



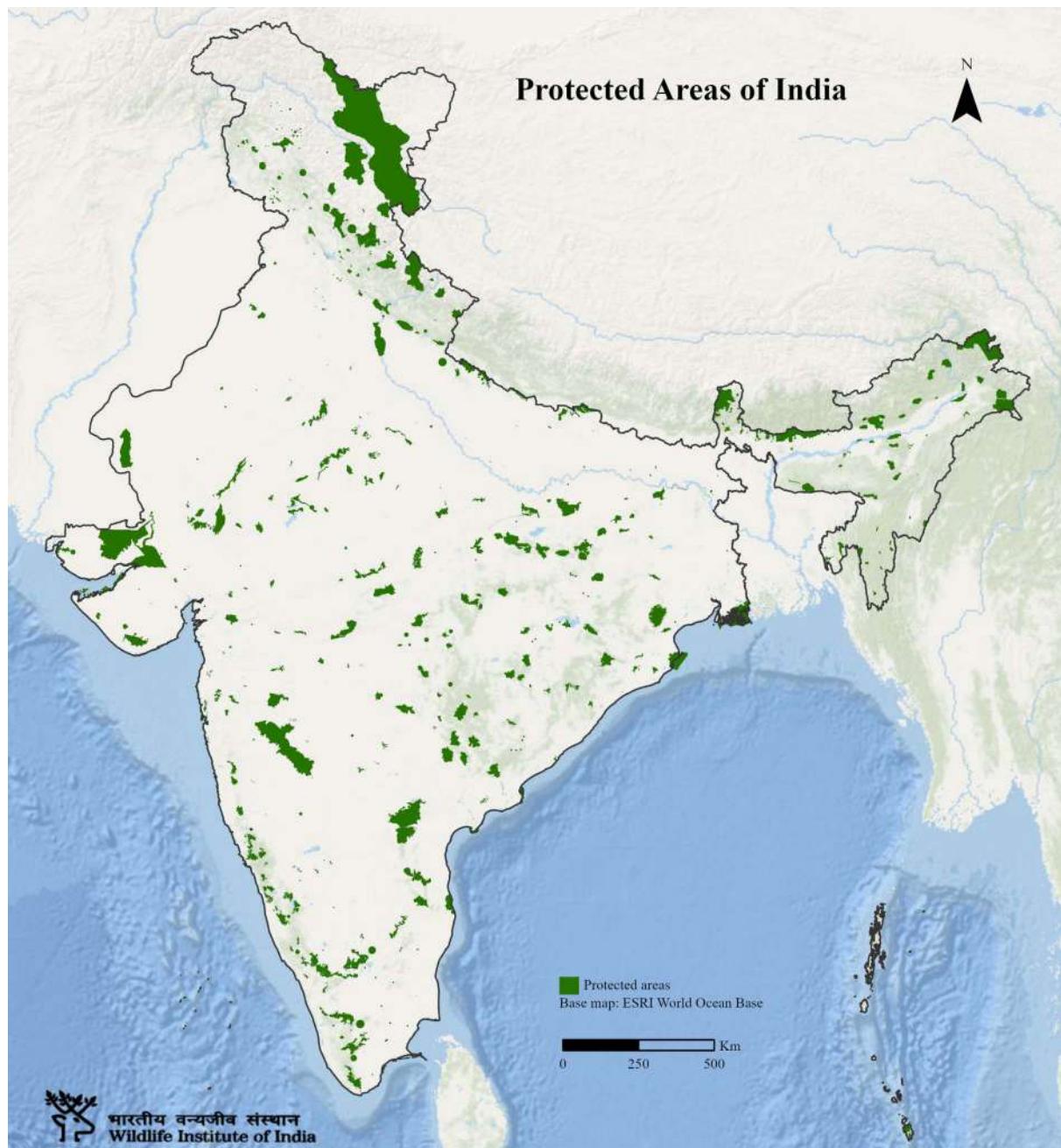
2020-2025

MANAGEMENT  
EFFECTIVENESS  
EVALUATION OF  
**438**  
NATIONAL PARKS  
AND WILDLIFE SANCTUARIES  
IN INDIA









भारतीय बन्यजीव संस्थान  
Wildlife Institute of India

#### PROJECT TEAM

Dr. Gautam Talukdar, Project Investigator & Scientist-F, WII  
 Dr. Avilekh, Project Scientist II, WII  
 Dr. Nasim Ahmad Ansari, Former Project Scientist, WII  
 Ms. Ananya Das, Project Associate II  
 Ms. Anindita Debnath, Project Associate II  
 Ms Deepali Bansal, Former Office Assistant  
 Sh. V.K. Uniyal, Subject Matter Specialist & Former PCCF, Kerala

#### PROJECT ADVISORS

Sh. Sushil Kumar Awasthi, Director General of Forest & Special Secretary MoEF&CC  
 Sh. Virendra R Tiwari, Director, WII  
 Sh. Sunil Sharma, Joint Director-Wildlife, MoEF&CC  
 Sh. Soumitra Dasgupta, Former Additional Director General of Forest (Wildlife), MoEF&CC  
 Dr S.P. Yadav, Former Additional Director General of Forest (Wildlife), MoEF&CC  
 Dr. Dhananjai Mohan, Former Director, WII  
**Independent Regional Expert Committees (RECs) : Annexure I**

#### About Wildlife Institute of India (WII)

The Wildlife Institute of India (WII) is an autonomous institution under the Ministry of Environment, Forest and Climate Change, Government of India. Established in 1982, WII is an internationally recognized institution offering training programs, academic courses, and policy advisory services in wildlife research and management. The Institute is actively engaged in innovative research across biodiversity-related disciplines.

#### Disclaimer

The information presented in this publication is intended for planning academic and research purposes with due credit to the Wildlife Institute of India and the Ministry of Environment, Forest and Climate Change, Government of India. The content reflects assessments and findings based on the available data. The organizations assume no responsibility for any errors or interpretations arising from the use of this document.



मंत्री  
पर्यावरण, वन एवं जलवायु परिवर्तन  
भारत सरकार



MINISTER  
ENVIRONMENT, FOREST AND CLIMATE CHANGE  
GOVERNMENT OF INDIA



## Message

I am delighted to announce that India has successfully completed the repeat cycle of Management Effectiveness Evaluation (MEE) for its National Parks and Wildlife Sanctuaries. This evaluation, conducted since 2006, follows the globally recognized framework developed by the IUCN's World Commission on Protected Areas. The exercise has yielded invaluable insights into the effectiveness of conservation efforts across these protected areas. The criteria and indicators used have been carefully adapted to align with Indian conditions, reflecting the diverse ecological, geographical, and cultural contexts of each National Park and Wildlife Sanctuary. The MEE score is derived from a comprehensive assessment of various factors, including the performance and management of these protected areas over time.

The first cycle of MEE covered 442 National Parks and Wildlife Sanctuaries, with an average score of 60.52%. The repeat cycle, covering 438 National Parks and Wildlife Sanctuaries, showed an improvement in management effectiveness, with the average MEE score increasing to 64.41%. This upward trend highlights the sustained efforts in enhancing the management of our protected areas. Additionally, the 113 Coastal and marine protected areas (CMPAs) are taken up for evaluation marks another milestone in strengthening conservation frameworks in India.

MEE scores are valuable for tracking progress over time for individual a PA, informing management decisions, and promoting adaptive management for continuous improvement and should not be compared between different sites, as each PA has its unique context and challenges.

This progress reaffirms our commitment to Target 3 of the Kunming-Montreal Global Biodiversity Framework (KMGBF), which calls for ensuring that 30% protected and conserved areas are effectively managed. India is setting an example for other countries by institutionalizing MEE as a standard practice, demonstrating that we can lead the way in conservation management on a global scale.

I extend my heartfelt congratulations to all the team members involved in this significant endeavor which has made a profound impact on the conservation landscape of India.

(Bhupender Yadav)



कीर्तिवर्धन सिंह  
KIRTI VARDHAN SINGH



राज्य मंत्री  
पर्यावरण, वन एवं जलवाया परिवर्तन  
विदेश मंत्रालय  
भारत सरकार  
MINISTER OF STATE  
ENVIRONMENT, FOREST AND CLIMATE CHANGE  
EXTERNAL AFFAIRS  
GOVERNMENT OF INDIA

## Message

India is among the select countries in the world that have successfully assessed the management effectiveness of its National Parks and Wildlife Sanctuaries using a globally accepted framework. With the completion of the full repeat cycle of evaluating 438 National Parks and Wildlife Sanctuaries during 2020-2025, India has set a benchmark in conservation management, providing invaluable insights to policymakers, conservationists, and academicians for developing strategies to ensure the long-term survival of our rich biodiversity.

The criteria and indicators for the Management Effectiveness Evaluation (MEE), based on the framework developed by IUCN's World Commission on Protected Areas, have been thoughtfully tailored to reflect the unique ecological, geographical, and cultural dimensions of India's protected areas. The MEE score of each area not only reflects its management practices but also offers insights into its unique context and performance trends over time, helping us refine conservation strategies.

I take this opportunity to commend the immense efforts of the Chief Wildlife Wardens of the States, the field staff, the Wildlife Institute of India, and the Ministry of Environment, Forest and Climate Change for their pivotal roles in achieving this milestone. Their unwavering dedication and commitment have been instrumental in safeguarding India's natural heritage.

The Management Effectiveness Evaluation has become an indispensable tool in improving the management of our National Parks and Wildlife Sanctuaries, helping identify gaps and adopt effective conservation measures. The steady improvement in MEE scores across these protected areas is a testament to the success of our collective efforts.

I extend my heartfelt congratulations to all the stakeholders for their exceptional contributions. I urge you all to continue this commitment and dedication to conserving our wilderness and ensuring the survival of India's diverse flora and fauna for generations to come.

(Kirti Vardhan Singh)

कार्यालय: ५वां तला, आकाश विंग, इंदिरा पर्यावरण भवन, जोर बाग रोड, नई दिल्ली-११०००३, दूरभाष: ०११-२०८१९४१८, ०११-२०८१९४२१, फैक्स: ०११-२०८१९२०७, ई-मेल : mos.kvs@gov.in

Office : 5th Floor, Aakash Wing, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi-110003, Tel.: 011-20819418, 011-20819421, Fax : 011-20819207, E-mail : mos.kvs@gov.in

कार्यालय: कमरा नं. १४१, साउथ ब्लॉक, नई दिल्ली-११०००१, दूरभाष: ०११-२३०११४१, २३०१४०७०, २३७९४३३७, फैक्स: ०११-२३०११४२५, ई-मेल : mos.kvs@gov.in

Office : Room No. 141, South Block, New Delhi-110001, Tel.: 011-23011141, 23014070, 23794337, Fax : 011-23011425, E-mail : mos.kvs@gov.in

निवास: 23, बी.आर. मेहता लेन, नई दिल्ली-११०००१, दूरभाष: ०११-२३८२९७९

Residence : 23, B.R. Mehta Lane, New Delhi-110001, Tel.: 011-23782979

## Virendra Rambahal Tiwari, IFS

Director

Wildlife Institute of India

श्री वीरेंद्र आर. तिवारी, आईएफएस,

निदेशक

भारतीय वन्यजीव संस्थान



### Message

It is with immense pride and satisfaction that I share the successful completion of the repeat cycle of the Management Effectiveness Evaluation (MEE) for India's National Parks and Wildlife Sanctuaries. This landmark achievement underscores our collective commitment to conserving India's rich biodiversity and ensuring the sustainable management of our protected areas.

The Wildlife Institute of India (WII) has been privileged to play a pivotal role in this extensive exercise, which spanned over 438 National Parks and Wildlife Sanctuaries across the country. The MEE framework, rooted in global best practices and meticulously adapted to India's unique ecological and cultural contexts, has provided a robust mechanism to assess and enhance the management effectiveness of these protected areas. The insights gained from this evaluation will serve as a cornerstone for shaping future conservation strategies and addressing emerging challenges.

I would like to extend my heartfelt gratitude to the Ministry of Environment, Forest and Climate Change (MoEF&CC) for their unwavering support and guidance throughout this endeavor. Their vision and commitment have been instrumental in driving this initiative to its successful conclusion. I also extend my sincere appreciation to the Chief Wildlife Wardens, Field Directors, and the dedicated frontline staff of the evaluated protected areas, whose tireless efforts and cooperation have been vital to the success of this exercise.

A special note of thanks goes to the Independent Regional Experts Committees (RECS), whose expertise and meticulous assessments have provided invaluable insights into the management practices and performance trends of our protected areas. I am also grateful to the faculty and staff of the Wildlife Institute of India for providing their technical expertise, and logistical support, which ensured the seamless execution of this ambitious project.

The steady improvement in MEE scores across cycles is a testament to the effectiveness of our collective efforts and the resilience of our conservation strategies. As we move forward, it is imperative to leverage the findings of this evaluation to address gaps, refine our approaches, and further strengthen the management of our protected areas.

Virendra Rambahal Tiwari

# ACKNOWLEDGMENTS

I express my profound gratitude to numerous organizations and individuals whose contributions were key to the successful completion of the repeat cycle of Management Effectiveness Evaluation (MEE) of National Parks and Wildlife Sanctuaries during 2020-25. This ambitious undertaking, spanning multiple years and encompassing a vast geographical area, would not have been possible without the dedicated support and expertise of many.

First and foremost, I am deeply grateful to the Ministry of Environment, Forest and Climate Change (MoEF&CC) for their invaluable technical guidance and financial assistance, which made this extensive exercise possible. My heartfelt appreciation goes to Sh. Sushil Kumar Awasthi, Director General of Forest & Special Secretary MoEF&CC; Sh. Sunil Sharma, Joint Director-Wildlife, MoEF&CC; Sh. Soumitra Dasgupta, Former Additional Director General of Forest (Wildlife), MoEF&CC & Dr S.P. Yadav, Former Additional Director General of Forest (Wildlife), MoEF&CC for their leadership and steadfast support.

My sincere thanks go to the Chief Wildlife Wardens (CWLWs) of all the States and Union Territories, as well as the Field Directors and frontline staff of the evaluated 438 National Parks and Wildlife Sanctuaries, for their significant contributions to the Management Effectiveness Evaluation (MEE) exercise.

I also express my appreciation for the dedicated efforts and professional expertise of the independent evaluation teams (Chairpersons and members) constituted for this purpose, whose thorough assessments and insights have been instrumental in the evaluation process.

A special note of gratitude to the Directors of the Wildlife Institute of India since 2018, whose vision and leadership have guided this initiative: Dr. Vinod Bihari Mathur, Dr G.S. Rawat, Dr. Dhananjai Mohan, Dr S.P. Yadav & our present Director Shri Virendra R. Tiwari.

I am particularly indebted to all the Faculty Members of the Wildlife Institute of India for their steadfast support and active participation in accomplishing this important task. I also acknowledge the significant contributions made by the staff of the Wildlife Institute of India, whose administrative, and logistical support ensured the seamless functioning of the project.

I extend my heartfelt gratitude to Ms. Deepali Bansal, Former Office Assistant, Ms. Ananya Das, Project Associate II; and Ms. Anindita Debnath, Project Associate II, Ms. Haritha J. (for GIS support), Dr. Nasim Ahmad Ansari, Former Project Scientist, MEE, Dr. Avilekh, Project Scientist II, MEE; and Sh. V.K. Uniyal, Former PCCF, Kerala; for their commitment and significant contributions to this endeavour. The contributions of each of these individuals have been invaluable in ensuring the success of this evaluation.

**Gautam Talukdar**

# TABLE OF CONTENTS



Introduction	2
Process and Methodology	6
Highlights	13
Executive Summary	
1. Andhra Pradesh	18
2. Arunachal Pradesh	26
3. Assam	34
4. Bihar	44
5. Chhattisgarh	52
6. Goa	60
7. Gujarat	66
8. Haryana	78
9. Himachal Pradesh	84
10. Jharkhand	100
11. Karnataka	108
12. Kerala	124
13. Madhya Pradesh	134
14. Maharashtra	146
15. Manipur	164
16. Meghalaya	170
17. Mizoram	174
18. Nagaland	182
19. Odisha	186
20. Punjab	196
21. Rajasthan	204
22. Sikkim	214
23. Tamil Nadu	220
24. Telangana	234
25. Tripura	242
26. Uttar Pradesh	248
27. Uttarakhand	260
28. West Bengal	268
29. Chandigarh	278
30. Dadra & Nagar Haveli and Daman & Diu	282
31. Delhi	286
32. Jammu & Kashmir	290
33. Ladakh	300
34. Puducherry	304
Way Forward	306
References	307
Annexure I:	308

# ABBREVIATIONS LIST

S.No.	Abbreviations	Full forms	S.No.	Abbreviations	Full forms
1	ACF	Assistant Conservator of Forests	24	EDC	Eco-Development Committee
2	APC	Anti-Poaching Camp	25	ER	Elephant Reserve
3	APO	Annual Plan of Operations	26	ESZ	Eco-Sensitive Zone
4	ASI	Archaeological Survey of India	27	ETDC	Eco-Tourism Development Committee
5	BNHS	Bombay Natural History Society	28	FCA	Forest Conservation Act, 1980
6	BRT TR	Biligiri Rangaswamy Temple Tiger Reserve	29	FD	Forest Department
7	BSF	Border Security Force	30	FDA	Forest Development Agency
8	BSI	Botanical Survey of India	31	FRA	Forest Rights Act, 2006
9	CAF	Central Asian Flyway	32	GCA	Gir Conservation Area
10	CAMPA	Compensatory Afforestation Fund Management and Planning Authority	33	GHNP	Great Himalayan National Park
			34	GHNP-CA	Great Himalayan National Park Conservation Area
11	CCF	Chief Conservator of Forests	35	GIB	Great Indian Bustard
12	CMPA	Coastal and Marine Protected Area	36	GPS	Global Positioning System
13	CPT	Cattle Proof Trench	37	GSI	Geological Survey of India
14	CSR	Corporate Social Responsibility	38	HWC	Human-Wildlife Conflict
15	CSS	Centrally Sponsored Schemes	39	HWEA	Harike Wetland and Eco-tourism Authority
16	CWLW	Chief Wildlife Warden	40	IBA	Important Bird and Biodiversity Areas
17	CZA	Central Zoo Authority	41	IIFM	Indian Institute of Forest Management
18	DCF	Deputy Conservator of Forests	42	ITBP	Indo-Tibetan Border Police
19	DFO	Divisional Forest Officer	43	IUCN	International Union for Conservation of Nature
20	DGPS	Differential Global Positioning System	44	JFM	Joint Forest Management
21	DPR	Detailed Project Report	45	JFMC	Joint Forest Management Committee
22	DRDO	Defence Research and Development Organisation	46	JICA	Japan International Cooperation Agency
23	DRR	Disaster Risk Reduction	47	KAPY	Krushaka Aranya Protsaha Yojana

S.No.	Abbreviations	Full forms	S.No.	Abbreviations	Full forms
48	KFRI	Kerala Forest Research Institute	65	PWD	Public Works Department
49	KGNP	Kheer Ganga National Park	66	RCC	Reinforced Cement Concrete
50	MADA	Modified Area Development Agency	67	REC	Regional Expert Committee
51	MEE	Management Effectiveness Evaluation	68	RET	Rare, Endangered, and Threatened
52	MM Hills TR	Malai Mahadeshwara Hills Tiger Reserve	69	RF	Reserved Forest
53	MoEFCC	Ministry of Environment, Forest and Climate Change	70	RO	Range Officer
54	MoU	Memorandum of Understanding	71	SHG	Self Help Group
55	M-STrIPES	Monitoring System for Tigers - Intensive Protection and Ecological Status	72	SMC	Soil Moisture Content
56	NCBS	National Centre for Biological Sciences	73	SOP	Standard Operating Procedure
57	NCF	Nature Conservation Foundation	74	SWA	State Wetland Authority
58	NGO	Non-Governmental Organisation	75	SWAP	Strengths, Weaknesses and Actionable Points
59	NMHS-NLC	National Mission on Himalayan Studies – Nature Learning Centre	76	TR	Tiger Reserve
60	NP	National Park	77	UNESCO	United Nations Educational, Scientific and Cultural Organization
61	NTCA	National Tiger Conservation Authority	78	VC	Village Council
62	NTFP	Non-Timber Forest Product	79	VFC	Village Forest Committee
63	PA	Protected Area	80	WCPA	World Commission on Protected Areas
64	PCCF-HoFF	Principal Chief Conservator of Forests - Head of Forest Force	81	WII	Wildlife Institute of India
			82	WLPA	Wildlife Protection Act, 1972
			83	WLS	Wildlife Sanctuary
			84	WTI	Wildlife Trust of India
			85	ZSI	Zoological Survey of India



# *Introduction*

*Spotted Forktail © Vivek Sarkar*

# INTRODUCTION

Protected Areas (PAs) are crucial components of global conservation efforts, essential for preserving biodiversity and maintaining ecological balance. By protecting ecosystems and the diverse species within them, PAs contribute significantly to human well-being, offering services such as food security, clean water supply, medicinal resources, and climate change mitigation. Furthermore, they enhance community resilience against natural disasters and play a vital role in preserving the cultural heritage and livelihoods of local populations, thus highlighting their multifaceted importance (Hockings, 2003; United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC) and IUCN, 2021). They support international environmental agreements aimed at safeguarding the planet's natural resources (Stoll-

Kleemann, 2010; Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES, 2019).

In addition to their ecological and social value, PAs serve as critical habitats for numerous species, particularly large, charismatic animals like tigers and elephants, which depend on these safeguarded landscapes for their survival. As stakeholders increasingly recognize the value of PAs in achieving sustainable development goals and combating climate change, the management of these areas has come under scrutiny. When effectively managed, networks of PAs can enhance resilience to environmental changes and foster ecological connections that facilitate species adaptation.



However, despite their indispensable role, PAs are confronted with various challenges that can undermine their effectiveness. Development pressures, human encroachment, mining, quarrying, and uncontrolled tourism threaten the integrity of these essential areas (Mathur et al., 2019). These threats underscore the need for a landscape-focused approach to PA management, emphasizing the integration of biodiversity considerations across all societal sectors and the importance of connecting different PAs.

In both advanced and developing nations, it is increasingly evident that merely declaring PAs is insufficient for ensuring effective biodiversity protection. Many PAs face obstacles that hinder their ability to achieve conservation goals, prompting growing concerns among professionals and the public that these areas may not fulfill their intended purposes. Indeed, some PAs risk losing the very values for which they were established. As a result, enhancing the management effectiveness of PAs has emerged as a critical focus within the conservation community.

MEE represents a systematic approach to assessing how well PAs are managed and their effectiveness in conserving targeted flora and fauna. MEE is a vital component of systematic conservation planning (Margules and Pressey, 2000) and provides policymakers with essential information to bridge the gap between conservation objectives and real-world outcomes (Jepson et al., 2002). Through MEE, stakeholders gain insights into operational strengths and weaknesses, allowing them to identify specific areas requiring enhancement. This data-driven approach facilitates the development of targeted management strategies designed to improve the capacity of PAs to conserve biodiversity effectively and tackle the myriad challenges they face.

Moreover, implementing MEE can foster greater accountability and transparency within PA management, empowering local communities and stakeholders to engage more actively in conservation efforts. By involving diverse perspectives and knowledge systems in the evaluation process, MEE can yield comprehensive insights that support transparency, adaptive management and informed decision-making, ensuring PAs remain resilient and effective in preserving our planet's invaluable biodiversity for future generations. In this way, MEE not only reinforces the importance of PAs but also contributes to a broader narrative about the need for robust, inclusive, and proactive conservation strategies in the face of ongoing environmental challenges.

Scores of Management Effectiveness Evaluation (MEE) should not be compared across PAs as they are context-specific and influenced by various factors such as PA size, habitat type, management objectives, and socio-political context. Comparing MEE scores across PAs can be misleading and unfair, as it fails to account for these differences. Instead, MEE scores are useful for determining trends over time within a specific PA, allowing managers to track progress, identify areas for improvement, and adjust management strategies accordingly. Additionally, MEE scores can help identify strengths and weaknesses within a PA, facilitate communication among stakeholders, and inform resource allocation decisions. By focusing on trends over time within a PA, rather than comparisons across PAs, MEE scores can support continuous learning, nuanced, accountability and meaningful understanding of management effectiveness and outcomes.



