain good practices, however the same were found localized and could be replicated across Sanctuaries.

- Artificial termite mound at Jessore- The authorities in Jessore Sanctuary created artificial termite mounds for Sloth Bear<sup>10</sup> as shown in the photograph below. Audit observed signs of Bear (claw marks and scat) frequenting the artificial termite mound. This was a good practice which could be replicated in other Sanctuaries having presence of Sloth Bear to further supplement conservation efforts.

Photograph 4.3: Artificial termite mounds in Jessore Sanctuary



Artificial termite mound: Holes indicating that termites were being sucked by Sloth Bear.  
Source: Photograph taken during joint site visit of Dantiwada range on 21 July 2021.

<sup>8</sup> (i) and (ii) Balaram Amabaji and Jessore: Banaskantha; (iii) and (iv) Ratanmahal and Jambughoda: Dahod, Panchmahal and Vadodara; (v) Shoolpaneshwar: Narmada; (vi) Purna: Dangs.

<sup>9</sup> (i) Banaskantha (ii) Dahod (iii) Panchmahal (iv) Narmada.

<sup>10</sup> Sloth Bears have a broad palate, protrusible lips, and they lack the upper two middle incisors, all specializations for eating ants and termites (Source: Bears 'Status survey and conservation action plan' brought out by IUCN).

- **Water recharge and soil erosion prevention structures at Ratanmahal and Jambughoda**

Check walls, trenches and soil erosion prevention structures were noticed inside Jambughoda and Ratanmahal Sanctuaries. The creation of such structures in remote and tough terrain of the Sanctuaries helps in arresting soil erosion.

- **Rainwater harvesting at Purna**

Rain water harvesting structure was constructed alongwith the watch-tower in Bardipada Range. Due to this, the rainwater could be channelized into an underground water tank constructed at the base of the watch-tower. As water was not normally available around the location, the rain water harvested could be used for fire control and human needs of staff during summer months, in addition to protective function of the watch tower. This was an innovative practice, which could be replicated at other locations.

**Photograph 4.4: Rain water harvesting structure at Bardipada Range of Purna Sanctuary**



Source: Photograph taken during joint site visit in September 2021.

- **Wind powered water pumps at Jessore, Ratanmahal and Jambughoda**

Wind powered water pumps were built in conjunction with artificial water storage structure created for use of animals at Jessore, Ratanmahal and Jambughoda Sanctuaries. Creation of such pumps is helpful in remote areas of the Sanctuaries where regular electric pumps cannot be used (due to non-availability of electric connection) for filling the water holes, guzzlers, water tanks etc. It would also reduce reliance on manual filling of these water sources.

**Photograph 4.5: Wind powered water pump (Jambughoda WLS)**



Source: Photograph taken during joint site visit in July/ August 2021.

## CHAPTER-V

### Protection of Wildlife Sanctuaries

#### *A Snapshot*

*Forest personnel were trained on a rifle other than the one currently used by the Department. Check-posts/ naka were either not established or were inoperative and lacked adequate staff, rendering them ineffective for protection of wildlife and its habitats. Sanctuaries were not adequately equipped with 24X7 communication devices. Due to these lacunae in the protection function, illegal cutting of trees was prevalent in the Sanctuaries.*

#### Introduction

Wildlife Protection means such activities that are directly related to protection and include establishment and maintenance of anti-poaching camps, check-posts, boundary protection structures, patrolling, intelligence etc. Protection plays a very important role in wildlife conservation.

National Wildlife Action Plan (2002-16) emphasized the importance of arming forest staff with sophisticated weapons and other equipment including better and faster communication facilities to enable them to combat poaching and control illicit cutting of trees effectively.

In order to ascertain the status of preparedness of the Department for protection of wildlife habitats, Audit analysed various aspects of safety and security in respect of the six test-checked Sanctuaries. Audit observations are discussed in the succeeding paragraphs.

#### 5.1 Availability of frontline staff

The forest area is divided into Beats, Rounds, Ranges and Divisions for better management. The officials in charge of the Beat (Beat Guard) and Round (Forester) are the frontline staff responsible for conservation and protection of forests. The sanctioned strength *vis-a-vis* persons in position of frontline staff as of 31 March 2021 were as under:

**Table 5.1: Sanctioned strength *vis-a-vis* person in position of frontline staff as of 31 March 2021**

Sanctuary	Sanctioned Strength	Person in position	Vacancy	Percentage of vacancy	Period of vacancy
Balaram Ambaji	64	50	14	21.88	Between December 2018 and March 2021
Jessore	18	13	5	27.78	Between April 2020 and March 2021

Sanctuary	Sanctioned Strength	Person in position	Vacancy	Percentage of vacancy	Period of vacancy
Jambughoda	32	23	9	28.13	Between June 2016 and January 2021
Ratanmahal	18	11	7	38.89	
Shoolpaneshwar	98	57	41	41.84	Between January 2016 and February 2021
Purna	44	30	14	31.82	Not furnished

Source: Information furnished by the respective jurisdictional Divisions.

As can be seen from above, the vacancy in frontline cadre in the six test-checked Sanctuaries ranged between 22 to 42 *per cent* (between January 2016 and March 2021).

The vacancy in frontline staff, among other things, affected the protection function which was evident from illegal cutting of trees, cultivation in the Sanctuary area and non-operational check posts/ insufficient posting of manpower at check post/ *naka* as discussed in paragraphs 3.5.1.1; 5.3 and 5.5 of this report. Thus, the Department was required to fill the vacancies in the critical cadre of forest personnel for better protection and management of wildlife and its habitat.

## 5.2 Availability and status of arms

As per Gujarat Forest Statistics (2020-21), there were 110 cases of assaults on forest officials during 2016-21. Further, there were 18,469 cases of illicit cutting of trees (2016-21). Equipping eligible forest personnel with adequate and operational firearms would act as a deterrent against such incidents of assaults and illegal cutting of trees, poaching etc. The F&ED decided (August 2007) that the forest officials from forest guard and above shall be eligible for getting the firearms for implementation of various statutes *viz.* IFA, 1927; WPA, 1972 and FCA 1980.

The availability and working condition of the firearms in the test-checked Sanctuaries is depicted below.

**Table 5.2: Availability and status of firearms in the test-checked Sanctuaries as on 31 March 2021**

Name of the Sanctuary	Persons in Position (forest guard & above)	Working firearms available (in Nos.)	Percentage of working firearms to eligible staff
(1)	(2)	(3)	(4)= (3)/(2) x 100
Balaram Ambaji	50	20	40.0
Jessore	13	10	76.9
Jambughoda	23	16	69.6
Ratanmahal	11	6	54.6
Shoolpaneshwar	57	38	66.7
Purna	25	12	48.0

Source: Information furnished by the jurisdictional divisions.

From the above, it can be seen that there was wide disparity in terms of per head availability of firearms among the test-checked Sanctuaries which ranged from 40 to 77 per cent.

### 5.2.1 Personnel being trained on different rifle than the one in current use

In order to ensure protection of wildlife, fire practices and training of the security personnel is essential.

The arms training for the personnel of the Department was being conducted in Gujarat Police Academy at Karai, Gandhinagar and at State Reserve Police Training Centre, Sorath, Junagadh. Audit observed (October 2021) that the forest personnel were trained on 0.22 rifle though the rifles being used by them were 0.12 bore rifles. The specifications (range, weight and types of bullets used) of the rifle on which the forest personnel are trained and the rifles used by the Department vary from each other. This may affect the operational effectiveness of the personnel during real life situations.

## 5.3 Patrolling and Check-posts

Patrolling is integral to ensure protection and conservation of wildlife. Regular patrolling and establishment of check-post (*naka*) at strategic points function as a deterrent against poaching, illicit tree cutting and other illegal activities in the protected areas. Further, availability of vehicles in working condition is essential for the purpose of patrolling and rescue of wildlife.

### 5.3.1 Availability of Vehicles

The Department provides vehicles *viz.* four wheeler/ two wheeler etc. to the field offices based on the sensitivity of locations/ duties performed. The details related to vehicles available and their status in the six test-checked Sanctuaries as on 30 September 2022 are as tabulated below.

**Table 5.3: Number and status of vehicles available in the Sanctuaries as on 30 September 2022**

Sanctuary	Area of Sanctuary (in Sq. Km.)	Number of Jeeps/pickup van			Number of two-wheelers			Coverage of Sanctuary area (sq. km. per four wheeler)	Coverage of Sanctuary area (sq. km. per two wheeler)
		Total	Working	Not Working	Total	Working	Not Working		
Jessore	180.66	3	2	1	9	9	0	90.33	20.07
Balaram Ambaji	544.78	10	10	0	26	26	0	54.45	20.95
Ratanmahal	55.65	4	2	2	9	9	0	27.83	6.18
Jambughoda	130.38	4	2	2	19	19	0	65.19	6.86
Shoolpaneshwar	607.70	4	1	3	16	16	0	607.70	37.98
Purna	160.84	10	9	1	28	26	2	17.87	6.19

Source: Information provided by the respective Division.



From the above table, it is evident that coverage of jeeps/ pickup vans in the Sanctuary had wide disparity amongst various Sanctuaries and it ranged between 17.87 sq. km. per vehicle for Purna Sanctuary to 607.70 sq. km. per vehicle for Shoolpaneshwar Sanctuary.

### 5.3.2 Check-posts

Check-post (*naka*) at strategic points function as a deterrent against poaching, illicit tree cutting and other illegal activities in the protected areas. The details of roads passing through the six test-checked sanctuaries and number of check posts are given in the table below:

**Table 5.4: Details of roads passing through the six test-checked sanctuaries and the Check-posts established in the test-checked Sanctuaries as on September 2022**

Name of the Sanctuary	No. of roads passing through the Sanctuary	Number of Check posts envisaged in the Management Plans	Total Check-posts established	Operative Check-posts	Number of <i>naka</i> guards employed to operate the Check-posts
Balaram-Ambaji	15	8	2	2	4
Jessore	7	10			
Jambughoda	7	3	5	1	Not Furnished
Ratanmahal	4	Not provided in Management Plan	3	3	Not Furnished
Shoolpaneshwar	46	10	4	2	1
Purna	Not Furnished	12	7	7	12
Total	79	43	21	15	17

Source: Information provided by the jurisdictional Division.

From the above table, it can be seen that for the five test-checked Sanctuaries (excluding Ratanmahal) as against the 43 check posts proposed in the Management Plan, only 18 were established, out of which only 12 were operational. In the case of Ratanmahal Sanctuary, though the Department stated (November 2022) that all the three Check-posts were operational, no data regarding forest personnel posted in these Check-posts was furnished.

Observations noticed during joint field visit with the concerned RFOs (July 2021 to September 2021) have been discussed in Paragraph 5.5 and the following sub-paragraphs:

### 5.3.2.1 Balaram Ambaji and Jessore: Deesa and Palanpur



**Photograph 5.1: Naka on Deesa-Palanpur Highway**  
Photograph taken by Audit on 21 July 2021

Audit observed (July 2021) that one *naka* was situated at Deesa on the Deesa-Palanpur Highway and the other on the outskirts of Palanpur. Both the *nakas* were far away from the boundaries of the Sanctuaries and were established only for the purpose of providing forest pass to the vehicles carrying timber/ wood. Since these *nakas* were looked after by a single person at any time of the day, it made stopping and checking of vehicles

difficult. Audit noticed that the vehicles were stopping on their own to collect the required pass. This reduces the utility of the *naka* for curbing illegal removal of timber/ wood from the Sanctuaries.

Banaskantha Forest Division replied (September 2021) that there was a proposal to shift the Deesa *Naka* at a suitable place.

### 5.3.2.2 Jambughoda Sanctuary

During joint site visit with the jurisdictional RFO, Audit observed (July 2021) that though at the entry point near Lonkadi, Shivrajpur Range, a *naka* was constructed, however no forest official was posted to check the activity on road leading to the Sanctuary. Further, on the other side of the Sanctuary (Kohivav forest area) touching revenue areas and rural road, no *naka* was established. Thus, there was no check on the activities in this part of the Sanctuary. Audit noticed illegal cutting of trees (July 2021) along the *kachcha* road leading to Kohivav watch tower as mentioned in Paragraph 5.5.

### 5.3.2.3 Shoolpaneshwar Sanctuary

During joint site visit with concerned RFOs, Audit observed (September 2021) that out of the two operational Check-posts, no forest personnel<sup>1</sup> were posted at Thavadia Check-post of Gora range. Further at Kakoti Forest *Chowki* in Sagai Range near Maharashtra State Border, no regular beat guard<sup>2</sup> was posted. Thus, the effectiveness of the Check-posts for protection was compromised. This was evident from the instances of illegal cutting of trees as discussed in Paragraph 5.5.

<sup>1</sup> The Check-post was being operated by the *mandali* solely for collecting fees for entry of vehicles from the visitors.

<sup>2</sup> The beat guard posted was having three charges as against the usual charge of a single beat (smallest administrative unit of the forest area).

### 5.3.2.4 Purna Sanctuary

During joint site visit with the RFO, Audit observed (September 2021) that the *naka* enroute Mahal Eco tourism site (inside the Sanctuary) was being operated by eco-tourism society (*mandali*) for collecting fees from the visitors only. Audit observed that though the Department considered this check-post as existing and operational in the Management Plan (2014-2024) of the Sanctuary for the purpose of protection and conservation activities in the Sanctuary area, however, neither any forest personnel were posted there nor any record of Beat Guard's visit was available at the *naka*. Moreover, the barrier of the *naka* was located on the road leading to the eco-tourism site instead of main road leading to the Sanctuary area. This reduced the utility of the *naka* for curbing illegal removal of timber/ wood from the Sanctuaries or regulating tourist movement in the Sanctuary area.

Thus, among other things the check-posts/ *naka* were found to be deficit in staff. In view of the number of roads passing through the Sanctuaries *vis-à-vis* the number and condition of the existing check-posts, the Department needs to establish check posts at the strategic locations.

**Recommendation 11: The Department may ensure that check post/ *naka* are established at strategic locations, properly maintained, and provided with adequate staff to ensure their effectiveness.**

## 5.4 Communication devices

Better and faster communication facilities help the forest personnel in protection of wildlife and control of illicit cutting of trees. Details of availability and status of wireless equipment/ other surveillance items in the test-checked Sanctuaries are given in the table below:

**Table 5.5: Availability and status of wireless and Walkie-Talkie as on 30 September 2021**

Name of the Sanctuary	Wireless		Walkie-Talkie	
	Total No.	Working condition	Total No.	Working condition
Balaram Ambaji	13	13	91	54
Jessore	9	9	35	27
Jambughoda	2	0	10	Not furnished
Ratanmahal	2	Not furnished	13	Not furnished
Shoolpaneshwar	18	15	99	93
Purna	16	16	31	31

Source: Information furnished by the respective Division offices.

From the above, it is evident that in Balaram Ambaji, Jessore and Shoolpaneshwar Sanctuaries, 59 per cent, 77 per cent, and 94 per cent walkie-talkie were operational.

During joint site visit of Jambughoda Sanctuary (July/ August 2021), Audit observed that in the inner part<sup>3</sup> of the Sanctuary, neither coverage of mobile network nor wireless facility, was available. Further, the vehicles used by the

<sup>3</sup> Kathkuan forest area, Ghagal Mata forest area.

forest personnel in Jambughoda and Ratanmahal Sanctuaries did not have the facility of wireless communication. Moreover, the wireless station and wireless equipment at Jambughoda Range office were not in working condition (July 2021). Incidentally, illegal cutting of trees was also noticed in this area of the Sanctuary as discussed in the Paragraph 5.5.

Similarly, during joint site visit (September 2021) of Shoolpaneshwar Sanctuary, Audit noticed that there was no mobile connectivity near Zarwani Eco tourism site. Also, the wireless station at Zarwani Eco Tourism site was devoid of a battery back-up and therefore, the wireless system was not working during interruption in electricity supply. No walkie-talkie was available at Zarwani Round as the same had not been received back from repairs (sent approximately a year ago).

Lack of seamless communication between officials and personnel posted in frontline duty for reporting any happening/ incident or call back-up force was detrimental for preservation and conservation activities.

During the exit conference (October 2022), the Department assured that steps would be taken for ensuring connectivity at all times. Further the Department in their reply (November 2022) stated that wireless and walkie-talkie sets of Jambughoda and Ratanmahal Sanctuaries had been sent for necessary repairs.

***Recommendation 12: The Department may consider equipping the field staff state-of-the-art communication and surveillance devices to effectively control activities detrimental to wildlife habitats.***

## 5.5 Illegal cutting of trees

Deficiencies in operation of *naka* and management of wireless communication devices led to lacunae in the monitoring of activities inside the Sanctuary. During joint site visit with the forest officials, instances of illegal tree cutting were noticed. Audit observed stumps of the cut trees, axe marks on tree trunk and stumps burnt to hide illicit cutting of trees inside Jambughoda Sanctuary.

Similarly, Audit observed numerous instances of tree cutting over a period of time<sup>4</sup> in Fulsar, Sagai and Gora Range of the Shoolpaneshwar as both freshly cut and timeworn tree stumps were observed. In Purna Sanctuary also, Audit noticed instances of illegal cutting of trees.