# Process and Methodology



Orange Breasted Leafbird (Female) © Vivek Sarkar

# PROCESS AND METHODOLOGY

The methodology for assessing the effectiveness of PAs on several factors, such as time, resources, availability and quality of information, and the level of stakeholder participation. Given the diverse situations and needs of different PAs, tailored assessment methods are essential. Consequently, a range of assessment tools has been developed to guide and document changes in management practices. Over the years, numerous assessment systems have emerged, most of which are based, at least in part, on the World Commission on PAs (WCPA) Framework. These systems range from simple questionnaire-based approaches suitable for individual PAs to workshop-style methods aimed at evaluating entire PA networks, as well as detailed monitoring systems. One such approach is a comprehensive monitoring and evaluation system

designed for sites of particular importance (Hockings et al., 2008).

## Assessment Process for MEE of National Parks (NP) & Wildlife Sanctuaries (WLS):

In India, MEE process has been tailored and institutionalized based on the IUCN-WCPA evaluation framework. This detailed monitoring system is grounded in six key elements of the WCPA Framework: Context, Planning, Input, Process, Output, and Outcomes. The evaluation incorporates "Headline Indicators" that have been customized to reflect the Indian context. Each Headline Indicator is assessed using four possible responses: "poor," "fair," "good," and "very good," enabling a consistent evaluation of PAs across the country.

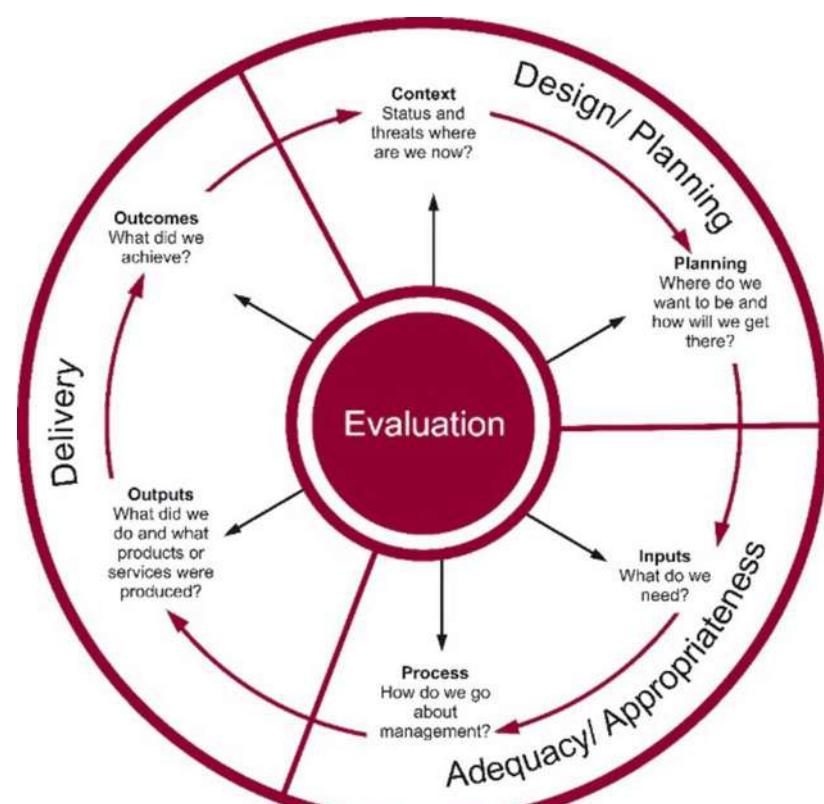


Figure 1: IUCN WCPA MEE Framework

For assessment of each of the six elements of the MEE Framework, 32 criteria (Table- 1) have been developed for MEE of NP and WLS in India. Explanatory notes on 'Criteria', wherever needed, were provided to guide the assessment process. A detailed matrix was developed and included as a part of assessment to make the scoring more objective after assigning differential weightages to different criteria/indicators. Against each 'Criteria' the evaluation team indicated appropriate 'Reference document(s)' and also provided 'Remarks'. The scores, evidence supported by observations/ remarks that qualify such scores provide the complete picture.

The scoring is done based on the parameters indicated in the matrix for each headline indicator. The evaluators

are only allowed to choose one response and each response is assigned a score from 2.5 to 10, a score of 2.5 represents the lowest management effectiveness and is rated as 'poor'; a score of 5 represents average management effectiveness and is rated as 'fair'; a score of 7.5 represents the below optimal management effectiveness and is rated as 'good', whereas a score of 10 represents the optimal management effectiveness and is rated as 'very good'. The scores of all 32 'criteria/indicators' are pooled together and a percentage rating is calculated for each PA. This interpretation classifies the results into four categories based on the percentage of maximum possible score: Poor – upto 40.99%; Fair - 41 to 59.99%; Good - 60 to 74.99%; Very Good – 75% and above.



Red Panda © Pooja Kumari

**Table 1:** List of 32 criteria/indicators adopted for repeat cycle of MEE of NP & WLS

Element	Indicator
<b>Context</b>	1.1 Are the values of the site well documented, assessed and monitored? 1.2 Are the threats to site values well documented and assessed? 1.3 Is the site free from human and biotic interference?
<b>Planning</b>	2.1 Is the site properly identified (NP/WLS) and categorized (in terms of zonation) to achieve the objectives? 2.2 Does the site have a comprehensive management plan? 2.3 Is the management plan routinely and systematically updated? 2.4 Does the management plan elaborate on safeguarding the threatened biodiversity values? 2.5 Are stakeholders given an opportunity to participate in planning? 2.6 Are habitat restoration programmes systematically planned and monitored? 2.7 Does the site have an effective protection strategy? 2.8 Does the management plan integrate the site into a wider ecological network/ landscape following the principles of the ecosystem approach? 2.9 Is there a mechanism to manage the PA to adapt to climate change and Disaster Risk Reduction (DRR) to increase its resilience?
<b>Input</b>	3.1 Are personnel adequate, well organized and deployed with access to adequate resources in the site? 3.2 Does the site have trained manpower resources for effective PA management? 3.3 Are resources (vehicle, equipment, building, technology etc.) adequate, well organized and managed with access to adequate resources? 3.4 Are resources (human and financial) linked to priority actions and are funds released timely? 3.5 What level of support is provided by other institutions? 3.6 Does PA manager considers resources (human and financial) to be sufficient?
<b>Process</b>	4.1 Is PA staff performance management linked to achievement of management objectives? 4.2 Is there effective public participation in PA management? 4.3 Is there a responsive system for handling complaints and comments about PA management? 4.4 Does PA management address the livelihood issues of resource dependent communities especially women? 4.5 Does the site have a mechanism for cross-sectoral/ inter-sectoral linkages for effective management of PA?
<b>Output</b>	5.1 Is adequate information on PA management publicly available? 5.2 Are visitor services (tourism and interpretation) and facilities appropriate for the relevant PA category? 5.3 Are research/ monitoring related trends systematically evaluated and routinely reported and used to improve management? 5.4 Is there a systematic maintenance schedule and funds in place for management of infrastructure/assets?
<b>Outcome</b>	6.1 Are populations of threatened species especially key faunal species declining, stable or increasing? 6.2 Have the threats to the site being reduced/ minimized or is there an increase? 6.3 Has the site been effective in the mitigation of human-wildlife conflicts (HWCs)? 6.4 Are the expectations of visitors generally met or exceeded? 6.5 Are local communities supportive of PA management?

### **Regional Expert Committees (REC):**

As MEE is an independent process and in order to ensure credibility of MEE Exercise, separate MEE Teams/independent Regional Expert Committees (REC) are constituted for each cycle of evaluation of NP and WLS. Each team comprises of a Chairman and 2 Members having experience of more than 10-20 years especially in the field of PA management, who may be a scientist/university professor/NGO representative. Each team is assisted by a WII faculty member for facilitating the MEE exercise.

### **Flow of Assessment Process:**

The evaluation process begins with the constitution of Regional Expert Committees. Following the inception workshop, teams visit their assigned PAs. Teams conducted MEE as per the prescribed assessment criteria and completed the MEE score card after cross checking the supportive documents provided by the PA manager. Efforts are made to ensure that the four-member independent expert MEE teams visit the PAs together and spend atleast two days per site. At the end of the site visit, a meeting is organized with PA managers and his/her representatives to discuss the findings of the evaluation and to seek additional information/ clarifications. The PA manager may also make a written submission to the team. The Chairperson of the respective committees compile and submit the reports to WII after completion of field visit of assigned PA. In addition to the site reports, the Chairperson also has to submit a report on each PA visited that has the introduction of the PA, management strength, management weakness, immediate actionable points and review of previous actionable points from Strength, Weakness, Actionable Points (SWAP) report.

### **Timeline and Activities of Repeat Cycle:**

A total of 452 PAs were taken up for the repeat cycle of evaluation (Annexure I), out of which 413 PAs were evaluated in three phases from 2020 to 2022 (Phase I), 2022 to 2023 (Phase II) & 2023 to 2025 Phase III (Table 2). Twenty-five PAs, initially assessed during the first evaluation cycle (2018-2019) as part of pilot study, were included again to maintain consistency for the repeat cycle (Table 3). Additionally, 14 PAs from the allocated list were omitted from the evaluation process (Table 4). In Phase I (2020-22), twenty independent RECs evaluated 210 NPs and WLSs. Despite deferring 49 PAs due to COVID-19 and omitting five PAs, 156 PAs were successfully evaluated. Phase II (2022-23) involved the assessment of 150 PAs, comprising 101

newly selected PAs and 49 deferred from the first phase. Reconstituted REC teams conducted evaluations with guidance from an updated technical manual (2022 Edition), concluding field visits by February 2023. Management plans and key documents were digitized into a centralized database, and three PAs were omitted from the process (Table 4). Phase III (2023-25) began with an inception workshop in September 2023, where reconstituted REC teams utilized the 2023 edition of the technical manual for evaluations. Field visits concluded in October 2024, followed by the submission of MEE assessment forms and SWAP reports. Six PAs were omitted (Table 4), and on October 4, 2024, WII organized a hybrid interaction meeting with all CWLWs to share executive summaries and SWAP reports for finalizing the MEE report. These reports were also shared with CWLWs for vetting and review via email, with copies sent to the respective evaluation teams.



Orange-headed Ground Thrush © Vivek Sarkar

**Table 2:** Numbers of PAs Allocated and Evaluated for Repeat Cycle

Sl	Cycle/Phase	Year	Number of PAs Allocated	Number of PAs Evaluated	Remarks
1	Repeat Cycle (Pilot)	2018-2019	25	25	Total 146 PAs were taken up for evaluation out of which 25 PAs evaluated for 2 <sup>nd</sup> time on pilot basis to prepare for repeat cycle
2	Repeat Cycle (Phase I)	2020-2022	210	156	49 PAs were deferred from evaluation in Phase I due to COVID related issues. These PAs were taken up during the Phase II of evaluation of repeat cycle. Additionally, 05 PAs were omitted for evaluation and the reason are discussed in Table 4.
3	Repeat Cycle Phase (II)	2022-2023	150 (included 49 PAs deferred from Phase I)	147	Three PAs were omitted for evaluation and the reason are discussed in Table 4
4	Repeat Cycle (Phase III)	2023-2025	116	110	Six PAs were omitted for evaluation and the reason are discussed in Table 4
<b>Total PAs</b>		<b>501</b>	<b>438</b>		



**Table 3:** List of repeated 25 NP&WLS evaluated in pilot study of first cycle of evaluation (2018-2019)

Sl	Team	State	NP&WLS
1.	Dr. S.K. Khanduri, Dr. E.A Jayson, Dr. Arun Mani Dixit, Shri Vinod D.K.	Andhra Pradesh	Papikonda NP
2.	Dr. Pradeep Vyas, Dr. Umesh Kumar Tiwari,	Arunachal Pradesh	Sessa Orchid WLS
3.	Dr. Bibhuti Lahkar, Dr. Bivash Pandav	Assam	Pobitora WLS
4.	Shri Rajiv Kumar Srivastava, Dr. Ashish David, Dr. Nita Shah, Dr. Gautam Talukdar	Gujarat	Barda WLS
5.	Shri B.S. Bonal, Dr. Khurshid Ahmad,	Himachal Pradesh	Great Himalayan NP
6.	Dr. Justus Joshua, Dr. S. Sathyakumar	Haryana	Sultanpur NP
7.	Dr. V.K. Melkani, Dr. Vibhu Prakash, Dr. Jeet Ram, Dr. K. Sivakumar	Jammu & Kashmir	Kishtwar High Altitude NP
8.	Dr. A.K. Bhardwaj, Dr. Ram Kumar, Dr. Udayan Borthakur, Dr. B.S. Adhikari	Jharkhand	Mahuadanr Wolf WLS
9.		Odisha	Sunabeda WLS
10.			Bhitarkanika NP & WLS
11.	Shri P. Anur Reddy, Dr. S. Narendra Prasad, Shri B.C. Choudhury, Dr. Abhijit Das	Kerala	Wayanad WLS
12.	Dr. Alok Saxena, Dr. Jayant Kulkarni,	Madhya Pradesh	Kuno WLS
13.	Shri Ajay Desai, Dr. Suresh Kumar		Madhav NP
14.	Shri U.M. Sahai, Dr. Advait Edgaonkar, Ms. Seema Bhatt, Dr. S.P. Goyal	Maharashtra	Sanjay Gandhi (Borivilli) NP
15.	Shri T.T.C. Marak, Dr. B.K. Mishra,	Meghalaya	Nongkhylliem WLS
16.	Dr. Yogesh Dubey, Shri Salvador Lyngdoh	Manipur	Keibul Lamjao NP
17.		Sikkim	Khangchendzonga NP
18.		Tripura	Sepahijala WLS & Clouded Leopard NP
19.	Shri V. Gopinath, Shri Roy P. Thomas, Dr. Manisha Thapliyal, Dr. Manoj Nair	Rajasthan	Keoladeo NP
20.	Shri B.K. Singh, Dr. Lalit Kumar Sharma, Dr. P.S. Easa, Dr. Asha Rajvanshi	Tamil Nadu	Gulf of Mannar Marine NP
21.	Dr. Anmol Kumar, Dr. Dipankar Ghose,	Uttar Pradesh	National Chambal WLS
22.	Dr. Rathin Barman, Shri Ajay Srivastav		Sohelwa WLS
23.		Uttarakhand	Govind Pashu Vihar WLS
24.	Shri Azam Zaidi, Shri P. Krishna Mohan,	West Bengal	Mahananda WLS
25.	Dr. Diwakar Sharma, Dr. Bilal Habib		Jaldapara WLS

\* Chairman, Team Members and WII Faculty



**Table 4:** List of 14 PAs which were omitted in repeat cycle

Sl.	State	Name of PA	Reason of exclusion / omission as recommended by MEE Chairpersons
<b>Phase I (2020-2022)</b>			
1.	Madhya Pradesh	Karera WLS	This PA is in advanced stage of denotification.
2.	Maharashtra	Chandoli NP	This PA is part of Sahyadri Tiger Reserve (TR)
3.	Maharashtra	Koka WLS	This PA is part of Navegaon- Nagzira TR
4.	Nagaland	Puliebadze WLS	This PA has been notified under State Jhumland Act (not under Wildlife Protection Act, 1972).
5.	West Bengal	Ramnabagan WLS	This PA has been managed as Zoo, is to be evaluated separately by Central Zoo Authority (CZA).
<b>Phase II (2022-2023)</b>			
6.	Jammu & Kashmir	Hokersar WLS	This PA has been declared a conservation reserve
7.	Manipur	Thinungei WLS	Boundary is not demarcated
8.	Mizoram	Buvhum WLS	Notification has not been issued
<b>Phase III (2023-2025)</b>			
9.	Himachal Pradesh	Inderkilla NP	This PA has made no progress in securing the notified area within PA network till date and the area is still with Kullu territorial forest division.
10.	Himachal Pradesh	Khrganga NP	This PA has not been handed over to wildlife wing from Parbati Territorial division
11.	Uttar Pradesh	Dr. Bhimrao Ambedkar Bird WLS	The department has not taken possession of this sanctuary and the FD is not managing this sanctuary
12.	Chhattisgarh	Pamed Buffalo WLS	This PA is under the most affected left wing extremism districts
13.	West Bengal	Jorepokhri Salamander WLS	Notification of the sanctuary is still awaited
14.	Maharastra	Isapur WLS	Not under unified control of the Forest Division.

# HIGHLIGHTS

The repeat cycle of MEE assessed 438 PAs across different states and union territories, with an overall mean MEE score of 64.41%, indicating management effectiveness as "Good." Among these, 84 PAs were rated as "Very Good," highlighting their strong management practices, adherence to conservation goals, and effective implementation of MEE recommendations.

At the state / UT level, Chandigarh (85.16%) and Kerala (76.22%) emerged as the top performers with "Very Good" ratings, while Karnataka, Punjab, and Himachal Pradesh followed closely with high "Good" ratings. On the other end of the spectrum, Ladakh (34.9%) was the only region categorized as "Poor," reflecting significant challenges in PA management (Table 5).

**Table 5:** State wise MEE Scores for the evaluated NP & WLs

SI	State	Numbers of PAs Evaluated	Mean MEE Score (%)	Minimum MEE Score (%)	Maximum MEE Score (%)	Rating
1.	Andhra Pradesh	10	62.76	51.56	78.13	Good
2.	Arunachal Pradesh	12	54.57	26.56	80.47	Fair
3.	Assam	17	53.50	35.94	74.16	Fair
4.	Bihar	11	58.74	44.53	72.66	Fair
5.	Chandigarh	2	85.16	83.59	86.72	Very Good
6.	Chhattisgarh	9	62.24	53.91	76.56	Good
7.	Dadra & Nagar Haveli and Daman & Diu	2	57.81	57.81	57.81	Fair
8.	Delhi	1	65.63	65.63	65.63	Good
9.	Goa	7	65.07	57.03	78.13	Good
10.	Gujarat	25	67.59	49.22	81.25	Good
11.	Haryana	8	59.39	50.00	75.00	Fair
12.	Himachal Pradesh	31	71.36	53.91	92.19	Good
13.	Jammu & Kashmir	16	64.43	50.00	92.97	Good
14.	Jharkhand	10	56.24	45.31	62.50	Fair
15.	Karnataka	31	74.24	42.19	90.63	Good
16.	Kerala	21	76.22	54.31	92.97	Very Good
17.	Ladakh	3	34.90	30.47	37.50	Poor
18.	Madhya Pradesh	22	63.97	43.75	88.33	Good
19.	Maharashtra	34	65.24	38.28	89.84	Good
20.	Manipur	8	47.32	32.81	73.33	Fair

SI	State	Numbers of PAs Evaluated	Mean MEE Score (%)	Minimum MEE Score (%)	Maximum MEE Score (%)	Rating
21.	Meghalaya	6	65.87	54.69	79.17	Good
22.	Mizoram	9	55.99	46.88	72.66	Fair
23.	Nagaland	3	64.03	48.33	74.22	Good
24.	Odisha	15	66.91	60.16	75.86	Good
25.	Puducherry	1	66.41	66.41	66.41	Good
26.	Punjab	13	71.74	55.00	83.59	Good
27.	Rajasthan	18	58.52	39.52	73.44	Fair
28.	Sikkim	8	64.23	57.81	77.50	Good
29.	Tamil Nadu	26	65.34	48.39	83.59	Good
30.	Telangana	10	67.88	52.34	76.56	Good
31.	Tripura	6	69.94	58.06	76.56	Good
32.	Uttar Pradesh	21	55.35	29.69	78.91	Fair
33.	Uttarakhand	9	56.47	35.16	65.63	Fair
34.	West Bengal	13	69.06	29.69	82.03	Good
<b>Total</b>		<b>438</b>	<b>64.41</b> (Mean MEE Score )			<b>Good</b>

Rating (% MEE Score) - Poor – upto 40.99%; Fair - 41 to 59.99%; Good - 60 to 74.99%; Very Good – 75% and above.

Among the highest-scoring individual PAs, Eravikulam NP in Kerala and Dachigam NP in Jammu & Kashmir recorded the highest MEE scores of 92.97%. Other well-managed sites included Bandli WLS (92.19%), Mathikettan Shola NP (90.63%), and Daroji Bear WLS (90.63%), all demonstrating exceptional conservation effectiveness (Table 6). On

the other hand, several PAs struggled with low scores, for example Ringba-Roba WLS in Arunachal Pradesh, Jai Prakash Narayan Bird WLS in Uttar Pradesh and Pakhi Bitan Bird WLS in West Bengal & Hemis NP in Ladakh. Further details are provided in the respective state/UT chapters.

**Table 6:** Top scoring PAs

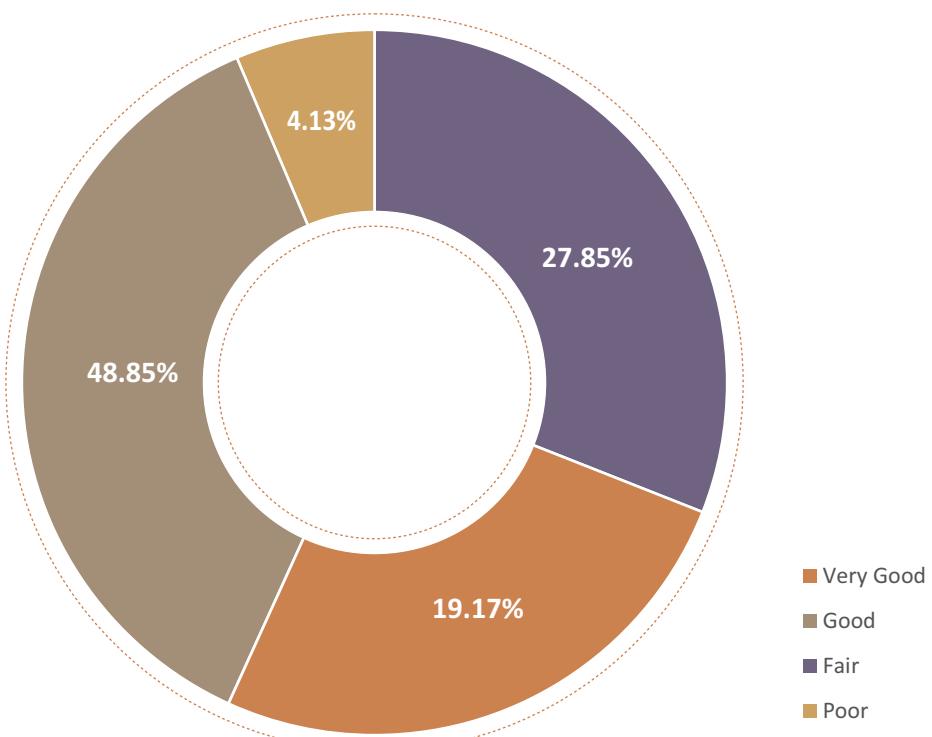
SI No.	State/UTs	Name of NP/WLS	MEE Score %
1.	Jammu & Kashmir	Dachigam NP	92.97
2.	Kerala	Eravikulam NP	92.97
3.	Himachal Pradesh	Bandli WLS	92.19
4.	Karnataka	Daroji Bear WLS	90.63
5.	Kerala	Mathikettan Shola NP	90.63
6.	Kerala	Chinnar WLS	89.84
7.	Maharashtra	Umred- Karhandla WLS	89.84
8.	Karnataka	Cauvery WLS	89.06
9.	Madhya Pradesh	Van Vihar NP	88.33
10.	Maharashtra	Lonar WLS	88.28



*Chinkara at Gandhisagar WLS © Moulik Sarkar*

In terms of overall distribution, 84 PAs achieved a "Very Good" rating, while the majority, 214 PAs, fell into the "Good" category. A substantial number, 122 PAs, were rated as "Fair," showing room for

improvement, while 18 PAs were categorized as "Poor," signifying the need for enhanced management efforts (Figure 2) .