<sup>4</sup> As both fresh as well as old tree stumps were observed, indicating that illegal tree cutting was prevalent in the Sanctuary.



**Photograph 5.2: Freshly cut tree stump, Fulsar Range, Shoolpaneshwar (Photograph taken during joint site visit on 8 September 2021)**



**Photograph 5.3: Illegal cutting of trees in Purna. (Photograph taken during joint site visit on 22 September 2021)**

The ACF (in-charge) and Range Forest Officer, Jambughoda stated (July 2021) that round the clock patrolling was not possible because of shortage of frontline staff and the trees had been cut over a period of time.

Thus, illegal cutting of trees was prevalent in the Sanctuaries which indicated the need to further strengthen working of Check-post/ *naka* and providing sufficient trained human resources equipped with necessary arms, vehicles and functional communication equipments.

## CHAPTER-VI

### Non-Forest Activities in and around Sanctuaries

#### *A Snapshot*

*The user agencies either did not apply under the Forest Conservation Act (FCA)/ Wildlife Protection Act (WPA) for obtaining necessary approval or completed the work of widening of roads despite pendency of approval from MoEF&CC and NBWL. The concerned authority had certified the details (regarding location of road project with reference to protected area/ ESZ and compliance to the provisions of FCA) incorrectly while forwarding the proposal to MoEF&CC which indicated inadequate monitoring over the Protected Areas and ESZ and lack of adequate scrutiny of the proposals. This also led to non-submission of application for required clearance from NBWL. The user agencies had applied for lesser land than the actual requirement.*

*The State Ecotourism Policy 2007 was not updated/ modified considering the provisions of 'Policy for ecotourism in forest and wildlife areas' issued by MoEF&CC in 2018. Ecotourism sites were developed in the Sanctuaries in violation of FCA and WPA. Site specific ecotourism plans were not developed for any of the Sanctuaries test-checked by Audit. The Department neither devised any monitoring mechanism for regulated access nor fixed the carrying capacity of the respective Sanctuary based on scientific study. As such, there was no ceiling limit of visitors and vehicles and impact of tourism/ pilgrimage on the natural environment remained to be monitored and regulated. The Sanctuaries were open to tourists all through the year, which would adversely affect mating and regeneration of wildlife.*

#### **Introduction**

Protected Areas (PAs) and adjoining areas (ESZ/ Wildlife corridors) being treasure troves of biodiversity, it is of utmost importance to regulate activities which have a negative impact on wildlife habitats within these areas. Guidelines for declaration of ESZ around PAs issued (February 2011) by MoEF prohibited undertaking several activities like commercial mining, saw mills, setting of industries causing pollution, establishment of major hydroelectric projects, etc. Further, it brought construction of new roads, widening of existing roads, regulating tourism activities etc. within the ambit of regulated activities to minimise the ecological damage from such activities.

Audit observed instances of violations of the provisions of the Forest Conservation Act (FCA), 1980 and Wildlife Protection Act (WPA), 1972, in the grant of approval and regulation of non-forest activities in and around PAs. These have been discussed in the succeeding paragraphs.

## 6.1 Widening of existing roads

To maintain the integrity of Protected Areas, wildlife corridors and ESZs; construction of new roads and expansion of existing roads are regulated vide various Acts, Rules and Guidelines issued by the Central and State Governments. The relevant provisions of the various statutes in this regard are as under:

- i. Prior approval of National Board of Wild Life (NBWL) is required under Section 29 of WPA for diversion of land of Wildlife Sanctuaries (Sanctuaries) and National Parks (NP).
- ii. Prior approval of Central Government i.e. MoEF&CC is required under FCA 1980 for diversion of forest land.
- iii. Prior approval of NBWL and environment clearance<sup>1</sup> under Environmental Impact Assessment (EIA) Notification 2006 is required for any project located within ESZ area<sup>2</sup>.
- iv. Guidelines and clarifications issued (2019) by MoEF&CC state that “non-forest lands acquired by the Government Departments for construction of roads and the vacant area in the Right of Way (RoW) which were subsequently planted and notified as protected forests for management purposes will attract the provisions of FCA, 1980”. Similarly, use of forest land, for road widening even if such forest land falls within existing RoW will require prior approval of Central Government under the FCA.

Audit observed that four road widening projects were executed in three out of the six test checked Sanctuaries<sup>3</sup> and their notified ESZ during the period 2016-2021. Out of these four projects, irregularities were noticed in three projects as brought out in subsequent paragraphs.

### 6.1.1 Widening of Danta-Ambaji State Highway (passing through Balaram Ambaji Sanctuary and its ESZ area)

Roads and Buildings (R&B) Division, Palanpur (the User Agency) issued the work order (13 June 2018) for widening of Danta to Ambaji State Highway, part of which passes through Reserve Forest, Protected Forest, Sanctuary area and ESZ. The work was completed in 2020. Audit observed that the project required prior permission (i) under FCA for diversion of forest land, (ii) under WPA for diversion of Sanctuary land and also (iii) clearance of NBWL for executing the project in ESZ area. User agency executed the road widening project in four packages. Status of seeking and receiving of required prior approvals in these packages was as discussed below:

---

<sup>1</sup> As per EIA notification, any State highway/ National highway/ Expressway expansion project falling under ESZ and whole or part of the project located within 5 Km from the boundary of the PA, will require prior environment clearance from MoEF&CC is required.

<sup>2</sup> Notified ESZ or within 10 km of wildlife Sanctuary, where ESZ has not been finally notified.

<sup>3</sup> Balaram Ambaji, Purna and Shoolpaneshwar.

**Table 6.1: Violations of provisions during widening of Danta-Ambaji State Highway**

Chainage	Type of land	Requirement of approval/ clearance	Observations
90/0 to 97/0	Forest land in ESZ area	Approval under FCA and clearance of NBWL	<ul style="list-style-type: none"> <li>Approval under the FCA was not received (November 2022).</li> <li>No application for clearance from NBWL was submitted (November 2022).</li> </ul>
97/00 to 97/480 and 101/400 to 102/325	Forest land in Sanctuary area	Approval under FCA and WPA	Work was commenced without receipt of prior approval under WPA and FCA, which were received later on (August 2019 and July 2020).
97/480 to 101/400 and 103/322 to 110/0	Forest land in ESZ area	Approval under FCA and clearance of NBWL	Though prior approval was obtained (September 2010) under FCA, no application was made for clearance from NBWL (November 2022).
110/0 to 112/510	Forest land in ESZ area	Approval under FCA and clearance of NBWL	No application was made for prior approval under FCA and clearance from NBWL (November 2022).

Further, in respect of Chainage ‘97/00 to 97/480 and 101/400 to 102/325’ as per approval under WPA received in July 2020, the user agency was to commence work only after approval of wildlife mitigation plan and modifying the road design as per animal passage plan. Since, the user agency had already commenced work before receipt of the above said approval, this was not only a violation of the provisions but also left no scope for modifications in the road design, if required. Moreover, though the DCF, Banaskantha had repeatedly instructed (between November 2019 and May 2021) the user agency to submit and get approval of the mitigation plan, the user agency did not submit such mitigation plan (November 2022). In the absence of suitable mitigation plan, wildlife was left vulnerable to the negative impacts of the project.

### 6.1.2 Widening of Vyara-Bhenskatri-Kalibel-Pimpri Road (passing through Purna Sanctuary and its ESZ area)

R&B Division, Ahwa (the user agency) issued a work order (19 November 2019) for widening (from existing 7 m to 10 m) of Vyara-Bhenskatri-Kalibel-Pimpri Road with stipulated date of completion as 18 May 2021. Portions of the widened road passed through forest area of Purna Sanctuary and its notified ESZ.

Audit observed that the project required prior permission under FCA for diversion of forest land, under WPA for diversion of Sanctuary land and also clearance of NBWL for executing the project in ESZ area. However, the user agency applied for permission in January 2021 under FCA and WPA only after the commencement of work and also completed<sup>4</sup> the work before receipt of the requisite approvals. Audit observed that MoEF&CC accorded in-principle

<sup>4</sup> As observed during joint site visit of the road along with the Range Forest Officer (RFO), Bhenskatri Range on 22 September 2021.



approval under FCA in July 2022. It was also observed that application for approval under WPA for executing the work in Sanctuary area was still pending (September 2022). Further, No Objection Certificate (NOC) was issued (June 2021) by the PCCF (WL) at his own level for executing the project in the ESZ area without mandatorily referring the matter to the competent authority i.e. NBWL.