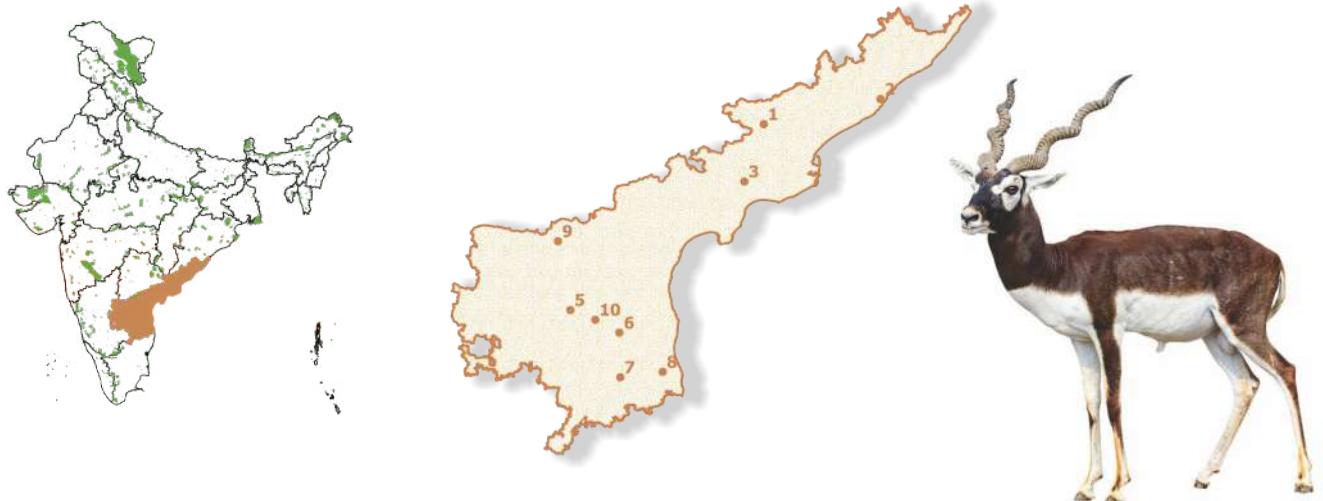
*Figure 2: Percentage of PAs under different rankings*



# Andhra Pradesh



Leopard © Vivek Sarkar



## Andhra Pradesh

Andhra Pradesh, located in southern India, spans a geographical area of approximately 162,923 Km<sup>2</sup>. The state's forest cover is 30,084.96 Km<sup>2</sup>, accounting for 18.46% of its geographic area (India State of Forest Report (ISFR) 2023). In the first cycle of MEE, a total of 14 PAs were assessed. In the repeat cycle, 10 PAs were evaluated, while four were excluded—three due to their classification as Coastal and Marine PAs (CMPAs) and one as it falls within a TR, which was assessed separately under the MEE process.

### 1. Papikonda NP, Andhra Pradesh (2018-19):

Papikonda NP, covering an area of 1,012.86 Km<sup>2</sup> was established in 2008. The PA serves as a part of a large landscape and protected catchment of the Indira Sagar reservoir, upstream of the Polavaram irrigation project on the river Godavari. EDC-driven livelihood activities, including eco-tourism engages the Konda Reddy tribe gainfully in PA management. The upstream part of the Indira Sagar reservoir is within the PA and has high potential for environmental education and awareness. The PA is administered under four different divisions. The process of village relocation from the NP is slow. Of the 47 villages in the NP, 26 are being rehabilitated out of the PA due to submergence, and only 3 have been fully resettled. A public road running along the northern boundary separates this park from the rest of the landscape to the north. Poor road network, inadequate communication facilities, and inadequate monitoring on various physiographic, hydrological and biodiversity values of the PA weaken the management further.

**Recommendations-** The recommendations include establishment of a unified command under the DFO Wildlife for effective administration and management of the NP; revisiting and updating the management

plan in view of the alteration in the habitats due to ongoing Polavaram irrigation project; notifying the areas acquired and their rights settled as NP at the earliest; setting up of road and communication network; documenting and monitoring the ecological and conservation values of the park; expanding the engagement of EDCs beyond ecotourism, especially in the area of nature education and awareness.

### 2. Kambalakonda WLS, Andhra Pradesh (2022-23):

Kambalakonda WLS, located in Andhra Pradesh, spans an area of 71.39 Km<sup>2</sup> and was notified in 2002. It is situated in the Eastern Ghats on the outskirts of Visakhapatnam city, characterized by gentle to steep slopes and valleys. This PA serves as a vital green lung for the expanding city of Visakhapatnam, holding significant ecological relevance. A management plan is currently in place, and an Eco-Sensitive Zone (ESZ) was notified in 2017. Several local Non-Governmental Organisations (NGOs) collaborate with the management of the PA on research and outreach activities. The sanctuary has a well-defined patrolling strategy accompanied by adequate protection infrastructure. Camera traps have been deployed, and the data is being monitored. Support from Corporate

Social Responsibility (CSR) funding has also been received. Although previous suggestions from MEE have been partially complied with, there remain challenges. The PA is enclaved within the greater Visakhapatnam city, with one village situated inside its boundary, resulting in biotic disturbances. It is not connected to another similar landscape and is prone to HWC.

**Recommendations** –The Recommendations include relocating the enclaved village out of the PA, undertaking habitat improvement works—especially Soil and Moisture Conservation (SMC) and invasive species removal—requesting the Greater Visakhapatnam Municipal Authority to adopt a landscape approach for city planning, which would allow connectivity between various valleys to facilitate the free movement of wild animals. Additionally, conducting a comprehensive floral and faunal assessment is essential, and it is suggested to explore the soft release of a captive-bred population of wild dogs from Indira Gandhi Zoo into the PA.

### 3. Kolleru WLS, Andhra Pradesh (2022-23):

Kolleru Lake, recognized as the largest freshwater wetland in India, encompasses an area of 308.552 Km<sup>2</sup> below the five-foot contour and was notified as a PA in 1999. As a Ramsar site, it is a natural lake located between the Godavari and Krishna deltas, hosting 50% of India's Grey Pelican population. The boundary of the PA has been consolidated based on the judgment of the Supreme Court in 2006, with the contour level maintained at five feet. Numerous studies have been conducted on Kolleru Lake, particularly focusing on water quality and various threats to the ecosystem. Regular bird censuses are conducted, and there are well-constructed raised platforms for perching and nesting, which benefit the Grey Pelicans. The sanctuary has achieved good control over illegal fishing and aquaculture, although previous recommendations from MEE have only been partially fulfilled.

The management plan for the PA has not been approved, and the land belongs to the irrigation department. Most of the 65 channels that supply water to the PA are currently silted. Local villagers, whose lands were acquired and fishermen, whose rights were revoked without compensation, express hostility towards the management of the PA. There is immense pressure to reduce the contour level from the existing five feet to three feet. Additionally, there is inadequate participation from Eco-Development Committees (EDCs), as well as administrative shortcomings at the supervisory level, a shortage of frontline staff, insufficient training, and worsening water quality due to the inflow of wastewater and chemicals, all

contributing to the existing problems.

**Recommendations** –The Recommendations to improve the situation include approving the management plan, addressing the grievances of villagers and fishermen through a consultative process, appointing an independent Divisional Forest Officer (DFO), and filling existing staff vacancies. There is also a call to prepare an eco-tourism plan to develop the area as a bird tourism hub in the country, as well as to enable EDCs and local youth to become bird guides. Additionally, improving publicity, interpretation, and outreach activities is essential, along with developing a nature tourism circuit that includes Coringa WLS. It is also recommended to expose selected staff to global bird conservation events and actively engage with scientific organizations and NGOs focused on bird conservation

### 4. Koundinya WLS, Andhra Pradesh (2022-23):

Administered under the Chittoor Forest Division, the PA spans 357.60 km<sup>2</sup> and shares common borders with the Reserved Forests (RFs) of Tamil Nadu and Karnataka. It was notified in 1998. Historically, this area served as a range for elephants and is now part of the Rayala Elephant Reserve (ER), which was notified in 2003. Elephants re-appeared in the region in 1984, migrating from Karnataka and Tamil Nadu. Out of approximately 65 elephants in Andhra Pradesh, about half reside within this PA. The region boasts significant biodiversity and hydrological values, and effective human-elephant conflict mitigation measures, including electric fencing, trenches, and Reinforced Cement Concrete (RCC) barriers, have been implemented. While previous recommendations from MEE have been partially complied with, there are ongoing challenges.

The management plan for the PA has expired as of 2022, and 35% of posts remain unfilled, leaving protection camps inadequately staffed. Additional issues include vulnerability to poaching due to a porous border and the elongated shape of the PA, inadequate communication infrastructure, funding constraints, poor publicity, non-functional eco-tourism facilities, and insufficient participation from local communities.

**Recommendations** – The Recommendations to improve the situation include filling the vacancies for frontline staff, ensuring the timely release of funds, activating EDCs and Van Samrakshana Samitis (VSSs), and making the Naniyala eco-tourism facilities fully functional with appropriate revenue-sharing arrangements for the participating community.



Additionally, it is critical to establish a proper wildlife monitoring system, maintain the elephant-proof electric fence effectively, and involve local institutions and NGOs for outreach, capacity building, and monitoring programs.

### **5. Rajiv Gandhi (Rameswaram) NP, Andhra Pradesh (2022-23):**

Spread over 239.52 ha. and notified in 2005, the NP is located within the city limits of Proddatur town, under Proddatur range. Located close to the left bank of river Pennar, the PA is protected by a wall and fencing, and serves as a green lung for the town. A popular place for morning walkers and day visitors, the PA has a 2.3 km long trail, which is managed as an eco-tourism project, involving Naganuripalli VSS. It is connected with Rameswaram RF, and has a core zone of about 200 ha. ESZ and management plan is in place. Previous MEE recommendations are partially complied with. The PA is separated from Rameshwaram RF by a highway, and being completely fenced, it prevents animal migration.

It is managed by the range staff. The PA suffers from absence of scientific studies and baseline information on its biodiversity, and proper labelling of plants.

**Recommendations-** To enhance conservation awareness, develop an interpretation center with relevant displays and informative materials showcasing local ecology and wildlife. Utilize entry tickets creatively to disseminate educational content about the PA. Involve VSSs in management efforts to foster local stewardship and support. Additionally, engage local educational institutions to provide conservation education through field trips, workshops, and internship opportunities for students. These strategies will improve outreach and promote a culture of conservation among communities and visitors.

### **6. Sri Penusila Narasimha WLS, Andhra Pradesh (2022-23):**

The PA spans 1030.8 km<sup>2</sup>, covering four territorial divisions, and was notified in 1997, with ESZ



Leopard © Vivek Sarkar

designated in 2020. It supports many endemic and endangered species, and tigers have been reported in adjacent forests, making it a crucial component of a larger tiger landscape. The area is also home to Red Sanders, which are prioritized for high protection. A special task force, consisting of police and forest personnel, has been established to manage the area. There are currently five VSSs actively participating in conservation efforts, while the reservoir of Penna dam provides a vital water source for wildlife.

However, the PA faces several challenges. The staff strength is inadequate, and protection camps lack basic amenities. The smuggling of Red Sanders poses a significant threat, and the absence of single management complicates oversight. The road network is poorly maintained, staff lack wildlife orientation, and there is a lack of scientific information on wildlife, further exacerbating management struggles. Current management has predominantly focused on Red Sanders protection, with no evidence of ungulates or carnivores observed in the area. Additionally, the

existing Biodiversity Management Plan does not adhere to Wildlife Institute of India (WII) guidelines.

**Recommendations-** The recommendations to improve the situation include placing the PA under single management, increasing staff numbers and their capacities, and enhancing basic amenities. A robust survey of wild animals should be conducted, and a monitoring system established. Furthermore, involving more VSSs in the protection and management of the area is essential, along with maintaining the existing road network and removing illegal settlements of fishermen. Improving the waterway mobility of staff will also be important, as well as developing the PA as a key component of the Nagarjun Sagar-Kawal tiger complex.

## 7. Sri Venkateswara NP, Andhra Pradesh (2022-23):

The NP, 353.63 Km<sup>2</sup> in area was notified in 1998. It is a part of Seshachalam Biosphere Reserve, which was established in 2020. The PA includes the entire, 3000 ha. area of the famous Tirupati Tirumala Devasthanam, which holds the famous temple of Lord Sri Venkateswara. It is administered under two ranges of Rajampet Forest Division. It has well documented floral and faunal diversity, it supports some rare and endemic plants, like *Shorea taura*, *S. tambuggia*, *Terminalia pallida* and Red Sanders. The Red Sanders Task Force consists of police and forest personnel. ESZ is notified.

The smuggling of Red Sanders and the accidental deaths of wildlife along Tirumala Road present significant management challenges. Currently, there is approximately a 35% vacancy rate among frontline staff, coupled with protection camps that are not adequately manned. Budgetary constraints further exacerbate these issues, especially with delays in the release of Compensatory Afforestation Fund Management and Planning Authority (CAMPA) funds. Additionally, there is a lack of research and biodiversity monitoring, which hinders effective management and conservation efforts.

**Recommendations-** To tackle these challenges, ensure the timely release of funds and engage with relevant authorities to restrict vehicle speeds on Tirumala, preventing animal deaths. Collaborate with NGOs, scientific institutions, and experts to raise conservation awareness among temple staff, local communities, students, and pilgrims. Display conservation messages throughout the temple complex and trekking paths, and discourage the use of plastic and irresponsible garbage disposal among pilgrims to promote environmental responsibility



Heart-spotted Woodpecker © Rajdeep Mitra

## 8. Nellapattu WLS, Andhra Pradesh (2023-24):

Reported to be the largest pelicanry in Southeast Asia, the 458.92 ha area is integral to the Pulicat Lake ecosystem. It was notified in 1997. The PA consists of Kallur RF and Nellapattu Tank Block RF. The former provides the wetland's catchment area, while the Tank includes a large water body vital for bird life and downstream irrigation. Approximately 15,000 birds, including 1700 Grey Pelicans, and several Openbill Storks, Spoonbills, Night Herons, White Ibises, Egrets, Terns and ducks and waders use the PA as breeding and roosting habitats. The PA is well-protected by a combination of walls and chain-link fencing along the bund. The bund also serves as a trekking path from which tourists can view the birds. Local people and administration are quite supportive of the management, reflected in the conduct of a collaborative annual Flamingo festival.

The PA suffers from periodic droughts and fluctuating water levels, which poses challenges to maintaining a stable habitat for the birds. The sanctuary lacks adequate scientific research facilities and staff, including essential equipment like Global Positioning System (GPS) devices and night vision binoculars. The management is inadequately equipped for disseminating conservation awareness.

**Recommendations-** The management recommendations include studies to optimize fish populations as sustainable food base for the birds, foraging habits of birds across different wetlands, including paddy fields, improved facilities and interpretation programmes for tourists, particularly for young students, and better

equipment and facilities for staff.

## 9. Rollapadu WLS, Andhra Pradesh (2023-24):

Dedicated to the Great Indian Bastard (GIB), the Rollapadu WLS was established in 1998, extending over to 6.14 Km<sup>2</sup> is located in Kurnool district, within Srisailam TR. Predominantly a grassland, the PA includes 10 species of mammal, 124 species of bird and 12 species of reptile. Though the GIB has not been sighted in the area in recent times, Lesser Floricans and several grassland bird species are occasionally observed. A well-developed education and interpretation setup attracts local tourists. Local people are generally supportive of the management.

The sanctuary is isolated and surrounded by rapidly changing land use, which threatens its ecological integrity. The GIB population is believed to have declined beyond recovery, posing a significant conservation challenge. Growing population of Blackbuck in the area is a cause for concern for the farmers.

**Recommendations** - The management recommendations include improved management of Blackbuck population to reduce conflict with farmers, improved habitat management and inventory for conservation of grassland avifauna, improvement of biodiversity documentation, consolidation of the areas recently added and addition of more grasslands, and development of a participatory avian conservation programme for protection and reporting of nests and eggs in the area.

## 10. Sri Lankamalleswara WLS, Andhra Pradesh (2023-24):

Extending over an area of 465 Km<sup>2</sup>, the PA was established in 1998. It is located within the Lankamala RF in Kadapa district, a region known for its Red Sanders trees. It features a mix of dry deciduous forests, scrubland, and rocky hills, forming the catchment of the locally important Pennar river. Crucial for the conservation of the endemic and economically valuable Red Sanders, the PA is primarily dedicated to the conservation of Jerdon's Courser, a critically endangered bird species that was believed extinct until its rediscovery in 1986. Despite no recent sightings, evidence of its presence, such as recorded calls, has been found. The area also supports other species like the Sloth Bear, Four-Horned Antelope, Star Tortoise, Monitor Lizard, and leopard. The PA connects to Nagarjunsagar-Srisailam TR towards the north and is an important part of the regional tiger landscape. The staff is adequately equipped with appropriate focus on environmental education and local community is generally conservation supportive.

The management challenges include presence of

several religious shrines within the sanctuary and periodic unregulated movement of the pilgrims, protection of the high value Red Sanders, diverting attention and resources from other biodiversity conservation efforts, poor protection infrastructure, inadequate biodiversity inventory, grazing in the fringe areas, and inadequate participation of EDCs in conservation efforts.

**Recommendations-** The management recommendations include re-assessment of the status of Jerdon's Courser and exploration of techniques such as cloning and captive breeding of the bird in collaboration with expert agencies, increase in the number of staff and expansion and strengthening of protection camps, unifying the PA administration under single management unit, improved involvement of EDCs in PA management, and development of education and interpretation programmes, particularly related to Red Sanders and Jerdon's Courser, including setting up a museum at Kadapa, for a wider public outreach.

**Trend of MEE scores between first and repeat cycles**

Sl. No	PAs	First Cycle			Repeat Cycle			Trend
		Phase	MEE Score (%)	Category	Evaluation Year	MEE Score (%)	Category	
1	Papikonda NP	2006-2009	45.5	Fair	2018-2019	60	Good	▲
2	Kambalakonda WLS	2017-2018	65	Good	2022-2023	59.68	Fair	▼
3	Kolleru WLS	2012-2013	53.33	Fair	2022-2023	61.29	Good	▲
4	Koundinya WLS	2017-2018	65	Good	2022-2023	56.25	Fair	▼
5	Rajiv Gandhi (Rameswaram) NP	2017-2018	55	Fair	2022-2023	54	Fair	▼
6	Sri Penusila Narasimha WLS	2015-2017	57.5	Fair	2022-2023	51.56	Fair	▼
7	Sri Venkateswara NP	2009-2010	70.31	Good	2022-2023	63.71	Good	▼
8	Nellapattu WLS	2018-2019	65	Good	2023-2024	69.53	Good	▲
9	Rollapadu WLS	2018-2019	65	Good	2023-2024	78.13	Very Good	▲
10	Sri Lankamalleswara WLS	2018-2019	59.17	Fair	2023-2024	73.44	Good	▲
11	Coringa WLS	2012-2013	60	Good	-	CMPA	-	-
12	Gundla Brahmeswara WLS	2006-2009	46.2	Fair	-	TR	-	-
13	Krishna WLS	2018-2019	69.17	Good	-	CMPA	-	-
14	Pulicat Lake WLS	2017-2018	73.33	Good	-	CMPA	-	-



# Arunachal Pradesh



Mishmi Takin © Gaurav PJ



## Anrunachal Pradesh

Arunachal Pradesh, located in north-eastern India with a geographical area of 83,743 Km<sup>2</sup>, is renowned for its extensive forest cover, which plays a pivotal role in the state's ecology and economy. The state's forest cover is approximately 65,882 Km<sup>2</sup>, making up 78.67% of its total area (ISFR 2023). In the first cycle of the MEE, a total of 11 PAs are assessed, and in the repeat cycle, 12 PAs are evaluated. In the repeat cycle, 2 new PAs are part of the assessment, and 1 PA that was part of the assessment in the first cycle is excluded, as it is currently part of a TR which undergoes a separate MEE assessment.

### 1. Sessa Orchid WLS, Arunachal Pradesh (2018-19):

The sanctuary is part of a greater conservation landscape and is connected to Eagle Nest WLS and Doimara RF of Khellong forest division, and Pakke TR. Representing subtropical and temperate climatic zones, the PA is home to about 200 species of orchids. The Orchid Research Centre at Tipi under Itanagar silviculture division is close by. Local communities are supportive of the management. The PA is administered under the Khellong forest division, with no dedicated staff for the PA. The PA further suffers from extremely poor management infrastructure, absence of visitors' facilities, absence of participatory eco-tourism; and absence of NGO participation.

**Recommendations** - The key recommendations for Sessa WLS include the establishment of a dedicated Wildlife Division to independently administer Sessa WLS and neighboring sanctuaries. It is essential to post necessary staff within the PA and integrate the Tipi Orchid Research Centre for in-situ orchid conservation and livelihood generation for local communities. Improving protection infrastructure and management capabilities is crucial, along with developing and implementing an eco-tourism plan. Additionally,

constructing an interpretation center, ensuring proper documentation and monitoring with the assistance of researchers and NGOs, and securing sufficient funding will further support conservation efforts.

### 2. D'Ering Memorial (Lali) WLS, Arunachal Pradesh (2022-23):

A game reserve of the British time, the 190 Km<sup>2</sup> PA was notified in 1978 and renamed in 1986. Bordered by rivers Siyang and Sibya, it is the only grassland-flood plain PA of Arunachal Pradesh, functioning as an important constituent of the D'Ering-Mebo Elephant Corridor towards the north-east, and the tenuous D'Ering-Dibru-Saikhowa Corridor to the south-east. An Important Bird and Biodiversity Area (IBA) with significant population of birds like Bengal Florican, the PA is a prominent elephant area and also has a small population of Water Buffaloes. There is a management plan in place. An NGO, namely, D'Ering Wildlife Foundation and Eco-Development Society works with the management on people-PA issues. It is close to Pasighat town.

Surrounded by the Adi tribal community, for whom hunting of wild animals is of high socio-cultural and political significance, the relatively gentle terrain of the

flood plains and seasonal floods, the boundary ambiguity with Assam in the south, and presence of grazers' camp (khuti) in the PA, provide tough management challenges. Inadequate staff number, mobility and facilities, shortage of funds, absence of education-interpretation and tourism infrastructure, and progression of shrubby vegetation in grasslands compound management problems.

**Recommendations** – To address boundary ambiguity with Assam, it is essential to initiate resolutions that clarify territorial lines. Additionally, improving the PA protection infrastructure and enhancing accessibility by both water and land routes will significantly bolster conservation efforts. Implementing systematic habitat improvement programs is necessary to combat shrub and tree invasion in grasslands.

Furthermore, developing income-generating participatory programs, such as eco-tourism in collaboration with tribal communities, can help discourage traditional hunting practices. Establishing a visitors' center and an interpretation center in Borguli village will enhance education and awareness among visitors. Improving coordination with the territorial administration is also crucial for effective management. Lastly, management plans should be prepared in accordance with the guidelines established by WII.

### 3. Dibang WLS, Arunachal Pradesh (2022-23):

Located in the north-eastern corner of the country, the PA spans 4,149 Km<sup>2</sup> and was notified in 1998. Renowned for its stunning beauty and high altitudinal gradient, it is part of the Dibang-Dihang Biosphere Reserve, with tiger sightings reported from the Mishmi hills at 3,630 m above sea level. The PA boasts rich biodiversity, hydrological significance, and cultural value, making it a haven for nature lovers. Consultations are underway to elevate the PA to a TR.

Administered by the DFO (Social Forestry) in Anini, the PA faces challenges including inadequate protection infrastructure, staff shortages, poaching of Takin and Musk Deer near the international border, and the absence of a visitors' center, nature education programs, and publicity. Verification and demarcation of PA boundaries are necessary. The area also experiences heavy armed forces presence due to its location, along with ongoing road construction and widening. Local tribal communities, primarily the Idu Mishmi, have customary claims in and around the PA and are apprehensive about the future of their rights, including customary hunting privileges.

**Recommendations** – To enhance management of the PA, it is essential to conduct a thorough survey and

demarcation of its external boundaries. Finalization of zonation within the PA should involve a consultative process. Community-centric eco-tourism and ecodevelopment programs must be organized to discourage traditional hunting and improve local livelihoods.