The Guidelines issued by MoEF&CC (March 2019) provided that the vacant area in the existing Right of Way (RoW) which was subsequently notified as protected forest would require prior approval of the Central Government under the FCA for widening/ extension of the existing road. Audit observed that the user agency had applied for diversion of forest land under FCA for width of 0.25 m only (0.125 m on either side of the road) even though it had executed the widening of road for the width of 3 m (10 m minus 7 m). Thus, for widening of the entire stretch of the road, forest land of 3.1572 Ha was diverted. However, the user agency applied for approval for diversion of forest land of 0.3299 Ha only.

The Department stated (November 2022) that as per measurements done by its officials with the officials of R&B Department, the width of the road ranged between 8.30 m to 10.00 m, averaging to 9.60 m. The Department further contended that the user agency had executed the work within the permissible limit of 9.75 m, which was in accordance with the orders of the PCCF of August 2003 and hence, there was no violation of any prevailing provision.

The reply of the Department is not acceptable as the orders issued by PCCF in August 2003 were superseded by the Guidelines issued by MoEF&CC in March 2019.

### **6.1.3 Widening of Devalia to Rajpipla National Highway (passing through ESZ area of Shoolpaneshwar Sanctuary)**

National Highway Division, Bharuch executed work of widening of 24 Km stretch of Devalia to Rajpipla section of National Highway 56 after getting prior approval for diversion of Protected Forest land on both side of the road under FCA in 2017.

Audit noticed that DCF, Social Forestry Division, Narmada while processing the application under FCA and forwarding his findings to Circle Office, incorrectly certified that the road was beyond 20 Km from the boundary of the Sanctuary. However, as per KML file of the Sanctuary and its ESZ as provided by the GIS cell of the Department, the road was situated at a distance of 2.5 Km from the boundary of the Sanctuary. Audit observed that DCF certified that the project site (or part thereof) was not located in ESZ area. Accordingly, DCF mentioned in the application that the project did not require environment clearance (EC) under the Environment (Protection) Act 1986. However, as per the KML file, out of the 24 Km stretch of the proposed road, approximately five Km stretch fell within the ESZ area of Shoolpaneshwar Sanctuary. Thus, certification by the DCF was factually incorrect.

On this being pointed out, the DCF, Social Forestry Division, Narmada accepted (September 2021) that the distance of the road from the Sanctuary was incorrectly stated as 20 Km and necessary action had been initiated to obtain *post-facto* permission/ EC to work in ESZ.

Thus, incorrect certification of the project location with respect to Sanctuary/ ESZ by the concerned authority led to non-submission of application for required clearance from NBWL and consequent absence of any wildlife mitigation plan for the road project. Jurisdictional forest division (i.e., Narmada Forest Division) also did not take cognizance of the fact and the work was executed without any clearance from NBWL.

The above instances of violations show that the Department did not have an adequate monitoring mechanism to deal with such aspects of non-forestry activities.

#### **6.1.4 Action and levy of penalty due to violation of the provisions**

Audit observed that MoEF&CC had issued (January 2018) Guidelines on the quantum of penalties to be imposed on activities which constitute violation of provision of the FCA, and Rules made thereunder. The quantum of penalties and action to be taken by the State authorities against the user agency for violation, and against the concerned forest officials for not being able to prevent use of forest land for non-forestry purpose, depends upon the nature/ category of violation.

Audit observed that the Department neither initiated any action nor imposed any penalty against the user agencies and concerned authorities in the case of the road projects mentioned above.

***Recommendation 13: The Department may ensure proper scrutiny of the proposal for any development project, regarding project location with reference to protected area/ ESZ/ wildlife corridor and commencement of work may be allowed only after receipt of all the necessary permissions.***

## **6.2 Ecotourism**

Ecotourism is a non-forest activity and has both positive and negative impacts on wildlife. On the one hand, it brings about awareness of wildlife conservation among the people while on the other, it leads to disturbance to the wildlife and its habitat. Hence, the ecotourism in the Sanctuary can be promoted only up to a sustainable level to minimize its negative aspects.

The Gujarat Ecotourism Policy 2007 envisaged to promote nature based non-consumptive tourism and to provide for participation and flow of economic benefits to local people. The policy provided for site-specific management plan for each ecotourism site.

The MoEF&CC came out with the ‘policy for ecotourism in forest and wildlife areas’ in September 2018. The policy prescribed that ecotourism facilitation within the forest and wildlife areas shall be a part of the management or working

plan of the unit duly identifying locations, permissible activities, permissible time for visit and mode of travel.

### **6.3 Revision of Gujarat Ecotourism Policy 2007**

Audit compared the provisions of the State policy of 2007 with the ‘policy for ecotourism in forest and wildlife areas’ issued by the MoEF&CC in September 2018 and observed the following:

- The policy of 2018 issued by MoEF&CC prescribes for identification of potential sites for ecotourism within the protected area and fixing the carrying capacity of the PA in terms of number of visitors, number of vehicles and duration of exposure. However, the State ecotourism policy prescribes for the estimation of carrying capacity of specific ecotourism sites only instead of fixing the overall carrying capacity of the entire PA.
- The MoEF&CC policy prescribes for imparting specialized training on ecotourism activities to enhance the capacity of local communities to function as nature guides. This includes training to discharge specialized tasks such as tourist guides, natural science interpreters, patrol partners, entrepreneurs for small scale homestead-based hospitality industry, etc. However, there is no provision for capacity building of local communities in the State policy. In the absence of policy provisions, only Dangs (North) Forest Division of the Department imparted/ facilitated capacity building trainings on nature interpretation, nature guide training, tourism site management and wildlife training during 2016-17 to 2019-20 whereas no such trainings were imparted/ facilitated by the other test-checked Divisions.

In view of the above, the State Ecotourism Policy was required to be updated/ modified as per the extant policy of MoEF&CC.

During the exit meeting (October 2022) the Department agreed to the absence of carrying capacity estimation. It further agreed to revise the Eco tourism policy of the State in consultation with the Gujarat Tourism Department.

### **6.4 Development of ecotourism sites within protected areas**

As per Section 2 of the FCA as well as the clarification issued by MoEF&CC in October 2021, development/ construction of facilities of permanent nature, in forest areas for the purpose of ecotourism, is a non-forestry activity which requires prior approval of the Central Government. Moreover, as per Section 33 (a) of the WPA, any construction of commercial tourist lodges, hotels, zoos, and safari parks inside a Sanctuary requires prior approval of NBWL.

Audit observed that 10 ecotourism sites had been developed by the Department within the Jambughoda, Ratanmahal, Shoolpaneshwar, Purna and Jessore Sanctuaries. Out of these, Audit conducted joint site visits (between July and September 2021) of six ecotourism sites situated in four test-checked

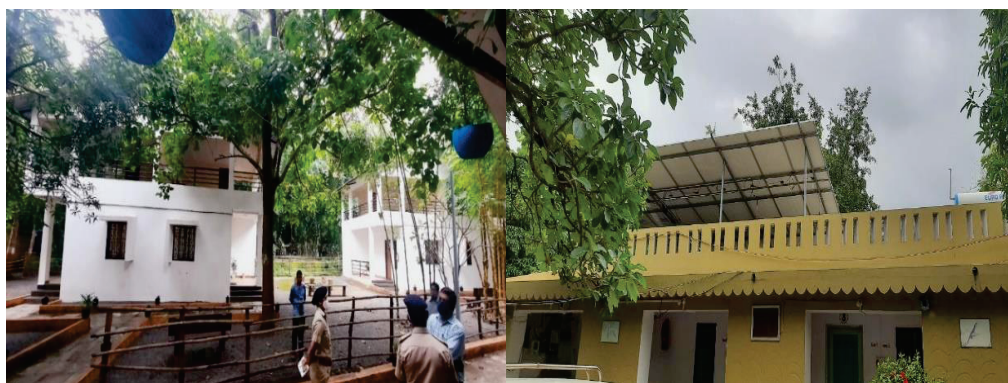
Sanctuaries, and found that permanent structures were established at all these six sites. Details are mentioned in the table below:

**Table 6.2: Ecotourism sites developed within test-checked Sanctuaries as of September 2022**

Sl. No.	Eco tourism site	Year of Construction	Wildlife Sanctuary	Division Name
1	Dhanpari Eco tourism site	2006	Jambughoda	Vadodara wildlife Division
2	Kada dam tent site	2009		
3	Udhal Mahuda Eco tourism site	2009	Ratanmahal	
4	Sagai Eco tourism site	2008	Shoolpaneshwar	Narmada Wildlife division
5	Zarwani eco camp site	2009		
6	Mahal ecotourism camp site	2021	Purna	Ahwa Forest (North) division, Dang

A few of the permanent structures are shown below:

**Photograph 6.1: Permanent structures in Sanctuaries areas noticed during joint site visit between July and September 2021**



**Mahal eco camp site (Purna)**  
Photograph taken on 21 September 2021

**Dhanpari Ecotourism site (Jambughoda)**  
Photograph taken on 30 July 2021

For construction of permanent structures at these ecotourism sites, prior approval of Central Government/ NBWL was required. However, though asked for (October 2021) in Audit, the concerned Divisions did not furnish (as of November 2022) the details of approvals obtained, from the Central Government/ NBWL. In the absence of the same, it could not be ascertained whether the requisite approvals under FCA/ WPA were obtained before undertaking construction at all these ecotourism sites.