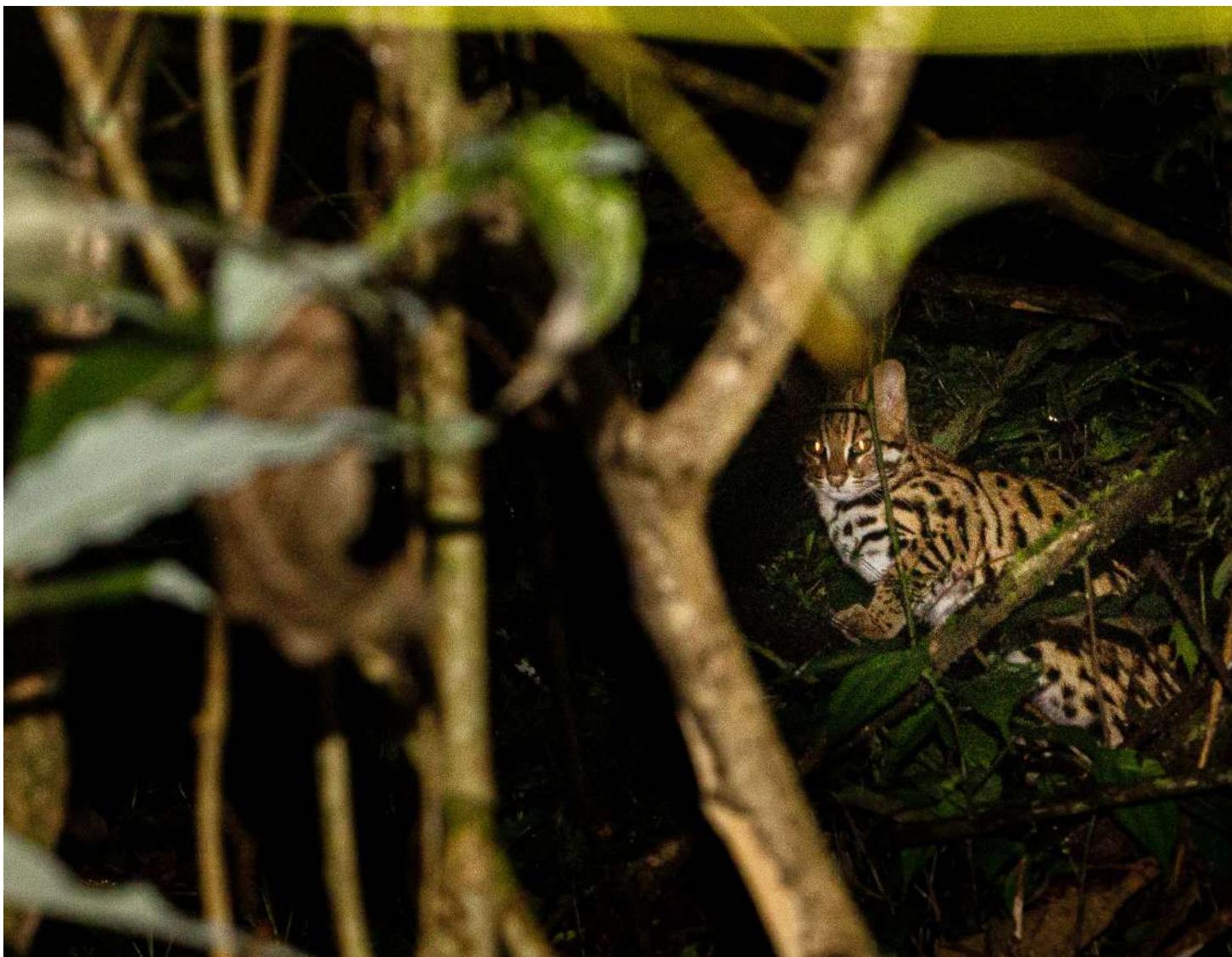
Establishing Anini as the PA headquarters with an independent DFO and developing visitors' and interpretation infrastructure will strengthen operations. Adequate staffing and improved training and facilities are necessary for effective management. Building institutional relationships with defense organizations will aid in sensitizing them to conservation efforts and garnering support for protecting the interior forests. Finally, actively pursuing the upgrade of the PA to a TR is crucial for long-term conservation.

### 4. Eagle Nest WLS, Arunachal Pradesh (2022-23):

A quaint nest of nature, the PA with 218 Km<sup>2</sup> area, was notified in 1989. It is a part of the 3500 Km<sup>2</sup> Kameng PA complex, the largest contiguous, closed-canopy forest tract of Arunachal Pradesh, and also forms a part of the Kameng ER. Along with the adjacent Sessa Orchid WLS, the PA is designated a unit of Conservation International Himalaya Biodiversity Hotspot Area and an IBA. Elephants move from Assam plains upto 3280 m. at Eagle Nest ridge within the PA. Significant historical-cultural values associated with camping of Reverent Dalai Lama in the PA during Indo-China war of 1962. The Singchung Bugun Village Community Reserve, extending to 30 Km<sup>2</sup> over Bugun tribe's land, abuts the PA, and is an outstanding example of participatory wildlife management. The rare bird *Bugun liocichla* is named in honour of the Bugun tribe. An excellent interpretation centre and a management plan are in place, developed through a consultative process between the Buguns and PA management.

Significant management weaknesses include acute staff shortages, insufficient funding, and inadequate eco-development efforts along the southern boundary. The annual migration of the Shertupken tribe from southern areas and their traditional hunting practices further complicate conservation efforts. Additionally, the non-representation of the FD in the District Development Council hinders effective collaboration, while the lack of adequate ecological research and monitoring impairs informed decision-making.

**Recommendations** – To enhance the PA, it is essential to upgrade its status to that of a Division, ensuring sufficient staffing along with proper infrastructure and equipment. Action should be taken to include the FD in



the District Development Council of West Kameng to improve cross-sectoral coordination, thereby enhancing PA-people relations and protection efforts.

Making the Foothill-Chaku-Tenga (FCT) road an all-weather route will facilitate more effective PA protection. Eco development programs should be expanded to include collaborations with the Shertupken and Aka communities, similar to ongoing efforts with the Buguns. It is also important to prepare a management plan in accordance with WII guidelines and compile available socio-ecological information for broader dissemination. Regular training on modern wildlife management should be organized for staff and community organization members, while improving funding for the PA will further support these initiatives.

## **5. Itanagar WLS, Arunachal Pradesh (2022-23):**

Bounded by rivers and streams, the 140.3 Km<sup>2</sup> area was notified in 1978. Dominated by the Assam Valley semi-

evergreen forest and Bamboo groves, the PA harbours a rich assemblage of important plants and animals of north-east Himalaya, and ensures drinking and irrigation water to Itanagar Capital Region and neighbouring towns and villages. At a landscape scale, the PA connects with Pakke TR through the intervening forests. Itanagar Biological Park and Ganga lake within the PA offer excellent platforms for conservation education and nature tourism. There are many national and regional scientific and cultural institutions at Itanagar. A management plan is in place, albeit for five years.

The PA suffers from severe land-use conflict due to presence of notified Itanagar Capital Region within the notified boundaries of the PA and Drupong RF. Substantial construction activities by the governmental and private agencies and individuals are creating legal, administrative and socio-political difficulties for PA management. Poor protection infrastructure, inadequate staff numbers, capacities and facilities, lack of baseline information and



*Leopard cat © Naitik*

ecological monitoring, and absence of EDCs are weakening the management. The biological park and rescue centre are located within the PA, with independent administration.

**Recommendations** – Under the guidance of the recently constituted High Power Committee, it is crucial to resolve the land overlap issue between the PA and the Itanagar Capital Region, considering the historical, cultural, ecological, legal, and administrative aspects of land ownership. The rationalization process should also explore the addition of community forests located north of the Poma range to mitigate any potential loss of PA area.

Moreover, examining the declaration of Itanagar as a Biodiversity Heritage Site under the Biological Diversity Act will help protect its natural and ecological integrity. Developing tourism infrastructure at Ganga lake and promoting community-based eco-tourism will enhance local engagement. Involving scientific institutions in ecological research and monitoring is

essential, as is conducting regular nature education programs in collaboration with the biological park. Improvements to the approach road to the PA, enhanced cross-sectoral coordination, and increased funding for the PA will further support these initiatives.

## 6. Kamala WLS, Arunachal Pradesh (2022-23):

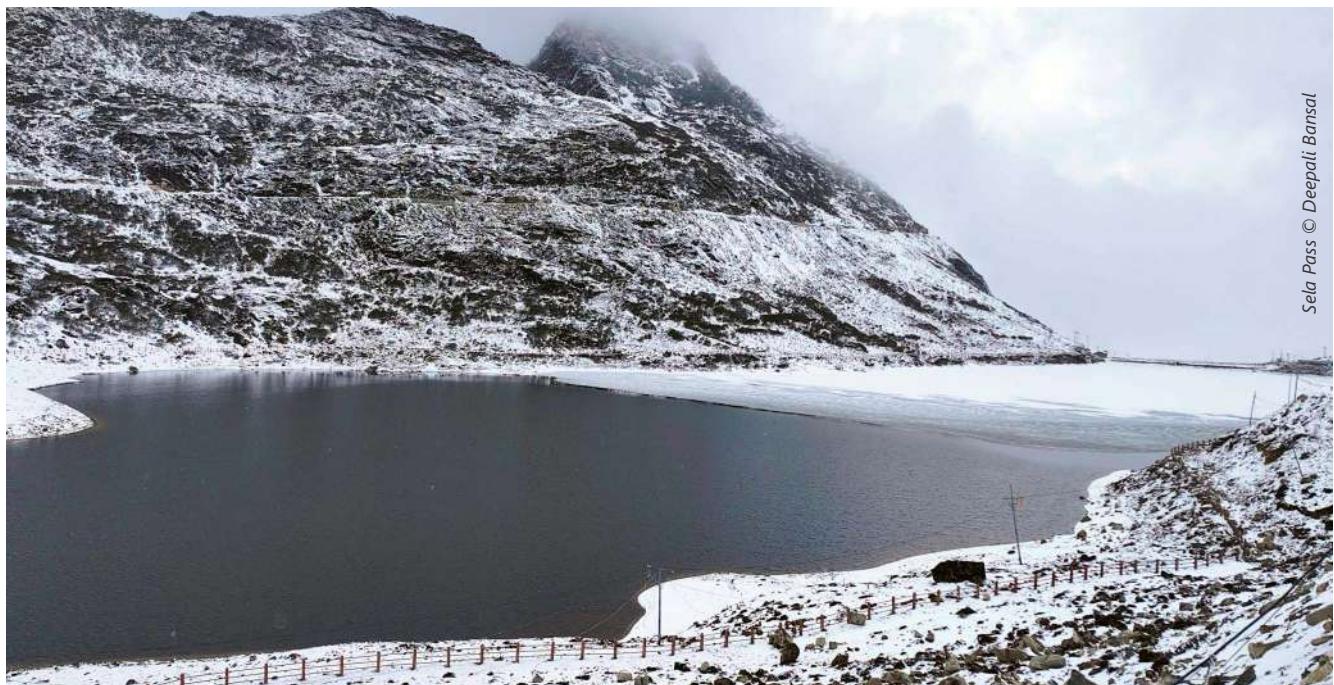
The PA with an area of 77.607 Km<sup>2</sup>, was notified in 2015. A mountainous area, consisting of unending range of hills and valleys, the PA has eastern sub-montane semi-evergreen to sub-tropical deciduous forests with secondary moist Bamboo brakes scattered all over. Home to many eastern Himalayan Rare Endangered and Threatened (RET) floral and faunal species, the PA is bordered by the river Subansiri in the east and river Kamala in the south, and possesses important geomorphological, biological, ecological, cultural and aesthetic values. ESZ was proposed in 2021, approval is still pending.

The PA virtually exists on paper, as it does not have sanctioned posts of staff, nor funds and infrastructure. It does not have a management plan and lacks relevant information on PA values and other attributes. There are 11 villages in the north and west, with many villagers claiming to have been erroneously included in the PA. Serious PA-people conflict exists, as locals are divided over the continuation of the PA. The DFO Daparijo has recently asked CWLW to constitute a committee to resolve the issue.

**Recommendations** – It is essential to resolve the conflict with local communities regarding the establishment of the PA and the ESZ as a priority. Upgrading the PA to the status of a Range, along with sanctioning adequate staff, funding, and protection infrastructure, is vital for effective management. A management plan should be prepared in accordance with WII guidelines to guide conservation efforts. Additionally, involving local NGOs and institutions in nature education initiatives will enhance engagement with local communities and foster cooperation in conservation efforts.

## 7. Kane WLS, Arunachal Pradesh (2022-23):

The Kane WLS, a small yet significant PA located in the eastern Himalayan foothills, plays a critical role as an elephant corridor connecting the hilly regions of Arunachal Pradesh with the Assam plains. Established on land donated by the Taipodia clan of the Galo tribe, the sanctuary covers 31 sq.km and is managed under the Likabali territorial division. Despite its importance, Kane WLS faces numerous management challenges, including a lack of dedicated staff, insufficient financial



Sela Pass © Deepali Bansal

resources, and threats from traditional rights exercised by local communities. Additionally, the ongoing widening of the Likabali-Aalong road increases vulnerability to wildlife accidents and illegal activities. The sanctuary's management strengths lie in its compact forested habitat, strong community ties, and potential for ecotourism and conservation education. However, it requires urgent attention to address its management weaknesses and optimize its ecological value.

**Recommendations—** To enhance wildlife management, it is crucial to expedite the proposal for creating an independent range at Nigup, equipped with dedicated staff, infrastructure, and necessary equipment. Additionally, launching formal participatory programs with the Kane and Magi villages will help develop livelihood support initiatives. Strengthening the Magi Basti Eco-friendly Society will facilitate better management of religious tourism at Akashi Ganga. Furthermore, establishing a small information center at Likabali will aid in disseminating conservation information to the community and visitors.

### 8. Mouling NP, Arunachal Pradesh (2022-23):

Often referred to as 'cradle of biodiversity of Arunachal Pradesh', the PA with an area of 483 Km<sup>2</sup> was notified in 1986. One of the two NPs in the state, the PA is remotely located without any access road. A range of habitats occur in the PA due to altitudinal variation, providing habitats to a number of endemic flora and fauna of eastern Himalaya. A biodiversity 'hot spot', the NP also forms the western part of Dehang-Dibang Biosphere Reserve. With outstanding biodiversity, hydrological,

cultural and aesthetic values, the PA has high eco-tourism potential.

About 30 villages exist, mostly of Adi tribe, around the PA, for whom the hunting of wild animals is an age-old socio-cultural and political activity. Acute shortage of staff and funds, remoteness and lack of accessibility to PA, unscientific upkeep of interpretation centre and orchidarium at Jengging, traditional hunting and movement by resident tribal communities in the PA, and absence of baseline information, PA publicity and nature education programmes, are major management weaknesses.

**Recommendations—** It is essential to conduct a survey and demarcate the boundaries of the PA while increasing staffing levels, facilities, and funding. The existing interpretation center and orchidarium should be improved and utilized as resources for nature education. Engaging local communities in the planning and implementation of a community-based eco-tourism program will help generate revenue for residents. Additionally, constructing a motorable road in the southern part of the PA will facilitate patrolling, monitoring, and eco-tourism efforts. Efforts should also be made to reduce local hunting through participatory income generation activities, and ecological research and monitoring initiatives should be initiated to enhance conservation outcomes.

### 9. Ringba-Roba WLS, Arunachal Pradesh (2022-23):

Located in the high rainfall zone, the community land extending to 49.20 Km<sup>2</sup> was donated by the local people to the government and was initially notified as a

WLS in 2013. Final notification was issued in 2015. Dominated by sub-tropical evergreen forests and Bamboo brakes, the PA has a rich assemblage of flora and fauna of eastern Himalaya. Naturally protected in the north by the river Menga, the area has two natural lakes, namely Ringba and Roba, which attract migratory birds in winter.

The PA is a beat of Taliha range in Daporijo division. Soon after the issuance of final notification, Panchayat representatives and locals raised objections on the establishment of the PA. The staff is unable to enter the PA due to strong resistance by locals. The PA also does not have sanctioned staff, and funds for management and protection. It does not have a management plan, nor any management activity. Recently, DFO Daporijo requested CWLW to constitute a committee to remove the stalemate. Presently, the PA exists only on paper.

**Recommendations-** It is imperative to resolve the conflict with local communities regarding the establishment of the PA and ESZ as a priority. Upgrading the PA to the status of a range, along with sanctioning adequate staff, funding, and protection infrastructure, is vital for effective management. A comprehensive management plan should be prepared based on WII's guidelines. Additionally, involving local NGOs and institutions in nature education initiatives will enhance community engagement and support conservation efforts.

## 10. Mehao WLS, Arunachal Pradesh (2023-24):

Nestled in the Mismi hills of Lower Dibang valley district, Mehao WLS, with an extent of 281.50 Km<sup>2</sup>, was notified in 1980. The PA's altitude varies from 350 m to 3568 m, resulting in diverse forest types from tropical evergreen to temperate coniferous forests. It has rich biodiversity, with about 200 species of birds, 13 snakes, 6 fishes, 232 butterflies, and 60 species of mammals like the Clouded Leopard, Marbled Cat, Himalayan Black Bear, and endangered species like Mishmi Takin and Hoolock Gibbon. Managed by the office of the DFO, Roing, the PA has also recorded the presence of tiger and Snow Leopard. The local Idu Mishmi tribe shares a deep connection with nature, promoting conservation through traditional beliefs like Gena. Places like the Mehao lake, Sally lake, Mini lake and Mayodia pass are popular tourist destinations, offering snow-covered landscapes and pristine nature. The area is well protected and is potentially a high value participative scenic and education area.

Management challenges include presence of 14 proximate villages along southern boundary and consequent biotic disturbances including

encroachment, hunting and illegal tree felling, insufficient staff, lack of boundary demarcation, inadequate infrastructure, data deficiency on biodiversity, inadequately developed participatory eco-tourism programmes and a shortage of anti-poaching camps (APCs).

**Recommendations -** Management recommendations include improved wildlife management practices, increase in staff numbers, skills and knowledge, improve linkages with local community and develop community-run eco-tourism, and regulate visitor flow.

## 11. Tale WLS, Arunachal Pradesh (2023-24):

Located between Lower Subansiri and Kamle districts, the PA, extending over 337 Km<sup>2</sup>, was notified in 1995. Located about 16 km away from the famous town of Ziro, the PA is administered by the DFO Hapoli. Exhibiting an altitudinal range from 1200 to 3000 m., the PA exhibits unique ecosystems with altitudinal gradient, hosting rare species of broad-leaved trees and conifers of undisturbed and pristine forests. It supports diverse fauna, including Clouded Leopards, Himalayan Black Bears, and 409 bird species such as Blyth's Kingfisher and Ward's Tropic. The PA is named after a variety of wild onion, named Tale, and is a home of conservation friendly tribe, named Apatani. The PA is adequately supported by the institutions and NGOs like Ashoka Trust for Research in Ecology and the Environment (ATREE), Arunachal Birding Club and Ziro Birding Club. Mostly free of Human-Wildlife Conflicts(HWCs), the PA is recognized to have the first EDC in the state, named Tale EDC.

Management challenges include inadequate dedicated administrative infrastructure and support, as the PA is not even a range, inadequate number of frontline staff and inadequate training to the existing staff for managing such an important conservation area, poor protection infrastructure, poor biodiversity documentation, and issues related to timely release of funds.

**Recommendations-** The management recommendations include creation of a separate wildlife division for the PA and posting of adequately trained staff, improved protection infrastructure, including upgradation of Pange APC to a range office, improved interpretation and education infrastructure and programmes, enhancing collaboration with scientific institutions and NGOs for biodiversity inventory and research, regulation of tourism in Tale valley camp and development of community-driven eco-tourism programmes, including setting up of an interpretation centre.

## 12. Yordi Rabe Supse WLS, Arunachal Pradesh (2023-24):

Located in the West Siang district, the 397 Km<sup>2</sup> area of the PA was notified in 1996, but the boundaries could be notified only in 2007 due to resistance from the local communities. Administered by the DFO, Along, the PA exhibits rugged terrain and altitudinal gradient from 1500 to 3950 m, and harbours pristine dense forests consisting of a mix of deciduous, tropical evergreen and coniferous forests. The wildlife includes tigers, Clouded Leopards, Asiatic Black Bears, Serow, Goral and endangered birds like the Rufous-necked Hornbill. Presence of Takin has also been reported. The area is less disturbed due to its remote location.

The PA management continues to suffer from boundary dispute with the local communities and non-settlement of their user rights. The other challenges include lack of public awareness about the values of the PA and inadequate cooperation with local

communities, continuance of traditional resource use practices within the area, including hunting as cultural practice, inadequate administrative and protection infrastructure, including sufficient staff and staff outposts, and absence of biodiversity inventory and information.

**Recommendations** - The Recommendations include creation of an independent wildlife division, continued dialogue and negotiation with the local tribal communities to resolve disputes relating to boundary demarcation and traditional resource use, development of eco-development programmes, including participatory eco-tourism, improved staff numbers, skills and knowledge and strengthening of protection infrastructure, and initiation of collaborative biodiversity inventory and research programmes.

*Trend of MEE scores between first and repeat cycles*

Sl. No	PAs	First Cycle			Repeat Cycle			Trend
		Phase	MEE Score (%)	Category	Evaluation Year	MEE Score (%)	Category	
1	Sessa Orchid WLS	2006-2009	71.2	Good	2018-2019	52.5	Fair	▼
2	D'Ering Memorial (Lali) WLS	2012-2013	60	Good	2022-2023	60.16	Good	▲
3	Dibang WLS	2017-2018	55.56	Fair	2022-2023	53.91	Fair	▼
4	Eagle Nest WLS	2006-2009	72.7	Good	2022-2023	68.75	Good	▼
5	Itanagar WLS	2017-2018	52.59	Fair	2022-2023	51.56	Fair	▼
6	Kamala WLS	-	-	-	2022-2023	29.69	Poor	-
7	Kane WLS	2015-2017	50	Fair	2022-2023	48.44	Fair	▼
8	Mouling NP	2012-2013	54.17	Fair	2022-2023	57.81	Fair	▲
9	Ringba-Roba WLS	-	-	-	2022-2023	26.56	Poor	-
10	Mehao WLS	2018-2019	42.5	Fair	2023-2024	67.19	Good	▲
11	Tale WLS	2018-2019	62.5	Good	2023-2024	80.47	Very Good	▲
12	Yordi Rabe Supse WLS	2018-2019	57.5	Fair	2023-2024	57.81	Fair	▲
13	Kamlang WLS	2015-2017	51.09	Fair	-	TR	-	-

Assam

Indian Hog Dear © Rupali Thakur





## Assam

Assam, located in north-eastern India with a geographical area of 78,438 Km<sup>2</sup>, has a forest cover of approximately 28,313.55 Km<sup>2</sup>, which is 36.10% of its total area (ISFR 2023). In the first cycle of the MEE, a total of 17 PAs are assessed, and in the repeat cycle, 17 PAs are assessed. However, in the repeat cycle, 1 PA is newly evaluated, and 1 PA that was part of the first cycle assessment is excluded, as it is part of a TR which undergoes a separate MEE assessment.

### 1. Pobitora WLS, Assam (2018-19):

Located near the town of Guwahati, covering 38.84 Km<sup>2</sup> area the PA is a home to the globally threatened *Rhinoceros unicornis*. The population of Rhinos has been increasing progressively, and the management is planning to spare some rhinos for the Indian Rhino Vision 2020 to Manas NP. A popular tourism place, the PA is frequented by large numbers of visitors, including policy makers, senior bureaucrats and educational institutions. The PA is an isolated island without natural boundaries and ecological connectivity. Demarcated with man-made boundary, the PA experiences intense cattle grazing. The PA is a flood-driven ecosystems, however, occasional heavy floods affect the Rhino population adversely.

**Recommendations** - Important recommendations include the immediate preparation and implementation of a scientific management plan for the PA. Enhancements to protection infrastructure are crucial, including the development of staff housing, roads, and bridges. Additionally, improving grasslands is necessary to enhance the quality of Rhino habitat. Finally, ensuring the provision of sufficient funds and their timely availability is essential for successful management and conservation efforts.

### 2. Amchang WLS, Assam (2020-22):

The PA, known as the green lung of Guwahati, is characterized by numerous water bodies but faces significant challenges. Rail lines and NH 37 disrupt its continuity, and additional protection is needed through the Assam Forest Protection Force. Currently, there is no management plan in place, and encroachments along the western boundary remain unaddressed. Industrial activities, such as coke production, brick kilns, and cement processing, occur dangerously close to the PA.

Management weaknesses include inadequate wildlife training, insufficient physical infrastructure, limited funding, and a lack of publicity, education, interpretation, eco-tourism, research monitoring, and community involvement. Recommendations from the last MEE have not been implemented.

**Recommendations** - To address these issues, Recommendations include regulating land use around the PA, converting tea plantations within the PA into suitable habitats for Gaur and elephants, taking action to close industrial units operating in the banned zone of the ESZ, and constructing boundary pillars to enhance the visibility of the PA.