The Department did not provide the details of necessary approvals from the Central Government/ NBWL for establishing these sites (November 2022).

## 6.5 Tourism/ pilgrimage in the Sanctuaries

The six test-checked Sanctuaries are being visited by both tourists and pilgrims. The average number of tourists who visited these Sanctuaries annually during 2016-21 is tabulated below:

**Table 6.3: Average number of tourists visited in the test-checked Sanctuaries on an annual basis during 2016-21**

Name of the Sanctuary	Jessore	Balaram Ambaji	Jambu ghoda	Ratan mahal	Shool paneshwar	Purna
Average number of tourists	2,053	0	29,460	16,063	33,018	31,134

Source: Information furnished by the jurisdictional Division.

The Department informed that four out of the six test-checked Sanctuaries<sup>5</sup> collected an aggregate amount of ₹ 3.79 crore towards entry fees, boarding and lodging charges and food charges etc. during 2016-21. In respect of Balaram Ambaji Sanctuary, the Department stated that no ecotourism facility existed in the Sanctuary, hence there was no collection of entry fees etc. while information in respect of Shoolpaneshwar Sanctuary was not furnished to Audit (November 2022).

Audit noticed that there are a few temples of prominence situated inside and outside three out of six test-checked Sanctuaries, namely Jessore, Balaram Ambaji and Jambughoda. The names of these pilgrim sites and approximate average number of tourists/ pilgrims visiting these places annually during the years 2016-21 is given in the table below:

**Table 6.4: Pilgrim sites and approximate average number of tourists/ pilgrims on an annual basis during 2016-21**

Name of the temple	Kedarnath temple	Muni ni kutia	Zand Hanuman	Ambaji Temple	Balaram Mahadev Temple
Name of the Sanctuary	Jessore	Jessore	Jambughoda	Outside Balaram Ambaji	Outside Balaram Ambaji
Annual average number of tourists/pilgrims	4,800	4,800	83,000	25-30 lakh	50-60 thousand

Source: Information furnished by the jurisdictional Division.

<sup>5</sup> Jessore, Jambughoda, Ratanmahal and Purna.

The MEE report (2015-17) for Balaram Ambaji Sanctuary, identified the huge number of pilgrims and their defecation in the forest along the water sources as one of the management weaknesses which posed a threat of diseases to the wild animals and staff. Banaskantha Forest Division stated (January 2021) that the crowd was managed by Sanctuary staff to ensure wildlife protection and avoid human animal conflicts. It was also stated that plastic was banned in the Sanctuary area and other solid wastes were removed by NGOs, Temple trust, visitors, and local people.

During the joint site visit with jurisdictional RFO/ Foresters between July 2021 to September 2021, Audit observed that there was scope of improvement in the regulation of tourism/ pilgrimage activities in the Sanctuaries area and their surroundings. These are discussed in the succeeding paragraphs.

### 6.5.1 Pilgrimage at Zand Hanuman Temple

MEE Report (2017-18) of Jambughoda Sanctuary pointed out absence of a plan to manage visitors of the Zand Hanuman temple to reduce impact on Sanctuary. The Report suggested preparation of an ecotourism plan to address high number of pilgrims visiting the temple and ways of reducing its impact on the wildlife. However, the Department did not prepare any such plan as of October 2022. Further, the NBWL, while according approval (October 2005) under WPA for construction of 'Bobdakuva-MotaRaska-Lambhiya-Zand Hanuman Road' imposed various conditions, the compliance of which was to be ensured by the PCCF (WL) and the concerned DCF.

During joint site visit (August 2021) with jurisdictional RFO, Audit observed non-compliance of certain conditions of NBWL as mentioned in the table below:

**Table 6.5: Status of Compliance to conditions of approval order for construction of road as on August 2021**

Condition Number	Requirement	Status of implementation as observed during joint site visit and its likely impact
2	A check post was required to be created at village Lambhiya, where the road enters/ exits the wildlife Sanctuary.	No check post was established at Lambhiya. Absence of a check post is likely to result in unregulated inflow of pilgrims causing disturbance to the wildlife in the Sanctuary area.
5	The Zand Hanuman temple trust did not have right to make additions to the existing built-up structures. Temple boundary was to be fixed with reference to construction and area was to be demarcated on ground as well as on maps.	The required demarcation was neither done on ground nor on maps. In the absence of demarcation of the temple boundary, there is possibility of unauthorized expansion and/ or encroachment in the nearby Sanctuary area.  The Department stated (November 2022) that enumeration of existing shops had been done and no new shops would be allowed in future. However, no remarks

Condition Number	Requirement	Status of implementation as observed during joint site visit and its likely impact
		were offered regarding demarcation of the temple boundary.
7	The DCF was required to supervise the use of temple funds collected from pilgrims to ensure that proportion of funds are being spent on solid waste management, clean water, toilet, and clean food facilities.	Improper solid waste management was observed. Coconut husk was being piled and burnt by the vendors in the temple campus. Solid waste piled in the surrounding area of the temple campus. This may have both physical and toxicological implications on wildlife of the Sanctuary beside risk of forest fire.
8	The wildlife Sanctuary manager was required to ban use of plastic in wildlife Sanctuary and put suitable notices for this purpose all along the road and at the check post.	Though a ban on plastic in Sanctuary area was in place, Audit did not observe any noticeboard along the road and temple campus regarding the same. This implied that both the pilgrims and the vendors were not sensitized regarding ban on plastic usage. Audit noticed plastic bags littering in the Sanctuary area. The lack of effective implementation of ban on plastic may add to pollution, adversely affecting the wildlife.  The Department stated (November 2022) that temple trust and village head had been sensitized regarding environment and ecology of surrounding areas and assurance had been obtained from the temple trust to ensure cleanliness in the temple surroundings.

The following photographs depicts improper solid waste management in the Jambughoda Sanctuary.

**Photograph 6.2: Coconut husk piled and being burnt near the Zand Hanuman Temple in Jambughoda Sanctuary**



Source: Photograph taken during joint site visit on 30 July 2021.


Thus, non-compliance of the conditions imposed by NBWL reflects that the road as well as the pilgrim site needs to be properly monitored and managed.

## 6.5.2 Waste Management

Garbage dumping has both physical and toxicological implications on animal life. Plastics present in garbage gets ingested by wild animals, leading to lethal injuries and damage to digestive tract which results in starvation, ulceration of stomach, premature death, etc. Thus, management of waste is very important for wildlife conservation.

The observations in respect of waste management in three test-checked Sanctuaries as noticed during joint site visits (between July to September 2021) are detailed in the following table:

**Table 6.6: Waste management in Sanctuaries**

<b>1. Shoolpaneshwar:</b>	
No dustbins had been provided at the designated bus stop for ferrying tourists to Zarwani Adventure tourism site and thermocol plates were found littered in the nearby area.	
<b>2. Ratanmahal:</b>	
At Nagada Camp Site, garbage including plastics, food packets, cans of cold drinks and plastic bottles were found scattered.	
<b>3. Purna:</b>	
At Mahal Ecotourism site, the pit dug for temporary storage of waste was overflowing with solid plastic waste, banned inside the Sanctuary.	<p><b>Photograph 6.3: Solid waste including plastic overflowing the open pit adjacent to Mahal Eco tourism</b></p>  <p>Source: Photograph taken during joint site visit on September 2021</p>

Hence, there was a need for proper waste management policy in the Sanctuaries. This will keep wildlife safe from the harmful effects of waste.

The Department stated (November 2022) that plastic items were being collected at the entry of the Ratanmahal Sanctuary while in Purna Sanctuary, plastic had been prohibited and necessary boards and signage established for awareness. In case of Shoolpaneshwar Sanctuary, the Department did not offer any remark.



### **6.5.3 Regulating tourism activities during mating and regeneration periods of wildlife**

It is a well-established fact that wildlife should not be disturbed during its mating and regeneration periods and therefore keeping Sanctuaries open all through the year would prove detrimental to the conservation of the wildlife. Further, ban on tourist activities during these seasons would also facilitate forest staff to concentrate fully on management issues of the Sanctuaries.