### 3. Chakrasila WLS, Assam (2020-22):

The PA, covering 45.8 Km<sup>2</sup>, was established for the conservation of the Golden Langur, whose population is on the rise. However, it is currently managed by the territorial DFO, and while the Wildlife Trust of India (WTI) supports veterinary needs, a comprehensive management plan is lacking.

Management weaknesses include inadequate wildlife training, insufficient physical infrastructure, limited funding, and a lack of publicity, education, interpretation, eco-tourism, research monitoring, and community participation. Additionally, the recommendations from the last MEE have not been addressed.

**Recommendations** – To enhance management of the PA, it is essential to appoint an independent manager dedicated to its oversight. Additionally, all existing vacancies should be filled promptly. A new management plan must be prepared to guide conservation efforts effectively. Improving networking with neighboring forest areas will be crucial for securing the habitat of the Golden Langur. Moreover, activating EDCs is necessary, along with taking action to address existing management weaknesses.

### 4. Deepor Beel WLS, Assam (2020-22):

The PA is a wetland that is ecologically linked to the Rani-Garbhanga RF and forms part of the Deepor Beel Ramsar site. It also serves as an elephant corridor and is located on the southern side of Guwahati, near educational institutions. A district coordination committee is in place, and the ESZ was notified in 2021. However, there are significant challenges, including a municipal waste dumping site near the PA and sewage being released into the wetland. Additionally, a train line and state highway traverse the area, and a management plan is currently lacking.

**Recommendations** – To address these issues, Recommendations include preparing a comprehensive management plan, re-aligning the railway line to preserve the elephant corridor, and regulating land use changes around the PA. Efforts should be made to shift the municipal dumping site and improve sewage treatment. Furthermore, enhancing eco-tourism, nature education, and research monitoring, as well as improving human and financial resources, are vital for effective management.

### 5. East Karbi Anglong WLS, Assam (2020-22):

The PA covering 221.24 Km<sup>2</sup> area is contiguous with Kaziranga and forms part of the Kaziranga-Karbi

Anglong ER, featuring excellent habitat diversity and negligible biotic disturbance. The local community is generally supportive of the PA; however, it is currently managed by a neighboring territorial division. Although a management plan has been submitted, it has not yet been approved. Significant weaknesses in management include inadequate wildlife training, insufficient physical infrastructure, limited publicity and nature education, and the absence of eco-development initiatives. Furthermore, no action has been taken on the last set of recommendations provided.

**Recommendations** - To address these issues, Recommendations include creating a full-fledged wildlife division for the PA, gaining approval for the management plan, demarcating the boundary on the ground, establishing EDCs, and developing eco-tourism initiatives focused on improving local livelihoods. Immediate efforts should be made to work towards removing existing management weaknesses.

### 6. Garampani WLS, Assam (2020-22):

This small PA covering 6.22 Km<sup>2</sup> area serves as an important elephant corridor within the Kaziranga-Karbi Anglong landscape. It is managed by a neighboring territorial division and is a popular tourism destination, known for its hot sulphur springs, orchids, and diverse bird species. The PA experiences negligible biotic disturbances; however, it lacks a management plan. Management weaknesses include inadequate physical infrastructure, limited publicity and interpretation, absence of baseline information, and insufficient wildlife training.

**Recommendations** - Recommendations include preparing a comprehensive management plan, securing connectivity to adjacent PAs and RFs, establishing an independent wildlife division, protecting the sulphur springs while enhancing nature interpretation and education, and taking necessary actions to address existing weaknesses.

### 7. Sonai-Rupai WLS, Assam (2020-22):

The PA, covering 170 Km<sup>2</sup>, is part of a larger landscape and is contiguous with Orang WLS and Nameri TR. It was notified in 1998, with the undisturbed portion designated as a satellite core of Nameri TR, and serves as a Pygmy Hog reintroduction site. An ESZ has been notified, but there is currently no management plan in place. Approximately half of the PA has been encroached upon, and the settlement of these encroachments remains pending. Additionally, publicity regarding the PA is inadequate, and grassland management needs improvement.



**Recommendations** - Recommendations include aligning and integrating the management plan with Nameri TR, controlling the invasion of shrubs and weeds in the grasslands, and conducting year-round monitoring of elephant movement. Regular monitoring of grassland fauna, particularly Pygmy Hogs, is essential, as is improving baseline information. Finally, staff training in wildlife management should be prioritized.

### 8. Borail WLS, Assam (2022-23):

Extending to 326.25 Km<sup>2</sup>, the PA, located in foothills of Barail hill ranges in Barak valley, was notified in 2004. Administered by two territorial divisions, the PA is divided by river Jatinga, which cuts through it. With high altitudinal gradient, the PA exhibits a range of habitats and has highest diversity of primates in Assam, viz., 8 species. The only surviving ape in India, Hoolock Gibbon has good population. The PA is a part of about 1500 Km<sup>2</sup> forested landscape, connected with Karbi

hills in the north east, and Narpuh-Saipung WLS of Meghalaya in the south, linked further to Chittagong hills in Bangladesh.

There are 42 villages around the PA causing heavy biotic disturbance. There have been reports of activities in the PA. Being managed under two different territorial divisions, without dedicated staff for PA management, the protection is inadequate. PA suffers from low funding, untrained man power, absence of ecological research and monitoring, and publicity and interpretation activities. No, Annual Plan of Operations (APO) classifying wildlife management activities and financial allocations.

**Recommendations** – To enhance wildlife conservation, it is essential to create an independent wildlife division with the necessary supervisory and frontline staff, amenities, and protection infrastructure. The management plan should be revised in accordance with WII's guidelines. Actively involving local people in developing income-generating programs, such as eco-



tourism, can help prevent youth from entering extremist activities. Improvements to existing eco-tourism infrastructure and programs are also necessary. Additionally, conducting ecological monitoring of primates and integrating wildlife management prescriptions with the working plans of neighboring territorial divisions will strengthen overall conservation efforts.

## 9. Bherjan-Borajan-Padumoni WLS, Assam (2022-23):

Surrounded by tea gardens and human settlements, the 7.21 Km<sup>2</sup> PA, consisting of three disjunct patches of forests, carved out from two territorial divisions in Tinsukia district, was notified in 1999, primarily to protect Hoolock Gibbon. Although, fragmented and with wide open canopies, the forests are rich in biodiversity. A total of 114 tree species, 24 mammals, including 6 primates, and 200 birds have been documented in the PA. Local communities are

supportive of management, which has formed village EDCs for undertaking participatory activities for mutual benefit.

The fragmented nature of forests, high biotic disturbance, acute shortage of staff and funds, inadequate protection infrastructure, absence of systematic ecological monitoring, and legacy of past extremist activities constitute major management challenges.

**Recommendations** – To improve wildlife management, it is crucial to fill vacancies for Assistant Conservator of Forests (ACF) and frontline staff. Regular wildlife training should be provided to staff, and protection infrastructure should be enhanced, including fencing the PA at strategic locations. Sufficient funds must be allocated in a timely manner to support these efforts. Involving local NGOs in education, awareness, and training activities will further promote conservation. Developing nature education programs for local students and youth will foster a conservation mindset. Strengthening EDCs and establishing community-based eco-tourism initiatives will help improve local incomes. Additionally, systematic studies on endangered and endemic species should be conducted, along with systematic ecological monitoring of habitats and populations to ensure effective conservation strategies.

## 10. Dibru Saikhowa NP, Assam (2022-23):

The PA is located within the Indo-Burma Biodiversity Hotspot and the Assam Plains Endemic Bird Area. It lies in the floodplains of the Dibang and Lohit rivers and was originally designated as a WLS in 1986. Following boundary rationalization, it was upgraded to a NP in 1999, covering 340 Km<sup>2</sup>. Currently, it constitutes the core of the Dibru Saikhowa Biosphere Reserve, which includes surrounding buffer areas totaling 425 Km<sup>2</sup>. The management plan for the park is awaiting government approval. This NP serves as an important elephant corridor and is home to riverine ecosystems that harbor Dolphins and Gharials—the latter being the first recorded in the area. While 110 families have been relocated from the PA, two villages within it continue to exert heavy biotic pressure. The ongoing rehabilitation of families outside the PA faces challenges, including an acute shortage of staff and funds, inadequate protection infrastructure, a lack of systematic habitat restoration programs, and insufficient wildlife training for staff.

**Recommendations** – To address these issues, Recommendations include obtaining timely approval for the management plan, expediting the relocation of villagers from the PA, and allocating adequate human



and financial resources. Systematic wildlife training for staff should be organized, and urgent repairs to damaged protection camps are necessary. Involving EDCs in managing the visitor center in Guijan range and the interpretation center at the division headquarters is also important. Furthermore, efforts should be made to stabilize the sand banks in the islands and to conduct ecological research and monitoring.

### 11. Dihing Patkai NP, Assam (2022-23):

The PA, covering 231.65 Km<sup>2</sup> and divided into two parts by a river, is administered by two territorial divisions. It was originally notified as a WLS in 2004 and was upgraded to a NP in 2021. Part of the Dihing Patkai ER, the PA contains the largest stretch of lowland, dipterocarp-dominated, evergreen forests, supporting rich biodiversity, including seven species of wild cats. Additionally, it is recognized as a globally important site for the White-winged Wood Duck. Local NGOs and EDCs are engaged in awareness creation and HWC mitigation, and the Assam Forest Protection Force contributes to the area's protection. However, the PA faces management challenges, including inadequate human and financial resources, insufficient wildlife management focus, coordination issues between the two territorial divisions, fragmentation of the PA, absence of systematic ecological research and monitoring, and a lack of a management plan.

**Recommendations** - To address these challenges, Recommendations include creating an independent wildlife division for the PA, increasing human and financial resources, organizing systematic wildlife

training for staff, preparing a management plan according to WII's guidelines, and involving local NGOs and institutions in ecological research, monitoring, and animal census.

### 12. Hollongapar Gibbon WLS, Assam (2022-23):

This isolated PA, representing Assam Plain Alluvial Evergreen Forests and dominated by dipterocarps, was notified in 1997 and covers an area of 20.97 Km<sup>2</sup>. It aims to protect the Western Hoolock Gibbon and various primate species, including India's only nocturnal primate, the Bengal Slow Loris. The PA reportedly has the highest density of primate biomass in India, although its forests once extended to the foothills of the Patkai mountain range. A WhatsApp group has been established to involve villagers, railways, and PA staff in preventing elephant conflicts and accidental deaths along the railway line that passes through the PA. However, the PA is surrounded by tea estates, paddy fields, and semi-urban infrastructure. In 1965, 879 acres of the PA were leased to the Indian army, although that portion has remained unused. The PA faces challenges such as the absence of ecological contiguity, a lack of wildlife-trained staff, and insufficient monitoring of key faunal species.

**Recommendations** - Recommendations include expediting the process of transferring the unused leased area from the army to PA management, properly maintaining the six-km-long hanging elephant-proof electric fence, actively engaging with the local railway establishment for PA protection and garbage cleaning along the railway line, organizing systematic wildlife

training for staff, and involving local communities in income-generating participatory activities and education and awareness initiatives.

### **13. Marat Longri WLS, Assam (2023-24):**

Located in Assam's Karbi Anglong district, the PA spans 451 Km<sup>2</sup> and was notified on April 17, 2003. Named after a mythical bird, it comprises both RFs and district council RF. As the largest PA within the North-East Brahmaputra Valley (9A) Biogeographical Province, it features diverse ecosystems, including lush forests, water bodies, and varied terrain. The WLS is home to several conservation-priority species such as the Slow Loris, Pig-Tailed Macaque, Capped Langur, Leopard, Elephant, Wild Dog, Gaur, Stump-Tailed Macaque, Malayan Giant Squirrel, King Cobra, and Water Monitor Lizard. It is part of the Dhansiri Lumding ER and implements a well-organized protection strategy, effective HWC mitigation measures, and eco-development programs that include women-centric employment generation activities. The PA attracts birdwatchers and nature enthusiasts due to its rich avian diversity. Despite these strengths, the PA is administered under the territorial division and suffers from biotic disturbances like Jhum cultivation and livestock grazing from settlements within its boundaries. Other challenges include inadequately trained and deployed staff, the absence of an updated management plan, a lack of ecological information, insufficient interpretation programs, financial constraints, and occasional hunting by local communities.

**Recommendations** - Recommendations include placing the PA administration under a wildlife division, promptly updating the management plan, providing adequate wildlife training to frontline staff, improving financial flow, enhancing protection and interpretation infrastructure, developing community-centric eco-tourism programs, and conducting biodiversity-related research and monitoring.

### **14. Nambor WLS, Assam (2023-24):**

Located in the Karbi Anglong district, the PA extends over 37 Km<sup>2</sup> and was notified on July 27, 2002. It was carved out of the historically significant Nambor RF and is connected to the North Karbi Anglong WLS, which in turn links to Kaziranga NP. This PA forms an important part of the landscape that stretches to the forests in Nagaland, featuring excellent east Himalayan moist forests, Bamboo brakes, and marshy wetlands, locally known as Jee. Major animal species found in the PA include the elephant, Slow Loris, Black Bear, Capped Langur, Hoolock Gibbon, Gaur, Common Cobra, King

Cobra, Pangolin, and Jungle Cat. The management has established an effective patrolling strategy alongside HWC mitigation measures. However, significant limiting factors include habitat fragmentation, non-timber forest product (NTFP) collection, habitat degradation, illegal removal of forest produce, and a highway that passes through the WLS. The area is too small to support a sufficient prey base for large carnivores and is primarily utilized by migratory elephants. Additionally, the PA suffers from the absence of an approved management plan, inadequately trained and deployed staff, insufficient protection infrastructure, financial constraints, poor inter-divisional coordination, lack of ecological information, unregulated tourism, and vulnerability to local hunting.

**Recommendations** - Recommendations include promptly updating and approving the management plan, ensuring timely and adequate release of funds, filling staff vacancies, mapping and consolidating PA boundaries, merging the adjoining Garam Pani WLS with the PA, improving staff numbers, skills, and facilities, enhancing joint patrolling, upgrading protection infrastructure, conducting ecological research and monitoring, establishing interpretation and educational programs, and developing a regulated tourism program.

### **15. Nambor-Doigrung WLS, Assam (2023-24):**

Located in Golaghat district, the PA consists of three discontinuous units and spans 97.5 Km<sup>2</sup>, having been notified in 2003. Situated at the foothills of the Karbi Anglong hills, the PA is home to species such as Gaur, Elephant, Wild Dog, tiger, and leopard. It is an IBA that hosts around 160 bird species, including the Great Pied Hornbill and White-winged Wood Duck. The PA boasts rich endemic and endangered floral diversity with approximately 1,000 species of flowering plants and several species of lower plants. It has implemented a few eco-development programs and effectively manages HWC. However, the PA is surrounded by revenue villages, paddy fields, and tea gardens, resulting in significant biotic disturbances, including occasional illegal hunting. Challenges include the absence of an approved management plan, 40% staff vacancies, poor protection infrastructure, inadequately trained and deployed frontline staff, insufficient and untimely funding, lack of ecological information, unregulated tourism, and a lack of visitor facilities and an interpretation center.

**Recommendations** - Recommendations include placing the PA, along with Nambor WLS, under a single

wildlife division to facilitate joint patrolling. Additionally, it is essential to fill existing staff vacancies, improve the skills, knowledge, and facilities of the staff, ensure timely and adequate release of funds, enhance protection infrastructure and staff amenities, implement effective habitat management, execute approved eco-development committee microplans, conduct biodiversity research and monitoring, develop community-centric eco-tourism, and establish a nature interpretation center with appropriate awareness programs.

## **16. Pani-Dihing Bird WLS, Assam (2023-24):**

Located in Sivasagar district in the flood plain of river Brahmaputra, the bird sanctuary, extending to 33.93 Km<sup>2</sup>, was constituted on 10 August 1999. Situated close to Sivasagar town, the PA comprises flood plains, mainly grassland interspersed with water bodies (beels) and seasonal streams. Lying between Brahmaputra and Desang rivers, the PA attracts thousands of migratory birds and is also a breeding ground of waterfowl and fishes. An IBA, it is home to about 165 bird species, including 70 migratory species, many of them endangered and rare like Bar-Headed Goose, Breasted Parrotbill, and White-Rumped and Slender-Billed Vultures. Elephants use the area as a migratory route. Some NGOs help management in the planning and implementation of eco-development plan.

The PA is surrounded on its three sides by human habitations, experiencing tremendous biotic pressure. During the monsoon most of the area is flooded, while the area turns into a marshy or barren land during winters. The major threats include illegal fishing, poaching of migratory birds, burning of grass for cattle grazing and seasonal farming after the waters recede. The PA also suffers from threat of encroachment, inadequately trained staff, absence of an approved management plan, inadequate and untimely funding, absence of scientific planning for conservation-priority bird species, and inadequate education-awareness programmes.

**Recommendations** - Recommendations include the immediate approval of the draft management plan and the prompt filling of staff vacancies. Timely release of necessary funds is crucial, as is improving the skills, knowledge, and amenities of the staff. Mapping, verification, and consolidation of the PA are essential. Additionally, enhancements to protection and administrative infrastructure should be prioritized. Conducting periodic bird counts and long-term ecological research and monitoring is vital, along with

the development of a visitor center and associated awareness and interpretation activities.

## **17. Raimona NP, Assam (2024-25):**

An integral part of the trans-boundary India-Bhutan Manas landscape, the 422 Km<sup>2</sup> PA was notified on 9 June 2021. Situated in Kokrajhar district under the administration of the Bodoland territorial council, the PA is also a vital corridor in the Ripu Chirang ER. Surrounded by dense forests, including the Buxa TR in the west, it is famous for the Golden Langur, elephant, tiger, leopard, four types of deer, lesser cats and rare birds and butterflies. Besides the rich biodiversity, the PA has high hydrological and aesthetic values.

However, the southern buffer of the PA has old encroachments. It also suffers from absence of a management plan, shortage of staff and funds, poor connectivity, inadequate interpretation and awareness programmes, and poor protection infrastructure.

**Recommendations** - Important recommendations include the immediate preparation of a management plan and the filling of vacant posts within the PA. Permanent demarcation of the southern and western boundaries is essential, alongside providing wildlife management training for the staff. Enhancements to protection infrastructure, including improved connectivity, should be prioritized. Additionally, planning and implementing participatory eco-development activities will contribute to livelihood security and the protection of the PA. Conducting awareness programs for local communities is vital, as is the collection of old maps and records from the archives of the Working Plan Circle.

**Trend of MEE scores between first and repeat cycles**

Sl. No	PAs	First Cycle			Repeat Cycle			Trend
		Phase	MEE Score (%)	Category	Evaluation Year	MEE Score (%)	Category	
1	Pobitora WLS	2006-2009	77.3	Very Good	2018-2019	74.16	Good	▼
2	Amchang WLS	2015-2017	49.04	Fair	2020-2022	62.04	Good	▲
3	Chakrasila WLS	2017-2018	59.17	Fair	2020-2022	59.38	Fair	▲
4	Deepor Beel WLS	2015-2017	62.5	Good	2020-2022	68.75	Good	▲
5	East Karbi Anglong WLS	2017-2018	49.07	Fair	2020-2022	52.59	Fair	▲
6	Garampani WLS	2017-2018	51.85	Fair	2020-2022	50	Fair	▼
7	Sonai Rupai WLS	2015-2017	50	Fair	2020-2022	59.17	Fair	▲
8	Borail WLS	2015-2017	31.73	Poor	2022-2023	35.94	Poor	▲
9	Bherjan-Borajan-Padumoni WLS	2017-2018	62.5	Good	2022-2023	57.03	Fair	▼
10	Dibrus-Saikhowa NP	2009-2010	52.27	Fair	2022-2023	57.03	Fair	▲
11	Dihing Patkai NP	2015-2017	47.41	Fair	2022-2023	53.91	Fair	▲
12	Hollongapar Gibbon WLS	2012-2013	75	Very Good	2022-2023	64.17	Good	▼
13	Marat Longri WLS	2018-2019	34.16	Poor	2023-2024	38.71	Poor	▲
14	Nambor WLS	2018-2019	42.5	Fair	2023-2024	39.06	Poor	▼
15	Nambor-Doigrung WLS	2018-2019	48.33	Fair	2023-2024	53.13	Fair	▲
16	Pani-Dihing Bird WLS	2018-2019	31.66	Poor	2023-2024	45.31	Fair	▲
17	Raimona NP	-	-	-	2024-2025	39.06	Poor	-
18	Orang (Rajiv Gandhi) NP	2006-2009	72.70	Good	-	TR	-	-



Bihar



Gaur © Rupali Thakur



## Bihar

Bihar, located in eastern India, encompasses a geographical area of approximately 94,163 Km<sup>2</sup>. The state's forest cover is 7,532.45 Km<sup>2</sup>, which is 8% of its total area (ISFR 2023). In the first and repeat cycles of MEE, a total of 11 PAs were assessed.

### 1. Bhimbandh WLS, Bihar (2020-22):

The PA covers 680.94 Km<sup>2</sup> and is a compact, Sal-dominated region known for its hot water springs, which attract many day visitors. It was notified in 1976 and offers excellent facilities for recreational tourism, with a management plan already in place. The ESZ was notified in 2017, and illegal mining has significantly decreased. However, National Highways 74 and 80 are in close proximity.

This predominantly tribal area faces challenges due to ongoing left-wing extremism, which restricts PA staff access to certain regions. Forest roads have not been maintained since 1998, and the staff primarily consists of contractual retired personnel at the Ranger and Forester levels. With 29 villages within the PA and 67 on its periphery, there is considerable biotic pressure. Additionally, the absence of EDCs contributes to poor infrastructure, limited resources, and inadequate information dissemination regarding the PA.

**Recommendations** - Recommendations include improving physical infrastructure, particularly field-based facilities, enhancing staff mobility and communication, activating EDCs to boost local

livelihoods and promote meaningful dialogue, constructing an interpretation center to support community-based eco-tourism, and enhancing staff capacity in wildlife management, habitat and species monitoring, and participatory processes.

### 2. Gautam Buddha WLS, Bihar (2020-22):

The PA spans 138.7 Km<sup>2</sup> and features healthy Sal forests characteristic of the Chhota Nagpur plateau. Historically, it served as a hunting ground for the local princely state. The southern part of the PA connects with the Gautam Buddha WLS in Jharkhand, facilitating the movement of elephants across a vast forested landscape. Managed by the DFO Gaya, ESZ has been notified.

However, the Grand Trunk road runs through the PA, resulting in heavy dependence from local communities, both tribal and non-tribal. The PA currently lacks a management plan and suffers from inadequate physical infrastructure, training, and financial resources.

**Recommendations** - Recommendations include preparing a comprehensive management plan, improving infrastructure at the field level, enhancing

mobility and communication facilities, providing wildlife training to staff, conducting periodic population estimations of major wild animals, establishing EDCs to boost local livelihoods, and ensuring the timely release of funds.

### 3. Kaimur WLS, Bihar (2020-22):

The PA spans 1,342 Km<sup>2</sup> and is located in the heart of the Kaimur plateau. It connects with forests in Jharkhand, Chhattisgarh, and Uttar Pradesh, forming part of an extensive forested landscape within the Vindhyan range. Currently, the PA is managed by two DFOs. Although an ESZ has been notified, there is no approved management plan in place. Some funds are sourced from the District Mineral Foundation in Rohtas district, but overall funding remains inadequate.

To address staff shortages, some retired personnel have been appointed on a contract basis. The area suffers from poor physical infrastructure and lacks effective ecodevelopment programs. Despite its high potential for eco-tourism, the existing EDCs are not functional.

**Recommendations** - Recommendations include preparing a comprehensive management plan, rationalizing PA administration, improving infrastructure, mobility, and staff capacity for effective management, conducting periodic population estimations of conservation-significant species, and enhancing community participation through suitable eco-development programs.

### 4. Kanwar Jheel Bird WLS, Bihar (2020-22):

The PA is part of an extensive floodplain-wetland complex formed in the lower reaches of the Burhi Gandak river. It encompasses a water body (Jheel) and surrounding lands that aggregate ten revenue villages, covering 6,311 hectares. A committee has been established to address the rights of the villagers. This PA is home to one of the largest Oxbow lakes in the country and is managed under an annual plan informed by a report from Wetlands International-South Asia. Honorary wetland Mitras and Kanwar Suraksha Guards, selected from local communities, contribute to the protection team. However, the area faces challenges such as inadequate infrastructure and resources, and there is no proper management plan in place.

**Recommendations** - Recommendations include preparing a comprehensive management plan, enhancing waterway mobility, improving physical infrastructure and communication, developing eco-

tourism and ecodevelopment programs in collaboration with EDCs, utilizing technology to detect bird trapping nets, and improving the flow of funds.

### 5. Kusheshwarasthan WLS, Bihar (2020-22):

The PA is a seasonally flooding wetland comprising 2,921 hectares of government land and 842 hectares belonging to 14 villages. Its high avian diversity led to its notification in 1994, initially for five years. However, the extent of the PA is contested by villagers, who seek to restrict the sanctuary to only the permanently inundated areas. The PA is also recognized under the National Wetland Conservation and Management Programme, and a management plan is in place.

The PA's close proximity to religious sites and its honeycomb structure due to private lands complicate management efforts. Challenges include inadequate financial resources, minimal avian research, and insufficient staff training.

**Recommendations** - Recommendations include securing a proper notification for the PA, improving waterway mobility, introducing systematic patrolling, enhancing physical infrastructure in the field, rejuvenating EDCs, and paying sincere attention to effective management.

### 6. Nagi Dam Bird WLS, Bihar (2020-22):

The PA spans 191.4 hectares, encompassing the Nagi dam reservoir and four revenue villages acquired by the government for dam construction. It was ultimately notified in 2009 and declared an IBA in 2004. The PA is managed by the DFO Jamui, and women's SHGs known as Jivika Didi are involved with the area. An integrated management plan covering both the PA and the nearby Nakti Bird WLS is currently being prepared.

The area experiences dual control by the irrigation department and FDs, and boundary demarcation is still pending. It is also vulnerable to chemical contamination from surrounding agricultural activities.

**Recommendations** - Recommendations include completing the preparation of the integrated management plan, finalizing boundary demarcation, improving waterway mobility for staff, upgrading physical infrastructure, enhancing fund flow, filling existing vacancies, and rejuvenating EDCs.

### 7. Nakti Dam Bird WLS, Bihar (2020-22):

The PA covers 322.8 hectares and includes the Nakti dam reservoir and six revenue villages acquired by the



government for dam construction. It was finally notified in 2009 and designated as an IBA in 2004. The PA is managed by the DFO Jamui and operates under dual control of the irrigation and FDs. It offers good opportunities for eco-tourism, and women's SHGs known as Jivika Didi are involved with the area. An integrated management plan covering both this PA and the nearby Nagi Bird WLS is currently being prepared.

Completing the preparation of the integrated management plan, improving waterway mobility for staff, enhancing physical infrastructure, increasing fund flow, filling existing vacancies, rejuvenating EDCs, and developing a participatory eco-tourism program.

## **8. Vikramshila Gangetic Dolphin WLS, Bihar (2020-22):**

The PA covering 50 Km<sup>2</sup> area, is the only one in the country dedicated to the conservation of dolphins and

plays a vital role in protecting the riverine ecosystem of the fluctuating Ganga river. At the time of its notification in 1991, the river length was 50 Km, but it has since increased to 63 Km. A management plan is in place, and a team of Dolphin Mitra is dedicated to protection and outreach functions. Additionally, there is a rescue center for the Great Adjutant Stork and turtles located in Bhagalpur.

However, the PA faces challenges, including inadequate infrastructure facilities at the beat and sub-beat levels and threats from municipal waste in Bhagalpur. The staff consists mainly of temporary retired personnel on a contract basis, and approximately 100 villages on either side of the river utilize the PA for various purposes.

**Recommendations** - Recommendations include improving physical infrastructure, increasing human and financial resources, enhancing waterway mobility and communication networks, engaging EDCs in eco-



tourism efforts, and upgrading the existing nature interpretation center.

### 9. Barela Jheel Salim Ali Bird WLS, Bihar (2022-23):

Representing the Lower Gangetic Plains, the PA covers 197.91 hectares of a large eutrophic, seasonally flooded marsh (chaur) that spans 1,625.34 hectares. It was notified as a PA in 1997 and is fed by the Noon River and floodwaters from the Ganga river. The PA comprises 21 discontinuous patches, ranging in size from 0.073 hectares to 47.5 hectares, and is recognized as a Wetland of National Importance due to its significant hydrological value and rich diversity of resident and migratory birds, as well as wild aquatic life. An ESZ surrounding the PA was notified in 2016. Local communities regard the entire wetland as sacred and rely on it for fishing, fodder collection, and water.

Challenges include a lack of consolidated boundaries,

excessive biotic pressure from surrounding villages, degradation of water quality from agricultural runoff, clogging of feeder channels, shrinkage of wetland area, weed infestation, poor protection infrastructure, poaching of migratory birds, inadequate tourism facilities, and the proximity of poultry farms posing disease threats.

**Recommendations** - Recommendations include taking appropriate legal action to protect the entire 1,625.34-hectare wetland under a conservation network, maintaining feeder channels and water levels in the wetland, improving protection infrastructure to prevent poaching, systematically removing invasive species such as *Eichhornia*, *Ipomea*, and *Phragmites* to maintain about 70% open water bodies and proper nesting cover for birds, establishing EDCs for assisting PA management and promoting community-based eco-tourism, incentivizing livelihood opportunities, planting local trees, and preparing a zonal master plan for the ESZ.

### 10. Pant (Rajgir) WLS, Bihar (2022-23):

Encircled by the famous five hills of Rajgir, the PA spans 35.84 Km<sup>2</sup> and falls under the Nalanda forest division. It was initially notified in 1988, with the final notification issued in 2010. An ESZ of 29.45 Km<sup>2</sup> surrounding the PA was notified in 2017. This area represents a remnant patch of forests in the Lower Gangetic Plains, providing significant hydrological value and habitat for several threatened and endangered species of plants and animals. The PA is a globally recognized cultural and religious heritage site, featuring archaeological shrines, monuments, and relics that attract many visitors, alongside attractions like the eco-park, Rajgir zoo and Nature Safari, and Ghorakatora lake.

However, the PA is surrounded by 23 villages, their agricultural lands, and associated markets, with villagers relying on the PA for livestock grazing, firewood, NTFPs, and marginal employment. The area faces challenges such as ecological isolation, a severe staff shortage, water scarcity during the summer months, inadequate ecological research and monitoring, annual fires, high tourism pressure, and occasional HWCs. Approximately 200 e-rickshaws operate to transport tourists to various sites within the PA.

**Recommendations** - Recommendations include consolidating the PA boundary by erecting pillars or cairns along its periphery, enhancing protection infrastructure, and developing part of Ghorakatora lake into a natural habitat for migratory birds. Additionally,



Pied bush chat © Vivek Sarkar

local NGOs should be involved in cultivating native tree vegetation in the ESZ, and management efforts for grasslands and wetlands should be improved to support populations of Blackbuck and migratory birds, respectively. Maintaining about 10 snags or downed logs per hectare in and around wetlands is recommended, as well as improving water management and fire protection measures. Regular vaccinations of domestic cattle should be conducted, and e-rickshaw drivers and local communities should be engaged in building eco-tourism initiatives. The high footfall of tourists should be leveraged to promote nature education and awareness, and a 'Rajgir Foundation' should be established to utilize tourism revenue for conservation and livelihood improvement.

### 11. Udaipur WLS, Bihar (2022-23):

The PA is a unique geomorphological forest-wetland unit that encompasses mixed deciduous forests and a remnant of an Oxbow lake, extending over 887 hectares, including 319 hectares of the lake. Initially notified in 1978 and finalized in 2010, the PA is connected to the river Gandak via the Nakhi feeder canal. This wetland serves as an important habitat for birds, fish, and native aquatic vegetation, while the surrounding forests provide critical habitats for several terrestrial plants and animals of conservation significance. An ESZ was notified around the PA in 2017, and it is a popular destination for students and bird watchers. EDCs play a role in supporting PA management, and most recommendations from the previous MEE have been implemented.

However, the PA is surrounded by villages that exert resource extraction pressure, leading to issues such as poaching of birds and illegal fishing. Additional challenges include ecological isolation, water quality deterioration, weed infestation, eutrophication of the lake, poor protection infrastructure, inadequately trained staff, insufficient financial resources, and a lack of publicity and education programs.

**Recommendations** - Recommendations include ensuring proper recharge and flushing of the wetland through regular maintenance of water supply and draining stagnant water, systematically removing invasive species like *Eichhornia*, *Ipomea*, and *Phragmites* to maintain about 70% open water bodies and suitable nesting cover for birds. Improving protection infrastructure is essential to prevent poaching, while maintaining about 10 snags or downed logs per hectare in and around wetlands will support biodiversity. Establishing EDCs to assist in protection, habitat management, and community-based eco-tourism can incentivize livelihood opportunities for local residents. Additionally, developing the site as an informative bird-watching location, planting local trees, and preparing a zonal master plan for the ESZ are recommended steps for enhancing conservation efforts.

**Trend of MEE scores between first and repeat cycles**

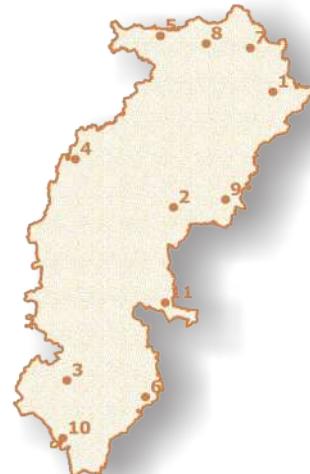
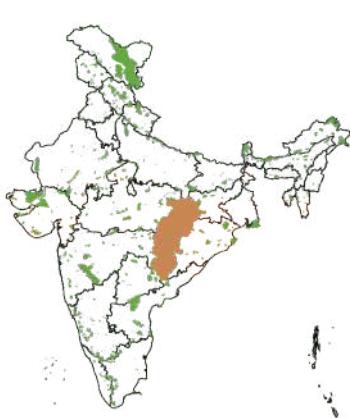
Sl. No	PAs	First Cycle			Repeat Cycle			Trend
		Phase	MEE Score (%)	Category	Evaluation Year	MEE Score (%)	Category	
1	Bhimbandh WLS	2017-2018	69.17	Good	2020-2022	61.72	Good	▼
2	Gautam Buddha WLS	2015-2017	35	Poor	2020-2022	54.69	Fair	▲
3	Kaimur WLS	2006-2009	42.4	Fair	2020-2022	61.72	Good	▲
4	Kanwar Jheel Bird WLS	2009-2010	41.67	Fair	2020-2022	44.53	Fair	▲
5	Kusheshwarasthan Bird WLS	2015-2017	27.5	Poor	2020-2022	53.13	Fair	▲
6	Nagi Dam WLS	2017-2018	42.5	Fair	2020-2022	59.38	Fair	▲
7	Nakti Dam WLS	2012-2013	33.33	Poor	2020-2022	55.47	Fair	▲
8	Vikramshila Gangetic Dolphin WLS	2012-2013	37.5	Poor	2020-2022	57.03	Fair	▲
9	Barela Jheel Salim Ali Bird WLS	2017-2018	65	Good	2022-2023	60.16	Good	▼
10	Pant (Rajgir) WLS	2018-2019	68.75	Good	2022-2023	72.66	Good	▲
11	Udaipur WLS	2018-2019	63.39	Good	2022-2023	65.63	Good	▲



Chhattisgarh



Nilgai © Azam Khan



# Chhattisgarh

Chhattisgarh, located in eastern India, encompasses a geographical area of approximately 135,192 Km<sup>2</sup>. The state's forest cover is 55,811.75 Km<sup>2</sup>, which is 41.28% of its total area (ISFR 2023). In the first cycle of MEE, a total of 11 PAs are assessed. However, in the repeat cycle, 9 PAs are assessed, and 2 PAs are excluded—1 is excluded as it is part of a TR which undergoes a separate MEE assessment, and another is excluded as it is affected by left-wing extremism.

## 1. Badalkhol WLS, Chhattisgarh (2020-22):

The PA spans 104.45 Km<sup>2</sup> and is an ecological subset within the Guru Ghasidas-Palamau-Lawalong tiger landscape, forming part of the Badalkhol-Samorost-Tamor Pingla ER. It was notified in 1975. However, corridor linkages are tenuous, and the area is affected by left-wing extremism. An ESZ has been notified, and residents' rights have been settled under the Forest Rights Act 2006 (FRA), although the relocation of four tribal villages within the PA is still pending.

The PA currently lacks an approved management plan and is facing challenges, including 35 hectares reported under encroachment, heavy biotic pressure, significant HWC, delayed compensation payments, minimal protection infrastructure, staff vacancies, and a lack of livelihood support programs. This is despite the presence of 13 Forest Protection Committees, and it also suffers from inadequate outreach, eco-tourism, and research-monitoring programs.

**Recommendations** - Recommendations include updating the draft management plan and securing its approval, filling staff vacancies, improving protection infrastructure, relocating the four villages, utilizing

technology to monitor elephant movement, realigning forest roads for effective patrolling, establishing EDCs, and operationalizing participatory management to support the livelihoods of dependent villagers. Additionally, action should be taken to address other existing weaknesses.

## 2. Barnawapara WLS, Chhattisgarh (2020-22):

The PA extends over 244.66 Km<sup>2</sup> and possesses considerable demonstrative value. It is connected to National Highway (NH) 6 to Nagpur via State Highway 14, which runs through the PA. The PA was notified in 1976. The area has patchy contiguity with Gomarda WLS and has attempted rewilding of Blackbuck and Wild Buffaloes in enclosures of 4 hectares and 10 hectares, respectively. The Kothari range serves as a 'micro elephant-core' to retain elephant populations. Teak plantations cover 21% of the PA, and it has an approved management plan supported by academic institutions and NGOs. The PA features a well-designed interpretation center, offers vehicular rides for tourists, and maintains a positive presence on social media. Three villages have been relocated, and forest rights

have been settled for all residents within the PA. No poaching has been reported, and nearly all recommendations from the previous MEE have been implemented.

Despite these strengths, heavy biotic pressure arises from the remaining villages. Additionally, there is a gold mining proposal by Vedanta located about 3 km from the PA. The EDCs are at a nascent stage, with limited livelihood support for villagers.

**Recommendations** - Recommendations include relocating the remaining 19 villages, implementing wildlife safeguards along highways, initiating an ecodevelopment program, improving mobility and communication, enhancing protection infrastructure, seeking a veterinary doctor on deputation, and exploring the possibility of introducing tigers into the PA.

### 3. Bhairamgarh WLS, Chhattisgarh (2020-22):

The PA covers 138.99 Km<sup>2</sup> and is part of the Indravati tiger landscape, which includes the Indravati river catchment, as well as Indravati TR and Pamed WLS. It connects to other TRs, such as Kawal, Kanha, and Tadoba, through RFs in Telangana, Madhya Pradesh, and Maharashtra. There is a proposal to designate the PA as a buffer area for the Indravati TR, which is currently under consideration. The PA is managed by the Deputy Director of Indravati TR.

However, there is no approved management plan in place, and while an ESZ has been proposed, it has not yet been approved. The PA faces challenges associated with left-wing extremism, with 15 villages located within it that have unresolved rights and heavy dependence on the area's resources. Forest rights for enclaved villages remain unsettled. Additionally, three groups of Wild Buffaloes introduced in the past succumbed to diseases. Management issues include staff shortages, inadequate wildlife training, poor physical infrastructure and communication, financial inadequacies, delays in fund arrival, ongoing left-wing extremism, and insufficient dialogue with local communities.

**Recommendations** - Recommendations include obtaining approval for a management plan, getting the ESZ notified, settling the rights of enclaved villagers, creating scientific baseline information on the PA's values, improving PA-people relations through livelihood-supporting ecodevelopment programs, and enhancing the protection network.

### 4. Bhoramdev WLS, Chhattisgarh (2020-22):

The PA extends over 321.44 Km<sup>2</sup> and is managed by the territorial DFO. It is located in the Kanha-Achanakmar corridor, a globally recognized tiger landscape, and was notified as Bhoramdev Sanctuary in 2001. This PA serves as a critical dispersal corridor for tigers and Gaurs and acts as an extended habitat for Kanha, connecting to it in the west. It also includes the catchment of two reservoirs and is the source of many tributaries of the Mahanadi river, making it a promising eco-tourism site.

However, the approval of the management plan and ESZ is still pending. There are 22 villages situated within the PA, which have a very high dependence on its resources. The relocation of 13 villages from the core area remains unresolved. The management of the PA is adversely impacted by high staff vacancies, inadequate protection infrastructure, and insufficient mobility and training for staff. Additionally, NH 12 A intersects the PA, and seasonal works suffer due to late fund arrivals. Certain areas within the PA are also affected by left-wing extremism. Currently, there are only six self-help groups of women that are not very active.

**Recommendations** - Recommendations include taking action to obtain approval for the management plan and ESZ, improving staff strength and physical infrastructure, enhancing mobility, communication, and capacity in scientific monitoring and participatory resource management. Steps should also be taken to shift the 13 villages from the core area, initiate eco-tourism programs such as jungle safaris and other income-generating activities focusing on local communities, enhance NH patrolling, and install high-tech barriers and appropriate signage.

### 5. Guru Ghasidas (Sanjay) NP, Chhattisgarh (2020-22):

The PA spans 1,440.75 Km<sup>2</sup> and was formerly part of the Sanjay Dhubri TR in Madhya Pradesh, known as the last home of the Cheetah. It serves as the catchment for several rivers that connect to the Ganga drainage system to the north. Recently, the PA, along with Tamor Pingla and Semorsat WLSs, has been designated as a TR. It links with the Sanjay Dhubri TR, creating a corridor to Bandhavgarh TR, thus forming a larger tiger landscape. Additionally, the PA offers good nesting sites for endangered vulture species, and the relocation of six enclaved villages is currently underway. The Van Prabandh Samiti is active, with 200 camera traps deployed and high-tech barriers



equipped with CCTVs installed on public roads, along with 11 vehicles and two wireless towers to enhance protection.

However, the management plan prepared for the period 2010-2019 has not yet been approved. The PA lacks a dedicated website, interpretation center, and adequate tourism facilities, despite its potential for tourism. There are 35 villages within the PA, along with a significant number on its periphery, leading to considerable biotic pressure and limited opportunities for community participation.

**Recommendations** - Recommendations include updating the management plan and obtaining its approval, relocating the six identified villages from the core area, developing eco-tourism initiatives given the proximity of coal mine townships, improving physical infrastructure and staff capacity, enhancing staff mobility and communication, securing a veterinary doctor on deputation, and reviving eco-development

programs that focus on improving local livelihoods.

#### **6. Kanger Valley NP, Chhattisgarh (2020-22):**

The NP extends over 200 Km<sup>2</sup> and is situated at the ecotone of Sal (southern limit) and Teak (northern limit). It was notified in 1982 and showcases some of the best virgin forests in peninsular India, exhibiting high floral diversity. The Kanger river flows through the center of the PA, which is famous for its subterranean geomorphological limestone caves. Although the NP has been proposed as a Biosphere Reserve, its ecological contiguity remains tenuous. There is no management plan in place, although an ESZ has been notified over 166 Km<sup>2</sup>. The park features good murram roads and attracts 150,000 visitors annually, with the main entry via National Highway 221. Vikas Nidhi is utilized for eco-tourism purposes. There is only one village within the PA, with rights settled under the FRA, and the staff is relatively young with a strong social



*Mugger (Adult) © Javed Anwar*

media presence.

However, the PA is surrounded by 47 villages that exert significant biotic pressure. Traditional hunting methods, such as 'Pharad' hunting and red ant eating (chapda), persist among local tribal communities. The presence of ungulates is poor, and parts of the PA experience left-wing extremism. Additionally, 353 hectares are under encroachment, with many cases pending in court. Forest management committees established in the past are not very active, although recommendations made by the previous MEE team have been met.

**Recommendations** - Recommendations include preparing a comprehensive management plan, improving protection infrastructure, exploring the reintroduction of Sambar, augmenting visitor facilities, enhancing the scientific information base and veterinary services, establishing dialogue with tribal communities through livelihood-generating eco-

development programs, and considering providing goats to tribal families to reduce reliance on traditional hunting.

### **7. Semarsot WLS, Chhattisgarh (2020-22):**

The PA is part of the Guru Ghasidas landscape over the Chhota Nagpur plateau, extending from Bandhavgarh to Palamau TRs. It serves as an important dispersal area for tigers and a movement corridor for elephants, although it has low prey densities. The coal-bearing fault of the Damodar valley runs through the central part of the PA. The current management plan has expired in 2023, and a complaint register is maintained. The PA receives about 3,000 visitors annually.

It is surrounded by 51 villages within the PA and 43 on the periphery, leading to heavy grazing and fuelwood collection. NH 143 bisects the PA, and the area has been experiencing left-wing extremism since 2001. Challenges include poor protection infrastructure and mobility, a dysfunctional wireless network due to left-wing extremism, and a staff vacancy rate of 33%. A WhatsApp group has been created to facilitate communication between staff and villagers, while WTI and a local NGO, Image, are involved in various studies. Outreach and information dissemination are poor, and S E Coalfield Limited has plans to mine coal within the corridor, about 40 km from the PA.

**Recommendations** - Recommendations include preparing a new management plan, enhancing protection infrastructure, improving staff amenities and communication, energizing ecodevelopment programs, upgrading visitor facilities to showcase Gaur Udyaan, implementing speed regulations on highways passing through the PA, and improving veterinary services.

### **8. Tamor- Pingla WLS, Chhattisgarh (2020-22):**

The PA spans 1,143.34 Km<sup>2</sup> and is part of the Sarguja-Jaspur ER. Together with Semarsot WLS and Guru Ghasidas NP, it forms a large tiger landscape that links Bandhavgarh to Palamau and has been declared the 53rd TR and the 4th in Chhattisgarh. The PA serves as an important catchment for three rivers, including the Rihand. Nallah rejuvenation efforts have been initiated using the CLAT app at micro-watershed levels, with associations involving the WII, WTI, and the local NGO Image. It is also part of the All India Tiger Estimation area, with a 362 Km<sup>2</sup> wide ESZ notified. There has been no diversion of forests, though the area features a fragmented and tenuous corridor. A WhatsApp group



Black Francolin © Vivek Sarkar

has been created to facilitate communication between local communities and staff.

Within the PA, there are eight enclaved villages, of which four have been identified for relocation. On average, 125 illicit felling cases are reported each year, indicating significant biotic pressure. Issues such as snaring, lopping, collection of Mahua and Tendu, and fires are prevalent. The area is transitioning back to normalcy from left-wing extremism. There are approximately 40 resident elephants and 100 migrating elephants, resulting in severe human-elephant conflict.

**Recommendations** - Recommendations include updating and approving the management plan, improving physical infrastructure, increasing staff strength and capacity, enhancing staff mobility and communication, initiating eco-tourism and interpretation programs, relocating the four identified villages, establishing a Kumki squad, and reviving ecodevelopment programs focused on improving local livelihoods.

## 9. Sarangarh-Gomardha WLS, Chhattisgarh (2023-24):

The PA, originally part of a hunting reserve from the pre-independence princely state, was initially notified in 1975 and officially recognized on April 12, 1983, covering 277.82 Km<sup>2</sup>. It is currently administered under two game ranges of the territorial division. The WLS boasts rich biodiversity, with a forested landscape that hosts mammals such as elephants, leopards, Gaurs, Sambar, Chitals, Sloth Bears, and tigers. The PA

features a broad altitudinal range and diverse topography, including meadows and grasslands interspersed among mixed deciduous forests, making it an attractive destination for visitors. Management has fostered good inter-departmental cooperation to mitigate HWC and has developed a promising participatory eco-tourism program.

However, the PA is home to 13 villages and is surrounded by 28 more, leading to high biotic pressure due to local subsistence dependence. Additionally, the PA suffers from the absence of an approved management plan, inadequate ecological research and monitoring, potential habitat fragmentation from highway upgrades, and insufficient support from external agencies.

**Recommendations** - Recommendations include the immediate approval of the draft management plan, conducting studies on emerging management issues like human-elephant conflict, tiger corridor management, and wildlife safety measures on highways. Additionally, there should be scientific research on biodiversity conservation and monitoring of populations, improvements in the skills, knowledge, and amenities of the staff, a socio-economic survey of the 28 neighboring villages, and enhancements to existing participatory eco-tourism and awareness programs.