All the six test-checked Sanctuaries were open to tourists throughout the year. During joint site visit, Audit also observed that the daily timings were not being enforced in the Shoolpaneshwar Sanctuary. Even though tourists were not allowed inside the Sanctuary after sunset, Audit noticed (September 2021) that tourists were present inside the Sanctuary even at dusk.

**Photograph 6.4: Tourists during dusk (6.45 PM) in the Piplod Range of Shoolpaneshwar Sanctuary**



Source: Photograph taken during joint site visit on 08 September 2021.

Thus, daily timings prescribed for tourist visit in the Sanctuary area were not being enforced. This may adversely affect the wildlife in the Sanctuary area.

### **6.5.4 Lack of site-specific ecotourism plans and unregulated tourism activities**

The current management plans in respect of the six test-checked Sanctuaries were framed after the formulation of the Gujarat Ecotourism Policy 2007. However, the Management Plans of these Sanctuaries did not have site-specific ecotourism plans for regulation of the tourism activities within the Sanctuaries as provided in the policy.

Audit observed (November 2021) that the Department neither devised any monitoring mechanism for regulated access nor fixed the carrying capacity of the respective Sanctuary based on scientific study as required in the Gujarat Ecotourism Policy. In the absence of such plans/ monitoring mechanism, there was no ceiling on the number of visitors and vehicles entering the Sanctuaries.

Further, the impact of tourism on the natural environment and pollution was not monitored. This could have an adverse effect on wildlife in the Sanctuaries.

The Department agreed (November 2022) to prepare site specific ecotourism plans.



**Ahmedabad**  
**The 14-08-2023**

**(VIJAY N. KOTHARI)**  
**Accountant General (Audit-II), Gujarat**

*Countersigned*



**New Delhi**  
**The 16-08-2023**

**(GIRISH CHANDRA MURMU)**  
**Comptroller and Auditor General of India**



## Appendix I

(Reference: Paragraph No. 2.5.3.2)

### Status of maintenance of Control Forms/ PA and Range Books/ Compartment History (July to October 2021)

1 and 2: Balaram Ambaji and Jessore		
Control Forms	PA and Range Books	Compartment History
Though prescribed in the previous Management Plan <sup>1</sup> of Balaram Ambaji sanctuary, the new Management Plans for the period 2021-22 to 2030-31 for both the Sanctuaries under the jurisdiction of same Division did not have the provision of maintaining control forms. Although the 'contents' portion of the management plans stated that Appendix XXIII contained the control forms, no such Appendix formed part of the approved Management Plans. This was indicative of lack of proper scrutiny before approval of the Management Plans.	The new management plans did not have the provision of maintenance of PA and Range Books.	The new management plans did not provide for maintenance of compartment history.
3: Jambughoda		
Control Forms	PA and Range Books	Compartment History
The format of control forms was prescribed in the Management Plan.	Provided for maintenance of PA and Range Books.	Provided for maintenance of compartment history without prescribing any formats.
4: Ratanmahal		
Control Forms	PA and Range Books	Compartment History
Though stipulated for maintenance of control forms in the existing formats prescribed under the working plan code with suitable modification, no precise formats were approved subsequently. Incidentally, the format of control forms was prescribed in the Management Plan for Jambughoda sanctuary which falls under the jurisdictional control of the same Division/ Circle Office. Thus, the two Sanctuaries under the jurisdiction of same authorities were being managed differently.	Provided for maintenance of PA and Range Books.	Did not provide for maintenance of compartment history.
5: Shoolpaneshwar		
Control Forms	PA and Range Books	Compartment History
The Management Plan stipulated maintenance of control forms at the Division office and at the Range office. However, the format of the control forms was not prescribed and annexed in the Management Plan. This indicated lack of due scrutiny while approving the Management Plan.	Provided for maintenance of PA and Range Books.	Provided for maintenance of compartment history without prescribing any formats.

<sup>1</sup> Balaram Ambaji: 2002-03 to 2006-07.

<b>6: Purna</b>		
<b>Control Forms</b>	<b>PA and Range Books</b>	<b>Compartment History</b>
Format of control forms and physical/financial targets for the plan period were prescribed in the approved Management Plan. However, those were not included in the final printed version of the Management Plan available at the Division. This indicated lack of due care in publishing and printing of the Management Plan. Further, this was also detrimental to the achievement of management prescriptions contained in the Management Plan as field and Divisional staff were not having knowledge of the same.	Provided for maintenance of PA Book only.	Provided for maintenance of compartment history in prescribed formats.

## Appendix II

(Reference: Paragraph No. 3.4)

### Observations on boundary demarcation and digitization of Sanctuaries

Sl. No.	Provision	Observation	Conclusion
1	The Management Plans, while highlighting the issues of poor maintenance of demarcation register and encroachment of the sanctuary, prescribed for maintenance and regular updation of demarcation register in offices of RFO and DCF showing the actual position of demarcation of the boundary of sanctuary.	Banaskantha, Narmada and Ahwa (North) Divisions neither properly maintained nor timely updated the details of demarcation of the boundary of the respective forest area. Only range-wise number of boundary pillars (A Class and B class) erected in a particular year and expenditure incurred there upon were being recorded. The demarcation registers were not being countersigned by the competent authority. In case of Vadodara Wildlife Division, though data regarding demarcation and maintenance of boundaries of forest area was received from every range office, the division did not maintain any consolidated demarcation register to reflect the actual position of the whole forest area.	The Divisions did not take cognizance of the provisions of the Management Plans and the demarcation registers were not being maintained properly and updated on regular basis. The jurisdiction of four Divisions covering the six Sanctuaries also includes territorial forests which are not a part of the respective sanctuary. The sanctuary area enjoys more protections than surrounding forest areas. Divisions kept only a single demarcation register for both sanctuary as well as forest area falling under its jurisdiction which were also not being properly maintained. Absence of clear demarcation of the sanctuary both in records and on land could affect the proper management of the sanctuary.
2	As per the National Action Plan on Forest Fire brought out by MoEF&CC, in absence of digitized boundaries in many forests across the country, the Forest Survey of India (FSI) screens fire detection using approximations leading to reduced efficacy of the alert system. It also emphasized to digitize the location of critical resources and assets such as watch towers, ground crew stations, control rooms and forest fire lines as well as important infrastructure such as roads, railways, and natural resources such as water bodies and natural fire breaks that could assist in preparedness and planning for response to forest fires. The Supreme Court of India (SCI) also underlined the importance of digitization of data regarding forest and wildlife and issued various guidelines vide its order dated 06 July 2011.	The Department was using manual graphic records for mapping, and it lacked GPS locations of boundaries, fire lines, water bodies, roads, core zone, wildlife corridors and sanctuary land diverted. In cases, while processing application MoEF&CC asked for the details of land diverted for non-forest purpose in past, the Department provided manual data which may not reflect the actual position of diverted land and status of compliance to the conditions imposed during approvals granted. Further, Circle Office did not take action to replace the existing manual graphic records with geo referenced digital map of sanctuary area though Vadodara Wildlife Division provided (September 2017) the GPS coordinates of each boundary cairn. Moreover, out of the four selected divisions, only Banaskantha Division issued (February 2021) work order for survey, demarcation, and	The Forest Department had not developed any GIS based decision support database even after lapse of 10 years since pronouncement of guidelines by the SCI. The non-availability of such a scientific and technical decision supporting database may reduce the efficiency of monitoring of the compliance to the conditions imposed while granting permissions for non-forest purposes, as monitoring officer always needs to go through respective manual files.