## 10. Pamed Wild Buffalo WLS, Chhattisgarh (2023-24):

The PA could not be evaluated due to presence of left-wing extremist in the area, despite repeated request

from the MEE Chairman. The Government of India, vide its notification F. No. 11-1801 516812014 L.W.E., Ministry of Home Affairs Left Wing Extremism Division, dated 19 June 2021 have classified 21 districts in eight

states of India as 'Most Affected LWE Districts', and Dantewada district, in which Pamed Sanctuary is located, is one of them.

***Trend of MEE scores between first and repeat cycles***

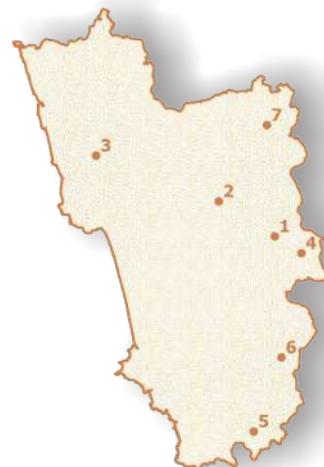
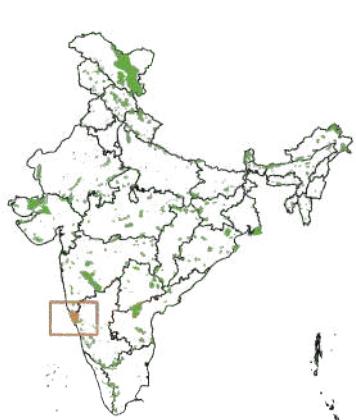
Sl. No	PAs	First Cycle			Repeat Cycle			Trend
		Phase	MEE Score (%)	Category	Evaluation Year	MEE Score (%)	Category	
1	Badalkhol WLS	2015-2017	60	Good	2020-2022	55.47	Fair	▼
2	Barnawapara WLS	2009-2010	65.63	Good	2020-2022	76.56	Very Good	▲
3	Bhairamgarh WLS	2015-2017	53.33	Fair	2020-2022	54.69	Fair	▲
4	Bhoramdev WLS	2015-2017	68.33	Good	2020-2022	58.59	Fair	▼
5	Guru Ghasidas (Sanjay) NP	2009-2010	56.06	Fair	2020-2022	60.16	Good	▲
6	Kanger Valley NP	2012-2013	78.33	Very Good	2020-2022	71.09	Good	▼
7	Semarsot WLS	2006-2009	50	Fair	2020-2022	53.91	Fair	▲
8	Tamor Pingla WLS	2015-2017	59.17	Fair	2020-2022	59.38	Fair	▲
9	Saranggarh-Gomardha WLS	2018-2019	66.67	Good	2023-2024	70.31	Good	▲
10	Pamed Wild Buffalo WLS	2018-2019	40	Fair	2023-2024	Affected with Left wing extremism	-	-
11	Udanti WLS	2006-2009	52.3	Fair	-	TR	-	-



Goh



Lesser whistling ducks © Vivek Sarkar



## Goa

Goa located in the southern India with a total area of 3,702 Km<sup>2</sup> The state's forest cover is 2,265.72 Km<sup>2</sup>, which is 61.20% of its total area (ISFR 2023). In the first and repeat cycles of MEE, 7 PAs were assessed.

### 1. Bhagwan Mahavir WLS & NP, Goa (2020-22):

The PA established in 1978, consists of a NP covering 107 Km<sup>2</sup> and a WLS encompassing 133 Km<sup>2</sup>. The NP was previously part of Mollem WLS and serves as a corridor between Goa, Maharashtra, and Karnataka, with the Mandovi river flowing through the catchment. National Highway 4A and a railway line pass through the area, while the Dudhsagar waterfall attracts thousands of visitors. Connected through RFs and alongside Kali TR, the PA is part of a 2,000 Km<sup>2</sup> forested landscape, representing an important tiger dispersal area. Bhagwan Mahaveer and Mollem NPs are interconnected, with Mollem situated at the center.

The 15 Km road from Collem to Dudhsagar waterfall runs through the PA to transport tourists. The WLS is fragmented into two parts, with a gap of about 30 Km between them. The land rights of villages located within the area have not been settled, and the region suffers from an inadequate number of staff, many of whom are not specifically trained in wildlife management.

**Recommendations** - Recommendations include

rationalizing the areas between the NP and WLS while appropriately allocating staff, rationalizing and demarcating boundaries, filling staff vacancies, providing wildlife training, and implementing crowd control measures at Dudhsagar waterfall.

### 2. Bondla WLS, Goa (2020-22):

The PA spans 7.98 Km<sup>2</sup> and is part of the larger Western Ghats landscape. It was established in 1969. It connects with Bhagwan Mahaveer WLS and Mollem NP through a corridor in the north Goa forest division, with Bondla zoo located at its center. Originally designated as a game sanctuary, the area was re-notified in 2003. Ridge habitats acting as corridors have been notified under Section 38 (O) of the Wildlife Protection Act, 1972. A draft management plan is in place, along with good visitor facilities, including a well-equipped information center; however, participatory programs, including eco-tourism, are currently absent.

**Recommendations** - Recommendations include obtaining approval for the management plan, rationalizing tourism and core zones while providing corridor management prescriptions, enhancing stakeholder participation, promoting eco-tourism, and seeking the support of scientific institutions and NGOs

for biodiversity assessment and nature education.

### 3. Dr. Salim Ali Bird (Chorao) WLS, Goa (2020-22):

The PA is very small, at only 1.78 Km<sup>2</sup>, and is located near Panaji city. It was notified in 1988 over paddy fields that were abandoned due to sea water intrusion, which facilitated mangrove formation that subsequently attracted various bird species. However, mining depositions are increasing the extent of mangroves, adversely impacting agriculture in the surrounding area. The PA experiences high visitation, but it does not currently have an approved management plan.

**Recommendations** - Recommendations include finalizing the management plan and obtaining support from scientific institutions and NGOs to build an information base, improve monitoring, and enhance nature education initiatives.

### 4. Mollem NP, Goa (2020-22):

Mollem NP, located in Goa, covers 107 Km<sup>2</sup> and acts as an ecological corridor within the Western Ghats. Notified in 1978, it connects to the Bhagwan Mahaveer WLS, facilitating vital movement for tiger and elephant populations. The park is rich in biodiversity and serves as an essential habitat for various endangered species, supported by well-developed infrastructure and timely financial allocations.

However, the park faces significant challenges, such as the absence of clear boundary demarcation with Bhagwan Mahaveer WLS, unresolved land rights issues, staff shortages, and a lack of trained wildlife management personnel. The presence of railway tracks and roads within the park also poses threats to wildlife by enabling illegal tourist access.

**Recommendations** - Immediate action should be taken to mark and map the boundaries of Mollem NP. Establish separate management structures for Mollem NP and Bhagwan Mahaveer WLS, along with distinct staff allocations. Promptly relocate villagers residing near the NP's boundaries. Implement immediate training programs for frontline staff in wildlife management. Collaborate with organizations like WII, Zoological Survey of India, Botanical Survey of India, and World Wide Fund for comprehensive biodiversity assessments. Involve local universities and colleges in assessing the park's faunal and floral resources. Initiate measures to mitigate anticipated climate change impacts. Revisit and update the management plan to include necessary management actions. Foster coordination with neighboring states for improved

conservation efforts. Explore limiting road access through the park and utilize the railway for tourism to Dudhsagar waterfall.

### 5. Cotigao WLS, Goa (2022-23):

The PA is located in the South Goa district and was established in 1968. It spans 86 Km<sup>2</sup>. It features a well-designed eco-tourism complex with excellent visitor amenities, including a butterfly park, an interpretation center, a tree-top hut, and nature trails. The evergreen, semi-evergreen, and moist deciduous forests within the PA provide critical habitats for several endemic, endangered, and threatened species of the Western Ghats. The management also protects three turtle nesting sites outside the PA. Its coastal location with dense forests attracts numerous national and international tourists, and local communities generally support conservation efforts, with reports of a Black Panther in the area.

Challenges facing the PA include a low density of herbivores, inadequate ecological information on its flora and fauna, poor road connectivity, insufficient frontline staff, a porous interstate boundary, and *Eupatorium* infestation.

**Recommendations** - Recommendations include improving habitat management, particularly of grasslands, increasing the water holding capacity of the PA, conducting ecological studies on threatened and endangered species and their habitats, enhancing displays and signage along nature trails, expanding tourist facilities, and improving interpretation and education programs. Additionally, old rubber plantations should be removed from grasslands, staff numbers and capacities need to be increased, and publicizing the PA through social media and at airports and other strategic locations is recommended.

### 6. Netravali WLS, Goa (2022-23):

Located in south-eastern Goa, the PA notified in 1999, extends to 211 Km<sup>2</sup> and serves as a vital corridor within the Western Ghats, connecting Cotigaon WLS to the south, Kali TR to the east, and Bhagwan Mahavir WLS to the north. This high-rainfall area features numerous streams feeding the Juari river and is home to two all-season waterfalls, including Palli waterfall, which is a major water source for nearby villages. The PA's diverse habitats, including montane grasslands, evergreen and semi-evergreen forests, and *Myristica* swamps, support a rich array of native flora and fauna. It has a robust protection network with staff trained in habitat and wildlife monitoring, and an ESZ has been notified.

Weaknesses of the PA include porous boundaries and



unauthorized firewood collection, insufficient fire protection measures, inadequate road connectivity and mobility in hill areas, lack of staff housing, a small core zone, HWC in agricultural areas, and the presence of a 40 Km<sup>2</sup> private enclave within the PA.

**Recommendations** - Recommendations include improving staff numbers and deployment, especially in hilly areas, establishing APCs and watch towers at strategic locations, enhancing participatory eco-tourism, and developing grasslands, particularly in former rubber plantation areas. Additionally, it is important to acquire the Salavali grassland from the water resource department, increase inter-state meetings for better protection, relocate Juna village outside the PA, and resolve the legal status of the private enclave to incorporate it into the PA. Funding should be improved for HWC management, weed removal, grassland management, participatory eco-tourism, and village relocation, with a focus on protecting the unique *Myristica* swamp habitat.

### 7. Madei WLS, Goa (2023-24):

Located in the Western Ghats, the PA covers 208.48 Km<sup>2</sup> and was notified on May 31, 1999. It is currently managed as a wildlife wange, Maloli, and is contiguous with PAs in Karnataka to the northeast and with Bhagwan Mahaveer WLS and NP to the south, forming an important conservation unit. The PA is rich in biodiversity, hosting around 1,000 species of flowering plants, including several rare and endemic Orchids. Notable wildlife includes the Indian Gaur, the state animal of Goa, along with Sloth Bears, Mongooses, Wild Dogs, Slender Loris, tigers, and leopards. The area also serves as a catchment for the river Mandovi and is home to several Sacred Groves and rare amphibians, highlighting its conservation significance. The diverse landscape, featuring dense forests and waterfalls, offers high potential for eco-tourism. Additionally, the PA has a well-established protection infrastructure with adequately trained staff.



Indian golden-backed frog © Niket Alashi

However, the PA faces excessive biotic pressure from 32 villages partially or completely within its boundaries, where residents heavily depend on its resources due to unresolved rights regarding their agricultural fields and cash crop plantations. The area lacks an approved management plan, experiences staff vacancies, suffers from conflicts related to crop raiding by herbivores, ongoing encroachments, and irregular funding.

**Recommendations-** Recommendations include obtaining approval for the draft management plan, settling the rights of villagers, surveying and demarcating PA boundaries, mapping wildlife corridors, filling staff vacancies, providing appropriate staff training, conducting regular population estimations of critical species, expanding ecological research and monitoring, strengthening ecodevelopment programs with a focus on participatory eco-tourism, upgrading the interpretation center and outreach activities, improving habitat management programs, and relocating the division Headquarter from Panaji to Ponda.

**Trend of MEE scores between first and repeat cycles**

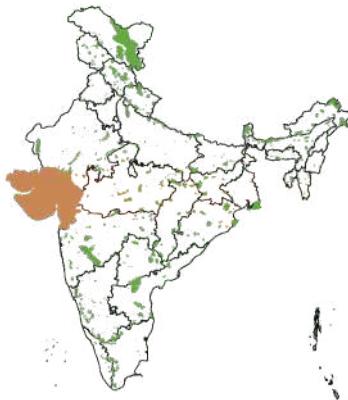
Sl. No	PAs	First Cycle			Repeat Cycle			Trend
		Phase	MEE Score (%)	Category	Evaluation Year	MEE Score (%)	Category	
1	Bhagwan Mahavir WLS & NP	2012-2013	70	Good	2020-2022	57.03	Fair	▼
2	Bondla WLS	2012-2013	68.33	Good	2020-2022	58.62	Fair	▼
3	Dr. Salim Ali Bird (Chorao) WLS	2017-2018	85.83	Very Good	2020-2022	73.44	Good	▼
4	Mollem NP	2006-2009	81.1	Very Good	2020-2022	58.59	Fair	▼
5	Cotigao WLS	2015-2017	70.83	Good	2022-2023	78.13	Very Good	▲
6	Netravali WLS	2009-2010	59.38	Fair	2022-2023	70.31	Good	▲
7	Madei WLS	2018-2019	50	Fair	2023-2024	59.38	Fair	▲



Gujarat

Lesser Flamingos © Rajdeep Mitra





# Gujarat

Gujarat located in the western India with a total area of 1,96,244 Km<sup>2</sup>. The state's forest cover is 15,016.64 Km<sup>2</sup>, which is 7.65% of its total area (ISFR 2023). In the first and repeat cycles of MEE, 25 PAs were assessed.

## 1. Barda WLS, Gujarat (2018-19):

Notified as a second home for the Asiatic Lion in 1979, the PA consists of good forests and two large and two small dams. It is free from encroachments and the field staff and Maldharis living in the nesses have mutually useful communication. The level of HWC is moderate and the PA is adequately funded.

However, the final notification has not been issued, as there are 62 nesses with a large cattle population, claiming customary resource use right in the PA. Inadequate habitat improvement and polluting cement and chemical industries near the sanctuary pose serious management challenges.

**Recommendations** - The recommendations include urgent completion of formalities to issue the final notification; improving protection infrastructure and enhancing staff knowledge, skill, equipment and amenities; incentivizing Maldharis to reduce the number of cattle and seasonal nesses; improving communication network and staff mobility; securing lion corridors to Ranavav and Alech; controlling proliferation of *Cassia tora* and *Lantana camara*; notification of the ESZ for regulating mining and quarrying in the proximate areas; regulation of

pilgrimage within the PA; and establishing captive breeding centers for lion, Spotted Deer and Sambar.

## 2. Balaram-Ambaji WLS, Gujarat (2020-22):

Balaram-Ambaji WLS notified in 1989, spans 545 Km<sup>2</sup> and is situated on the Gujarat-Rajasthan border, focusing on the conservation of the Sloth Bear. However, the sanctuary has a low herbivore population. Plans are in place to introduce Red Jungle Fowl from a captive breeding center, and Cheetal may also be released to enhance the herbivore population, with individuals sourced from Jessor Bear WLS, where 17 Cheetals are currently in an enclosure. This PA and Jessor Bear WLS are managed jointly.

While there are 86 EDCs in place, they are not very effective. Staff have received training at Gir NP, and the management plan includes provisions for landscape connectivity. A Memorandum of Understanding has been signed with a local university for research support, and veterinary assistance is available. However, visitor management remains poor, though stakeholder participation is assessed as satisfactory.

**Recommendations** - Recommendations include eradicating *Prosopis*, increasing the frequency of

habitat monitoring, training staff for chick rearing, carefully examining the reintroduction of Red Jungle Fowl and Cheetal, and involving NGOs in outreach activities.

### 3. Bansda NP, Gujarat (2020-22):

Bansda NP was notified in 1997 and is a small NP covering 24 Km<sup>2</sup>. An ESZ has been notified around the park, which features contiguous forests with the Dang forests. It is well managed despite resource constraints, and ETDC operate eco-tourism programs within the area. However, the busy Surat-Nasik highway runs through the PA, leading to road kills of wildlife. The park faces challenges due to inadequate finances, research, and monitoring, and it contains a village and two small hamlets within its boundaries.

**Recommendations** - Recommendations include taking action to realign the Surat-Nasik highway or creating safe passages for wildlife crossings, relocating human habitations from the PA, improving staff numbers and capacities as well as protection infrastructure and finances. Additionally, establishing eco-development and eco-tourism programs, and involving NGOs for outreach and research purposes should be prioritized.

### 4. Gir NP and WLS, Gujarat (2020-22):

The Gir Conservation Area (GCA) is comprised of the NP, WLS, and regional notified peripheral and coastal forests, spanning 1,412 Km<sup>2</sup>, where the population of lions has progressively increased to 660. The NP is free of Maldharis, but pressure from human activities continues in the WLS. Gir NP was notified in 1965, and Gir WLS was notified in 1981. There is a proposal to open cyclone-impacted areas of western Gir to create more suitable habitat for lions. The GCA exemplifies inter-sectoral integration, promoting the lion as a symbol of pride for Gujarat. A well-defined ESZ is in place, and there is good documentation of the GCA's values, along with adequate financial, human, and physical resources.

However, there is an urgent need for greater focus on tourism, as the current tourism infrastructure is unregulated.

**Recommendations** - Recommendations include realigning roads in tourism areas to enhance the wilderness experience, framing a policy to regulate tourism infrastructure, carefully rehabilitating cyclone-impacted areas to create suitable lion habitats, establishing expansion limits for religious sites within the PA, and engaging in efforts to find a 'second home'

for lions.

### 5. Jambughoda WLS, Gujarat (2020-22):

Jambughoda WLS, notified in 1994, extends over 130 Km<sup>2</sup>. Although many villages exist within the sanctuary, biotic pressure is under control. There are two religious sites within the PA that experience high-volume, short-duration pilgrimage seasons. The sanctuary has Eco-tourism Development Committees (ETDC) operating three centers, managing tourism with a well-developed revenue-sharing mechanism. Visitors are insured for Rs. 50 lakhs, with the premium paid by the ETDC. No cases of HWC have been reported, and a management plan is in place.

However, grazing by cattle and fire incidents often occur. The sanctuary faces challenges such as staff shortages, inadequate infrastructure and finances, and improperly deployed camera traps.

**Recommendations** - Recommendations include managing pilgrimage effectively, implementing speed controls on roads passing through the PA, involving more EDCs, improving staff numbers, training, physical infrastructure, and finances, and initiating planning at the landscape level.

### 6. Jessor Sloth Bear WLS, Gujarat (2020-22):

Jessor Sloth Bear WLS was notified in 2001 and extends to 180 Km<sup>2</sup>, covering forest areas of 18 villages that surround the PA. It is managed jointly with Balram-Ambaji WLS. Currently, there is no zone plan in place, but the sanctuary provides good veterinary care and rescue arrangements for handling stray sloths and leopards. A green corridor is planned to connect the two PAs. The ungulate presence is poor, with Nilgai being the only notable species. Captive breeding programs for Cheetal and Red Jungle Fowl have been established in enclosures.

The sanctuary faces challenges, including high growth of *Prosopis juliflora*. Although camera traps have been deployed, there is no regular data collection or study. Several EDCs have been formed, but they lack active programs.

**Recommendations** - Recommendations include appointing an independent director for both PAs (currently managed under the territorial division) with an adequate number of front-line staff, vitalizing EDCs by involving them in eco-tourism, carefully examining the introduction of Cheetal and Red Jungle Fowl, removing *Prosopis* and replacing it with fruit-bearing trees, and engaging NGOs in scientific management and participatory programs.



## 7. Kachchh (Lala) Great Indian Bustard WLS, Gujarat (2020-22):

Kachchh (Lala) Great Indian Bustard WLS, notified in 1985, is a tiny PA measuring only 2 Km<sup>2</sup>, primarily established for the conservation of the bustard species. Notably, it has been observed that more bustards are reported outside the sanctuary. An ESZ has been notified around the PA, and although there is no formal management plan, the sanctuary is well-managed according to the "Recovery Plan for Great Indian Bustards (GIB) in Kachchh, Gujarat."

The area contains many windmills, but there is currently no dedicated staff, as personnel are deployed from the territorial division. Additionally, there is a lack of stakeholder participation in management efforts.

**Recommendations** - Recommendations include exploring possibilities for expanding the PA to include more suitable habitats, posting wildlife-trained and

dedicated staff, engaging stakeholders in windmill management, improving outreach and awareness among local communities, and enhancing the availability of funds for research and monitoring activities.

## 8. Kachchh Desert WLS, Gujarat (2020-22):

The PA spans a vast 7,000 Km<sup>2</sup>, consisting of approximately 109 Km<sup>2</sup> of RF and about 1,300 Km<sup>2</sup> of revenue land, with the remainder being territorial waters. Notified in 1986, the final notification is still awaited. This PA is notable for housing the Spiny-tailed Lizard, the only herbivorous reptile, and being the sole breeding site for Greater Flamingos in India, showcasing great desert diversity. However, underground high-tension power lines are present in some areas, and the management is overseen by the territorial division rather than an independent administration. The Dholavira archaeological site and fossil park provide excellent resources for tourism and



interpretation.

Progress on earlier MEE recommendations has been minimal, and heavy grazing occurs during the monsoon season. Portions of the PA adjacent to the international border are under the control of the Border Security Force (BSF), limiting access for forest officials. The area lacks participatory programs, and education, interpretation, and research-monitoring efforts are inadequate.

**Recommendations** - Recommendations include appointing an ACF in charge of wildlife management for the landscape, settling villagers' rights, deploying dedicated staff along with financial and infrastructural resources, developing a central government-supervised joint protection strategy with the BSF, and encouraging the installation of additional underground high-tension power lines. Additionally, enhancing community participation, eco-development, and eco-tourism programs, as well as

involving NGOs in research and outreach activities, should be prioritized.

### **9. Khijadiya WLS, Gujarat (2020-22):**

Khijadiya WLS was notified in 1991 and is designated as a Ramsar site, managed as part of a range of the Marine NP. A man-made wall separates the seawater system from the freshwater system, and while there are five peripheral villages, the area experiences minimal biotic disturbance. The current management plan concluded in 2024. Notably, there has been an increase in the Black-necked Stork population, and local youth are engaged as Eco Guides. Its proximity to Jamnagar ensures a good tourist footfall, and the sanctuary features a well-demarcated tourism zone along with an ESZ. A professionally designed boardwalk with proper interpretive signage has been developed in the intertidal and mangrove habitats of the sanctuary.

However, there is a shortage of trained staff.

**Recommendations** - Recommendations include providing fencing or cattle-proof fencing along the village sides, involving local institutions and NGOs in nature education, research, and participatory management, and engaging more trained staff to enhance conservation efforts.

### **10. Marine (Gulf of Kutch) NP & WLS, Gujarat (2020-22) :**

Marine (Gulf of Kutch) NP & WLS was notified in 1980 and is collectively known as the Gulf of Kutch NP and WLS. Situated in one of the most industrialized regions of Gujarat, which includes petrochemical, fertilizer, and cement industries as well as seaports, managing this PA presents significant challenges. The management has successfully implemented mangrove and coral restoration programs funded by corporate sponsors and government support. Despite ongoing development pressures, the park's existence remains vital for protecting islands with coral reefs and mangroves in the intertidal zone, where there are substantial threats from saltpans and chemical industries. A management plan is currently in place.

While there are no villages within the PA, artisanal fishing occurs, indicating human interaction with the ecosystem. However, inadequate and untrained staff, the absence of participatory programs with the fishing community, and limited outreach initiatives undermine effective management.

**Recommendations** - Recommendations include improving dialogue with industries and integrating PA conservation provisions into their planning,



Nilgai © Ameya

developing ecodevelopment programs in collaboration with the fishing community, and taking action to provide high-value compensation for land lost to development in the ESZ.

### 11. Nal Sarovar Bird WLS, Gujarat (2020-22):

Nal Sarovar Bird WLS was notified in 1965 and spans an area of approximately 123 Km<sup>2</sup>. It is a natural wetland of brackish water connected to the Gulf of Khambhat and is recognized as a Ramsar site. Located near Ahmedabad and Gandhinagar, the sanctuary serves as an urban refuge. Originally managed by the tourism department, it was later handed over to the Forest Department. The GEER Foundation supports management in planning and monitoring efforts, and drainage areas leading to the wetland are protected, particularly during the migratory season. The sanctuary is also an IBA, attracting about 311 species of birds during winter. Joint protection efforts are undertaken by the police and FD, and a management plan is in place. There are well-trained bird guides available for visitors.