Sl. No.	Provision	Observation	Conclusion
		digitization of the boundary of Forest Areas for creation of updated geo referenced digital map through joint certification of land records with revenue authorities. However, the work order did not cover the digitization of forest assets and fire lines.	
3	Divisions submit status of demarcation and maintenance of boundary of the sanctuary in Statement No. 3 annually for Annual Administrative Report prepared by PCCF Office, which consists of details like “boundary newly demarcated during the year, repair of previously demarcated boundary during the year, previously demarcated boundary not repaired during the year, total boundary demarcated and length of boundary yet to be demarcated at close of the year”.	Divisions did not submit complete information. The progressive details like total length of boundary demarcated and length of boundary remaining to be demarcated at closing of the year, were not being furnished.	The Statements furnished by the respective divisions did not present a holistic and progressive picture of the demarcation status of the boundary of the sanctuary under their jurisdiction. Absence of the required details would function as a limitation for the concerned authority in planning for future work for proper demarcation of the sanctuary to avoid encroachment and conflict with local people.
4	Management Plans of Shoolpaneshwar, Balaram Ambaji and Jessore Sanctuaries proposed strategies for strengthening the protection against encroachment and stipulated that every year ACsF will check 25 per cent of boundaries of the sanctuary under their jurisdiction while RFOs, Foresters and Forest Guards will check 100 per cent. Every RFO is required to submit an annual Range Survey and Demarcation Report which is required to include the details of surprise and routine checks done in the range. Similarly, Chapter 12.2.3 of the Management Plan (Period 2014-15 to 2023-24) of Purna Sanctuary states that demarcation has to be periodically checked and reports shall be submitted by all officers and staff periodically to the DCF. The plan stressed that regular compartment checking and vigilance in pre-monsoon period would be helpful in preventing seasonal encroachment.	Except Management Plan of Shoolpaneshwar, no other management plan had prescriptions for mandatory foot patrolling for the officers and ground staff. The Management Plans of Jambughoda and Ratanmahal Sanctuaries had no provision for surprise and/ or routine checking of boundaries and submission of annual report. Further, in spite of provision for checking and submission of reports in respect of demarcation of boundaries of the other four sanctuaries, no such reports were being submitted by any RFO/ ACF to the jurisdictional Division.	The boundary of the sanctuaries was not being monitored to ensure their inviolability and avoid conflict with local populace and to better manage the wildlife.
5	Standing Instruction Number 1 dated 21 July 2016 issued by the PCCF (WL) <i>inter alia</i> states that due to several reasons (including implementation of FRA) the	Divisions were not following the above instruction and did not submit prescribed annual reports to higher authority though Vadodara Wildlife	In absence of adherence of the standing instruction, the checking of present status of boundaries demarcation and necessary repairs could not be

---

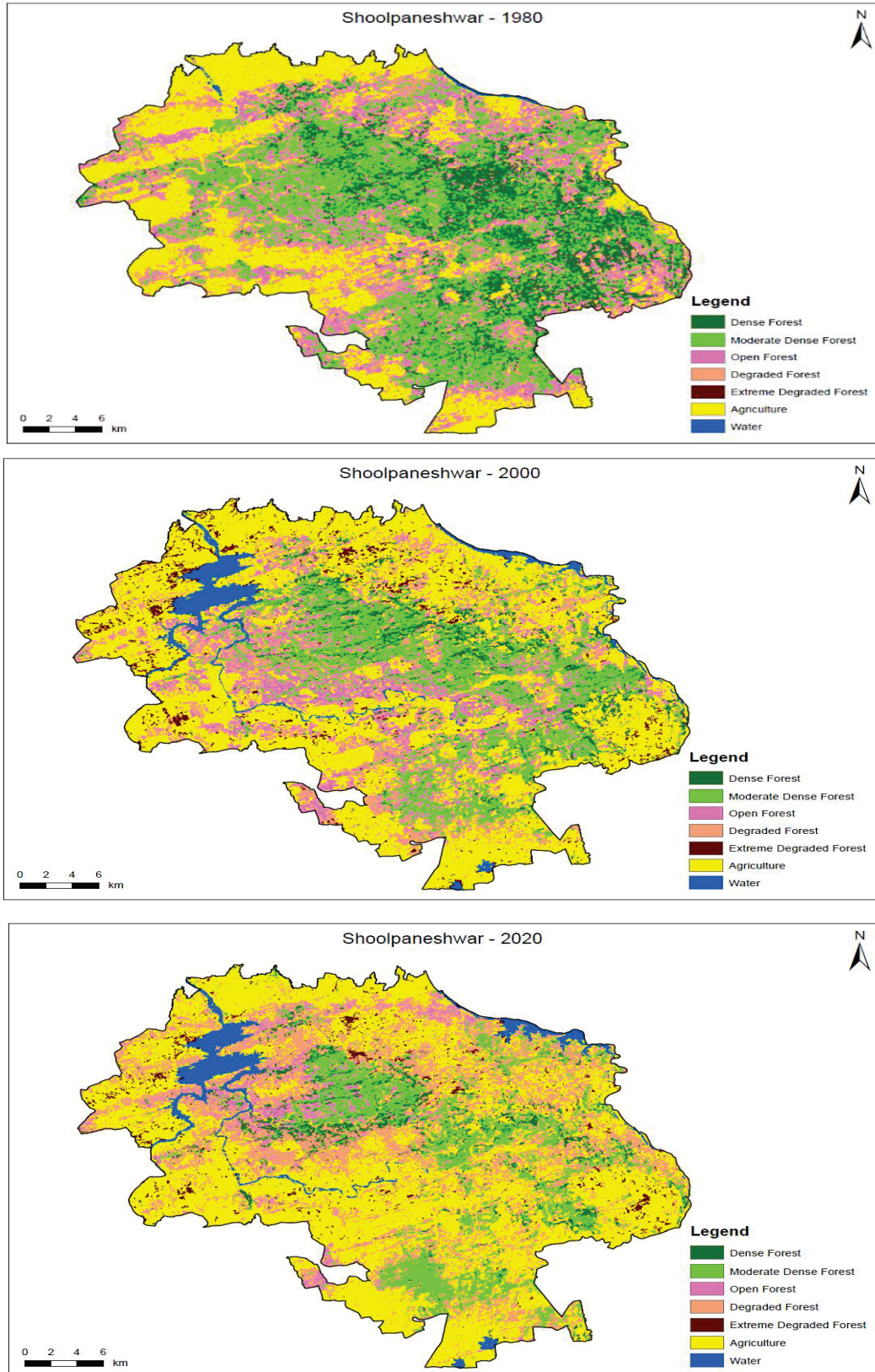
Sl. No.	Provision	Observation	Conclusion
	exact situation of forest boundaries is not known, as such the possibility of encroachments is increased. Thus, necessary checking of the boundaries and its reporting at Division/ Circle and State Level was prescribed. Also, regular checking of status of boundaries and recording the GPS coordinates of the boundary pillars was stipulated. This was to be done from beat guard level to DCF level and its reporting was to be done to APCCF level each year.	Division did partially check boundaries in the year 2016. No such work was done in the subsequent years while Narmada Forest Division cited shortage of GPS devices for non-compliance of the standing instructions.	ensured.



### Appendix III

(Reference: Paragraph No. 3.5.1.1)

#### Trend of increasing agriculture in Shoolpaneshwar Sanctuary



Source: LULC Report of SAC (ISRO), Ahmedabad.

## Appendix IV

(Reference: Paragraph No. 4.2)

### Details of Invasive Alien Species, their effects and remedial action needed (as on 31 March 2021)

Sl. No.	Sanctuary	Invasive Alien Species	Effect observed as per Management Plan	Remedial Action recommended/ proposed
1	Jessore	<ul style="list-style-type: none"> <li>• <i>Prosopis Juliflora</i></li> <li>• <i>Prosopis Chilensis</i></li> <li>• <i>Lantana camara</i></li> </ul>	<ul style="list-style-type: none"> <li>• Invaded 30-35 % of the total forest growth.</li> <li>• Inhibited natural regeneration- even grasses are unable to come up in areas invaded and natural species have dried.</li> <li>• Has converted the plain land into thorn forest.</li> <li>• Damage to the prime forest, degradation of habitats and decline of wildlife populations.</li> <li>• Has adverse effect on the productivity of Forest Minor Produce (FMP), which is important for local communities' livelihood.</li> </ul>	GEER Report and MEE Report 2017-18: Total removal of invasive species.
2	Balaram Ambaji	<ul style="list-style-type: none"> <li>• <i>Prosopis Juliflora</i></li> <li>• <i>Lantana camara</i></li> <li>• <i>Acacia Tortilis</i></li> </ul>	Threat to local plant species.	MEE Report 2016-17: Removal of <i>Prosopis</i> and <i>Lantana</i> and planting of native fruit-bearing trees.
3	Jambughoda	<ul style="list-style-type: none"> <li>• <i>Prosopis Juliflora</i></li> <li>• <i>Lantana camara</i></li> <li>• <i>Ipomoea</i></li> <li>• <i>Eucalyptus hybrid</i></li> <li>• <i>Acacia Tortilis</i></li> </ul>	Loss of habitat for wild animals.	Management Plan: <ul style="list-style-type: none"> <li>• Removal of 50 Ha of invasive species per year and stoppage on plantation of these species in future</li> <li>• Plantation of edible species (50 Ha per year) and gap planting species (50,000 plants per year).</li> </ul>
4	Ratanmahal	<ul style="list-style-type: none"> <li>• <i>Lantana camara</i></li> </ul>	Non-palatable	Management Plan: <ul style="list-style-type: none"> <li>• 100 Ha of invasive species to be removed per year.</li> <li>• Promotion of rotational grazing and undertaking plantation of fodder species to fulfil the needs of sloth bear.</li> <li>• Habitat enrichment plantation in core zone (8 Ha per year) and improvement of grasses (1 Ha per year) and</li> </ul>

Sl. No.	Sanctuary	Invasive Alien Species	Effect observed as per Management Plan	Remedial Action recommended/ proposed
				regeneration (250 Ha per year).
5	Shoolpaneshwar	<ul style="list-style-type: none"> <li>• <i>Parthenium</i></li> <li>• <i>Lantana camara</i></li> </ul>	Infesting grasslands.	Management Plan: <ul style="list-style-type: none"> <li>• Cleaning of 170 Ha per year (totaling 850 Ha from 2016-21).</li> <li>• Planting grass (330 Ha), fruit/ fodder/ rare and endangered species (1,280 Ha), bamboo plantation (750 Ha) and browsable species improvement (852 Ha) during 2016-17 to 2020-21.</li> </ul>
6	Purna	<ul style="list-style-type: none"> <li>• <i>Cassia Tora</i></li> <li>• <i>Lantana camara</i></li> </ul>	Non-palatable	Management Plan: <ul style="list-style-type: none"> <li>• Ketki planting (125 Ha), Fodder Plots (400 Ha), Miscellaneous plantation (120 Ha), Slivi pasture development (100 Ha) during 2016-17 to 2020-21.</li> </ul>

Source: Management Plan of the sanctuary / Report published by GEER / MEE Reports/ 'Protected Areas and Natural Heritage of Gujarat'- a Book.

## Glossary of Important Terms

Sl. No.	Term	Meaning
1	Alien species	A species that is not native to the ecosystem in which it is introduced.
2	Anthropogenic	Of, relating to, or resulting from the influence of humans on nature.
3	Biogeographical Region/ Zone	An area of animal and plant distribution having similar or shared characteristics throughout.
4	Biological corridor/ Wildlife Corridor	Area of suitable habitat, or habitat undergoing restoration, linking two or more protected areas (or linking important habitat that is not protected) to allow interchange of species, migration, gene exchange, etc.
5	Biotic (factors)	Belonging to, or caused by, the living organisms e.g. grazing.
6	Canopy cover	The proportion of the forest floor shielded by the leaves and branches of the trees.
7	Carrying Capacity	The amount of use that an area can sustain- for recreation, for wildlife etc., without deteriorating in its quality and become unsustainable.
8	Catchment	The area drained by a river or body of water/ An area that collects and drains precipitation.
9	Community Reserve	The State Government may, where the community or an individual has volunteered to conserve wild life and its habitat, declare any private or community land not comprised within a National Park, Sanctuary or a Conservation Reserve, as a Community Reserve, for protecting fauna, flora and traditional or cultural conservation values and practices under Section 36 C of the Wildlife Protection Act 1972.
10	Conservation Reserve	The State Government may, after having consultations with the local communities, declare any area owned by the Government, particularly the areas adjacent to National Parks and Sanctuaries and those areas which link one protected area with another, as a Conservation Reserve for protecting landscapes, seascapes, flora and fauna and their habitat under Section 36 A of the Wildlife Protection Act, 1972.

11	Critical Wildlife Habitat	Such areas of National Parks and Sanctuaries where it has been specifically and clearly established, case by case, on the basis of scientific and objective criteria, that such areas are required to be kept as inviolate for the purposes of wildlife conservation, as may be determined and notified by the MoEF&CC after open process of consultation by an Expert Committee.
12	Degraded	Reduction or loss of biological or economic productivity of the land.
13	Ecotourism	A form of tourism focused on the discovery of cultural and natural heritage and committed to respecting the environment while contributing to the well-being of local people.
14	Endangered	When used in the context of the IUCN Red List, a taxon is classified as Endangered when there is very high risk of extinction in the wild in the immediate future (IUCN, 2001).
15	Environmental impact	The measurable effect of human action over a certain ecosystem.
16	Eradication	The complete removal of all living representatives of a species that is becoming (or is likely to become) invasive in a specified area or country.
17	Fauna	The community of animals peculiar to a region, area, specified environment or period.
18	Flagship species	Popular charismatic species that serve as symbols to stimulate conservation awareness and action locally, nationally, regionally or globally.
19	Flora	Flora is all the plant life present in a particular region or time, generally the naturally occurring (indigenous) native plants.
20	Fragmentation	The breaking up of a habitat, ecosystem or land-use type into smaller, often isolated, parcels, thereby reducing the number of species that the habitat, ecosystem or land-use type can support.
21	Genes	Elements in all living things that carry hereditary characteristics, which, when expressed, make each individual different from all others.
22	Genetic diversity	Variety of genes or sub-specific genetic varieties.
23	Geographic Information System (GIS).	An organized collection of computer hardware, software, geographic data, and personnel designed to efficiently capture, store, update, manipulate, analyse, and display all forms of geographically referenced information.
24	Habitat	The locality or environment in which an animal lives includes land, water or vegetation.
25	Habitat degradation	A decline in habitat quality for a species, e.g. related to changes in food availability, cover, or climate.

26	Habitat loss	An area that has become totally unsuitable for a species.
27	Habitat management	Management activities involving vegetation, soil and other physiographic elements or characteristics in specific areas, with specific conservation, maintenance, improvement or restoration goals.
28	Herbivore	A plant eater.
29	Impact mitigation	Measures and actions taken to avoid, minimise, reduce, remedy and/ or compensate for the adverse impacts of development. In general, a hierarchy of ‘avoid – reduce – remedy – compensate’ is used to establish an order of preference (beginning with avoid) for mitigation measures.
30	Introduction	Introduction of an organism is the intentional or accidental dispersal by human agency of a living organism outside its historically known native range (IUCN, 1987).
31	Invasion	Species invasion or biological invasion is the action of an invasive species as its population increases in size and spread and begins to have negative impacts on the ecosystem it has entered.
32	Invasive species	This refers to a subset of introduced species or non-native species that are rapidly expanding outside of their native range. Invasive species can alter ecological relationships among native species and can affect ecosystem function and human health.
33	Land cover	The physical coverage of land, usually expressed in terms of vegetation cover or lack of it. The human use of a piece of land for a certain purpose influences land cover.
34	Land use and land use change	Land use refers to the total of arrangements, activities, and inputs undertaken in a certain land cover type (a set of human actions). The term land use is also used in the sense of the social and economic purposes for which land is managed (e.g., grazing, timber extraction, and conservation). Land use change refers to a change in the use or management of land by humans, which may lead to a change in land cover.
35	Landscape	A geographical mosaic composed of interacting ecosystems resulting from the influence of geological, topographical, soil, climatic, biotic and human interactions in a given area.
36	Local extinction	When there is no doubt that the last individual of a particular species has died from a defined region or area.

37	Management effectiveness	How well a protected area is being managed – primarily the extent to which it is protecting values and achieving goals and objectives.
38	Monitoring & Evaluation (M&E).	Monitoring focuses on tracking inputs, outputs, outcomes and impacts as interventions are implemented. Evaluation assesses the efficiency and impact of interventions (typically after they have been implemented). Together M&E allows policy-makers to track results, suggest corrections or improvements during implementation, and assess success.
39	Population study	Study about the local populations of a species, in order to appraise and assess the size and density of the population, its numbers by sex and age, birth, death and growth rates, as well as the number of individuals that may be serviceable during a certain period of time, without affecting the resource and its long-term productive potential.
40	Protected Forest	The forest declared to be reserved by the State Government under Section 29 of the Indian Forest Act, 1927, or declared as such under any other State Act.
41	Re-introduction	The release of individuals into a formerly occupied area after the native population have become extinct.
42	Remedial action	Actions taken to remedy or correct a situation, to return something to its previous or proper state.
43	Remote sensing	Methods for gathering data on a large or landscape scale which do not involve on-the ground measurement, especially satellite photographs and aerial photographs; often used in conjunction with Geographic Information Systems.
44	Reserve Forest	The forest declared to be reserved by the State Government under Section 20 of the Indian Forest Act, 1927 or declared as such under any other State Act.
45	Soil moisture	Water stored in or at the land surface and available for evapotranspiration.
46	Sustainable development	Means using natural resources in a way that avoids irreversible damage to ecosystem structure and function, the loss of irreplaceable features or a reduction in ecosystem resilience.
47	Threatened species	Any species which is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.
48	Unclassed Forest	Any forest land or waste land or any other land “recorded” in land records as “forest” but not notified in Government gazette as “reserved” or “protected” forests under Indian Forest Act.

49	Working Plan	Working Plan is the main instrument of forest planning (more exactly forest working) for scientific management of forests. It is a very useful document for evaluating the status of forests and biodiversity resources of a forest division, assessing the impact of past management practices and deciding about suitable management interventions for future.
----	--------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------





© **COMPTROLLER AND  
AUDITOR GENERAL OF INDIA**  
[www.cag.gov.in](http://www.cag.gov.in)

<http://cag.gov.in/ag2/gujarat/en>