However, the sanctuary suffers from inadequate staff numbers, and the interpretation center, while well-designed and thematic, is not located in an appropriate area.

**Recommendations** - Recommendations include appointing trained staff, planting islands with suitable species, relocating the interpretation center to a more appropriate area, removing artificial perches, and developing ecodevelopment programs in the nearby

villages.

### 12. Purna WLS, Gujarat (2020-22):

Located in the Western Ghats, the PA is an integral part of a 3,000 Km<sup>2</sup> forested landscape, in conjunction with neighboring territorial divisions, including Dang. It was notified in 1990 and is entirely inhabited by tribal communities. There has been significant management improvement since the last evaluation, with active women's self-help groups (SHGs) and a management plan in place along with a notified ESZ and well-established tourism infrastructure.

However, the PA is home to 26 villages that exert enormous biotic pressure. Populations of Cheetal and Sambar have decreased over the years, and staff remain inadequately trained. Additionally, management outreach efforts are insufficient.

**Recommendations** - Recommendations include improving protection infrastructure, training staff, examining options for rewilding the area with ungulates, using fire to create grasslands, and enhancing participatory programs to help villagers understand the value of the PA and improve their livelihoods.

### 13. Shoolpaneswar (Dhumkhali) WLS, Gujarat (2020-22):

Shoolpaneswar (Dhumkhali) WLS was notified in 1982 and covers an area of more than 600 Km<sup>2</sup>. The sanctuary has an updated management plan; however, its habitat has become fragmented due to the Sardar Sarovar and Karjan dams. The area experiences heavy

biotic pressure from goats and cattle grazing, originating from over 100 villages located in the periphery. EDCs are actively involved in controlling timber smuggling, firefighting, and managing tourism. Nevertheless, large-scale encroachments and claims under FRA persist, and heavy poaching in the past has led to the extirpation of herbivores. In-situ breeding of Chausingha has been attempted, with proposals for reintroducing Barking Deer and Junglefowl.

**Recommendations** - Recommendations include improving staff strength and protection infrastructure, initiating joint patrolling efforts between staff from Madhya Pradesh and Gujarat, creating grasslands, enhancing the PA-people interface to start ecodevelopment programs aimed at reducing biotic pressures and improving livelihoods, as well as involving NGOs and local institutions in outreach activities and research monitoring.

#### 14. Velavadar (Blackbuck) NP, Gujarat (2020-22):

The PA notified in 1976, spans 34.5 Km<sup>2</sup> and is dominated by grassland and savannah habitats. A small wetland in the southern part of the PA attracts migratory birds and serves as a roosting site for harriers. The management conducts conservation-friendly activities, such as collecting eggs and chicks of Lesser Floricans from adjacent private lands and raising them within the PA. Additionally, the management supports livelihood-enhancing skill development for villagers living on the fringe of the area.

However, the staff lack necessary wildlife training, and funding is inadequate.

**Recommendations** - Recommendations include improving staff skills and knowledge in PA management and enhancing veterinary support.

#### 15. Wild Ass WLS, Gujarat (2020-22):

The PA covers 4,954 Km<sup>2</sup> and was declared in 1973, making it one of the largest WLSs in the country. It features a unique ecological setting in the Little Runn, home to exceptional bird assemblages. Designated as an IBA, the PA is the only habitat for the Wild Ass, with a population of about 6,000 individuals. It also boasts an excellent interpretation center and effective tourism management from Bajana. A management plan is in place, and the management maintains good relationships with stakeholders, who serve as informers.

However, the PA suffers from a severe shortage of staff, and the presence of salt pans causes significant

disturbances. Grazing grounds, fuelwood lots, and fishing areas for local villages have been depleted, leading to high dependence on the PA, which also contains several religious sites.

**Recommendations** - Recommendations include improving the livelihoods of local communities, demarcating grazing and fuelwood areas for villagers, reassessing the design and placement of artificial bird perches and water-retaining structures, establishing a proper entry-exit system for pilgrims, increasing the extent of grasses like Sveda, controlling weeds, enhancing staff numbers and mobility, protecting archaeologically important sites, improving coordination with district administration and line departments, and involving NGOs in outreach functions.

#### 16. Gaga (Great Indian Bustard) WLS, Gujarat (2022-23):

The PA, covering 332.87 hectares, is a small sanctuary notified in 1988 and located in two parts amid extensive wasteland. It is recognized for its rich biodiversity, hosting over 150 species of plants and animals, including endangered species such as the wolf, Houbara Bustard, Pelicans, and cranes, as well as plants like *Commiphora mukul* and *Urochondra setulosa*. A management plan is in place; however, the sanctuary is fragmented and experiences livestock grazing, with many sections of the fence designed to prevent cattle ingress in disrepair.

The sanctuary suffers from poor road conditions, inadequate stakeholder participation, insufficient protection infrastructure, and limited human and financial resources. There is an absence of population estimation, wildlife research, and monitoring, while NGOs and institutions are not actively involved. Additionally, windmills in the vicinity pose threats to wintering Flamingos, cranes, Pelicans, and ducks, and GIBs have not been sighted for over two decades.

**Recommendations** - Recommendations include planning to include the vast wasteland separating the two parts of the PA into the WLS, systematically removing *Prosopis* and developing areas with grasses and other palatable plants, increasing staff numbers, engaging with Tata Salt Works for CSR support, collaborating with scientific institutions for wildlife research and monitoring, organizing an annual winter migratory bird census, and working with relevant organizations to discourage windmills in high bird-use areas.

## 17. Girnar WLS, Gujarat (2022-23):

Girnar WLS was notified in 2008 and spans an area of 178.8 Km<sup>2</sup>. It is an isolated yet important part of the Greater Gir landscape, primarily consisting of semi-arid vegetation that secures a population of lions along with 537 plant species, 37 mammals, 38 species of herpetofauna, and 300 bird species, including the very rare King Vulture. The sanctuary has an excellent management plan in place and serves as the catchment area for the river Ozat. It features good protection infrastructure, Local Lion Trekkers, an animal rescue team, and excellent scientific support from the GEER Foundation and various NGOs. Active EDCs contribute to a successful eco-tourism and interpretation program, while the Lion Conservation Society, led by the CWLW of Gujarat, oversees the management of lion populations in the Greater Gir landscape. Recently, a lion safari has been added to the eco-tourism offerings.

However, proximate villagers continue to exercise traditional resource use rights, and the sanctuary experiences heavy footfall at religious sites. Challenges include a 50% vacancy rate in frontline staff, linear infrastructure and industrial development around the PA, a lack of information regarding the PA's capacity to support lions, and delayed release of Centrally Sponsored Scheme (CSS) funds, which weaken management efforts.

**Recommendations** - Recommendations include training villagers, temple workers, taxi drivers, and shopkeepers to improve participatory management of pilgrimages within the PA. Solar-powered pumps should be used to fill water troughs for wildlife, and appropriate signage warning of lion crossings should be placed in Junagarh city and along highways to prevent road accidents involving lions. Additionally, NGOs and local institutions should be engaged for wildlife research and monitoring, and a study on the carrying capacity of the PA concerning big cats should be conducted.

## 18. Hingolgadh WLS, Gujarat (2022-23):

The PA spans 654.07 hectares and is located in Saurashtra, having been notified in 1980. It is characterized by thorny vegetation dominated by *Acacia senegal*, which supports wildlife species such as Chinkara, Nilgai, Lesser Cats, and Rare Hyenas. A comprehensive management plan is in place, with adequate collaboration with NGOs for eco-development, education, and awareness programs. The GEER Foundation contributes to ecological

research and monitoring efforts.

The DCF is based in Gandhinagar, with only a Range Officer on deputation managing the PA. Management challenges include an acute shortage of staff, inadequately trained personnel—particularly in education and interpretation—livestock grazing, insufficient ecological monitoring, and a lack of adequate funding.

**Recommendations** - Recommendations include improving staff numbers, capacities, and deployment; expanding publicity for the PA through radio talks, social media, and publications; upgrading the existing interpretation center; discouraging the conversion of thorny forests to grasslands; taking action to declare the neighboring large grassland (veedi) as a Conservation Reserve; and providing additional funds for nature education and ecodevelopment programs.

## 19. Mitiyala WLS, Gujarat (2022-23):

Part of the erstwhile Bhavnagar state, the PA covers 18.22 Km<sup>2</sup> and was notified in 2004. It is administered as part of the East Gir division and is home to lions, along with several other regional animal species. The area is dominated by Teak and is experiencing a growing lion population. The PA management enjoys good relations with line departments and local communities, who are supportive of conservation efforts.

However, the PA contains five villages and receives relatively little attention, facing challenges such as staff shortages, inadequate budgets—particularly for HWC cases—absence of lion and leopard census figures, degraded habitat in the corridor linking Gir and Mitiyala, inadequate eco-development and eco-tourism initiatives, and reports of occasional lion shows on private lands. Additionally, there are 28 windmills in the vicinity, which pose environmental concerns.

**Recommendations** - Recommendations include preparing a site-specific management plan, protecting and maintaining patches of thorn forests that represent the original vegetation, improving protection infrastructure, manpower, and financial resources. It is also important to relocate the five villages outside the PA, take strict action against illegal lion shows on private lands, carefully examine and consult stakeholders regarding the release of wolves in the PA, initiate community-based eco-tourism, involve NGOs in scientific studies and ecological monitoring, and discourage the establishment of windmills near the PA.

## 20. Narayan Sarovar Chinkara WLS, Gujarat (2023-24):

Located in Kachchh district, the PA was initially notified in 1981 over 765.79 Km<sup>2</sup>. Following area rationalization in 1995, the currently notified area is limited to 443.60 Km<sup>2</sup>, with the final notification still pending. This mosaic of habitats includes Desert Thorn Forest, Savannah grasslands, coastal areas, mangroves, and approximately 45 inland wetlands, representing a unique arid ecosystem. It is home to species such as Chinkara, Caracal, wolf, leopard, Spiny-Tailed Lizard, Desert Cat, and several rare and endangered bird species, including the Houbara Bustard. The PA is administered by the DCF, Kachchh West Division and benefits from scientific support from the GEER Foundation and Gujarat Institute of Desert Ecology. As a major bird migration area, the PA has a low human population density and includes large revenue and uncultivated lands. There are four satellite core zones, and the ESZ surrounding the PA was notified in 2015.

However, the PA contains 32 villages with a high cattle population, alongside cattle intrusion from neighboring areas, including Rajasthan, and features two famous temples on the fringe, which increase resource extraction and pilgrimage-related pressures. The region is rich in minerals such as limestone, lignite, bentonite, and bauxite, with ongoing mining activities nearby. Rights and concessions for local people remain unsettled, and the PA faces challenges including a lack of dedicated staff, vacancies among field staff, the spread of *Prosopis*, limited community participation, and inadequate population trend analysis of endangered species.

**Recommendations** - Recommendations include urgent settlement of local rights and issuance of the final notification, boundary demarcation, scientific management of *Prosopis*, and systematic periodic assessments of Rare, Endangered and Threatened (RET) species populations with assistance from local scientific institutions. Involving local youth in habitat management, bird monitoring, and grazing control, forming EDCs for income generation and outreach functions, filling vacancies among field staff, ensuring their proper deployment, and finalizing and approving the ESZ Zonal Master Plan are also critical actions needed for effective management.

## 21. Paniya WLS, Gujarat (2023-24):

The PA, notified in 1989, covers 39.64 Km<sup>2</sup> and is administered under the Gir East Forest division. It is an integral part of the core area of the GLCA, comprising

PA, RFs, protected forests, unclassified forests, and grasslands (veedis). Located in Amreli district, the PA represents a semi-arid ecosystem within the Saurashtra region and supports a high diversity of carnivore species along with rich assemblages of flora and fauna. The PA is home to 41 mammals, 338 bird species, and 57 species of herpetofauna, making it a vital hydrological contributor to the river system of the GLCA. Managed under the composite Gir management plan, the well-demarcated PA contains only one traditional Ness (a temporary settlement of herders). It is well protected, with adequate protection infrastructure and staff amenities, and participates in research and monitoring efforts across the greater Gir landscape.

While the PA experiences limited biotic pressure from grazing and subsistence resource extraction due to the presence of the Ness. There are currently three vacancies among the four Forest Guard positions. Additionally, some ecological information on PA-specific issues is lacking.

**Recommendations** - Recommendations include filling the vacant forest guard positions, ensuring regular maintenance of windmills and solar panels for sustained power to facilitate effective communication and protection efforts, conducting periodic maintenance of forest roads, developing a PA-specific action plan, enhancing eco-development initiatives, implementing the composite ESZ, and documenting a PA-specific biodiversity inventory.

## 22. Porbandar Bird WLS, Gujarat (2023-24):

Porbandar Bird WLS was notified in 1988 and is located in Porbandar city, representing the Kathiawad peninsula of the Saurashtra region. The PA consists of a freshwater body covering 9.33 ha and serves as an important staging ground for migratory birds, alongside eight satellite lakes within a 5-km radius. These wetlands, formed from natural depressions and enhanced by human efforts, provide a mosaic of habitats for various species of plants, birds, reptiles, amphibians, insects, fish, zooplankton, and other invertebrates. The sanctuary is free from human habitations and is well demarcated, making it a key site for nature education and awareness programs, as well as a paradise for bird watchers. Local communities contribute to the protection and rescue of injured birds, notably during the annual Karuna Abhiyan event.

However, the sanctuary and its satellite wetlands are surrounded by residential buildings and industries, leading to exposure to solid, liquid, and chemical

pollution. Management weaknesses include an inadequate number of field staff, poor inter-sectoral coordination, the absence of quarantine facilities in the Bird Rescue Centre, and seasonal droughts and floods that affect water levels in the wetlands. Additionally, there is a spread of invasive species such as *Prosopis* and Water Hyacinth.

**Recommendations** - Recommendations include preparing a comprehensive management plan for the entire wetland landscape through multi-stakeholder consultations to implement participatory protection, livelihood generation, research and monitoring, and education and awareness strategies. Efforts should be made to transfer control of the wetlands from the municipal corporation to PA management, enhance eco-development efforts around the eight satellite wetlands, increase the number of field staff and funding, and pursue the notification of the Rann of Chhaya (76 ha) as a bird sanctuary to support Flamingo congregations.

### 23. Rampara Vidi WLS, Gujarat (2023-24):

The PA, covering 15 Km<sup>2</sup>, represents the dry deciduous scrub and savannah forests of the Saurashtra region and was notified in 1988. Originally a shooting reserve for the erstwhile royalty, the PA serves as a major watershed for the Machchu river and is home to 15 species of mammals, 179 birds, 15 reptiles, 50 tree species, and 40 grass species. Additionally, approximately 615 hectares abutting the PA act as an extension, while about 6,520 hectares of wasteland surround it. The PA, which has no villages inside, is recognized as the northernmost limit of the leopard in Saurashtra. It is well demarcated, equipped with good protection infrastructure, and features a Lion Captive Breeding Centre.

However, the small size of the PA leads to challenges such as illegal grazing within the area and heavy grazing in the surrounding lands. It is managed by a single RO responsible for both the PA and adjacent areas. Other management weaknesses include the absence of population estimations for key fauna, lack of a mobile squad, the spread of *Prosopis*, and a heavy workload on staff.

**Recommendations** - Recommendations include the immediate preparation of a management plan in consultation with stakeholders, scientific management of *Prosopis*, establishment of solar-powered pumps to provide water during the summer, deployment of additional Forest Guards, and engaging local youth in controlling grazing and protecting the PA.

Furthermore, participatory management of the surrounding wasteland, implementation of eco-development activities in the six nearby villages, and enhanced nature education and outreach programs should be prioritized.

### 24. Ratanmahal Sloth Bear WLS, Gujarat (2023-24):

Located at the confluence of the Vindhya mountain range and the Malwa plateau, and surrounded by forest divisions of Gujarat and MP, the PA is an important part of about 550 Km<sup>2</sup> compact forest landscape. A hunting area of the royalty in the past, the PA, extending over 55.65 Km<sup>2</sup> was notified in 1982. Final notification is pending. Consisting of flat plateau lands and undulating rugged slopes, the PA constitutes important catchment to Panam river in the east and Orsang in the south. The area harbours dry and moist deciduous forests and patches of Bamboos and dry Teak forests, and is one of the prime habitats of the Sloth Bear and the Flying Squirrel. It is supported by local scientific institutions and NGOs.

However, the presence of five revenue villages inside the sanctuary and six villages on the fringes of the sanctuary exert biotic pressures on the PA by way of grazing of large numbers of cattle, illicit wood cutting, man-made fires, NTFP collection and vulnerability to encroachment of forest land. The PA experiences periodic HWCs and has inadequate ecological database and eco-development programmes.

**Recommendations** - Important recommendations include preparation of the management plan with stakeholder consultation, improvement of water supply during summer, filling up of vacancies of field staff, improvement of protection infrastructure, strengthening of eco-development programmes for improved livelihoods and PA protection, improved nature education, eco-tourism and outreach programmes, improved inter-sectoral coordination and finalization of Zonal Master Plan for the notified ESZ.

### 25. Thol Lake WLS, Gujarat (2023-24):

The PA, located in the Mehsana district, is an important bird habitat in the Saurashtra region and consists of an old, large irrigation tank and several water ponds. The wetland receives rainwater as well as water from the Narmada canal. Extending over to 6.99 Km<sup>2</sup>, the PA was notified in 1988. Declared a Ramsar site in 2021, it provides home to about 140 species of migratory and resident birds, including the Saras crane and 92 species of water fowl. An IBA, the PA holds about 57% bird

species of Gujarat, and is one of the eight national wetlands in Gujarat. There are no villages inside and ESZ around the PA has been notified. Being close to Ahmedabad, the PA is visited by a significant number of bird watchers, students and tourists and has good publicity material, including QR code-based bird information.

There are four villages close to the PA with low impact. However, several chemical and cement industries around it are potentially pollution generator. Additionally, 13 oil wells inside the PA are controlled by ONGC. Poor staff strength, proliferation of invasives like *Prosopis*, Knot Grass and Water Hyacinth, illegal fishing

during monsoon, inadequate ecological information, and inflow of pesticide-laden water from agriculture lands are other management problems.

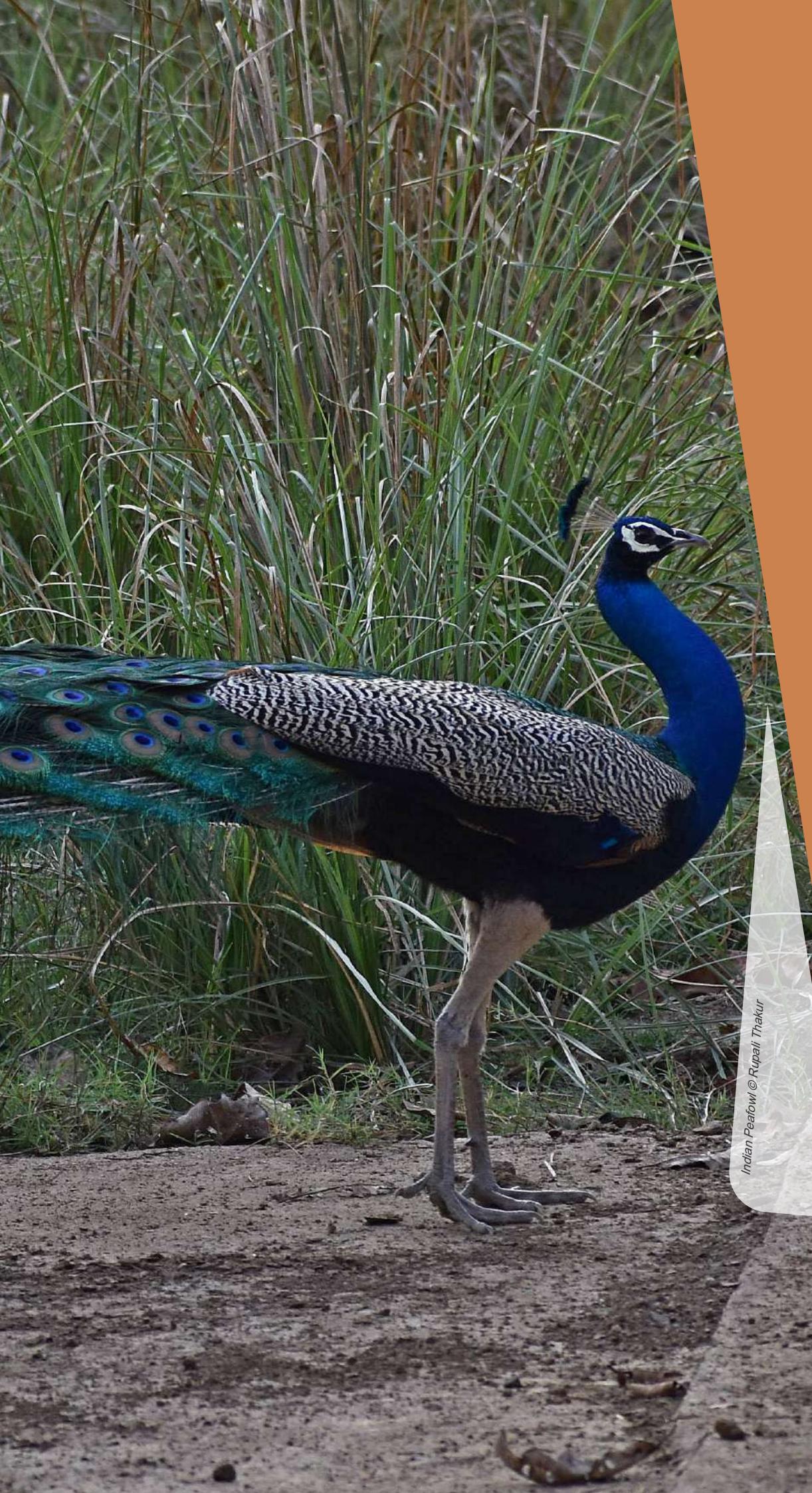
**Recommendations** - The recommendations include issuance of final notification, immediate preparation of the management plan, increase in staff strength, including creation of post of a Research Officer, four Foresters and two Forest Guards, provision of a small boat and protection gear, monitoring of water pollution, improved management of visitors, eco-development activities in the proximate four villages, and regular studies on biodiversity.

**Trend of MEE scores between first and repeat cycles**

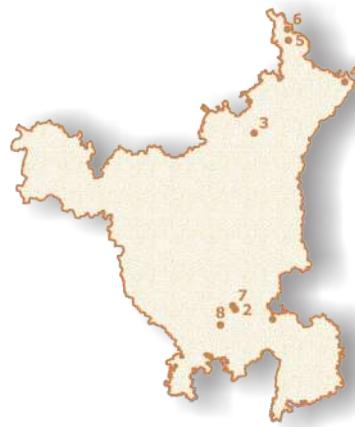
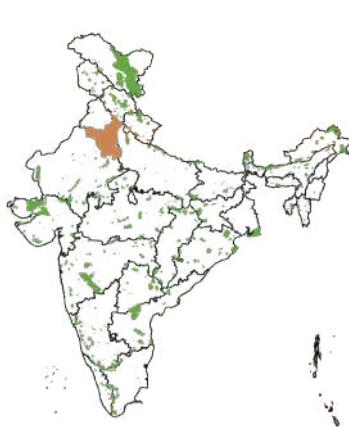
Sl. No	PAs	First Cycle			Repeat Cycle			Trend
		Phase	MEE Score (%)	Category	Evaluation Year	MEE Score (%)	Category	
1	Barda WLS	2006-2009	56.1	Fair	2018-2019	60	Good	▲
2	Balaram Ambaji WLS	2015-2017	60	Good	2020-2022	74.22	Good	▲
3	Bansda NP	2015-2017	75.83	Very Good	2020-2022	69.53	Good	▼
4	Gir NP & WLS	2012-2013	93.33	Very Good	2020-2022	81.25	Very Good	▼
5	Jambughoda WLS	2017-2018	66.67	Good	2020-2022	81.25	Very Good	▲
6	Jessore Sloth Bear WLS	2017-2018	57.76	Fair	2020-2022	67.19	Good	▲
7	Kachchh (Lala) GIB WLS	2017-2018	63.89	Good	2020-2022	67.97	Good	▲
8	Kachchh Desert WLS	2017-2018	65.52	Good	2020-2022	61.72	Good	▼
9	Khijadiya WLS	2015-2017	63.33	Good	2020-2022	71.09	Good	▲
10	Marine (Gulf of Kutch) NP & WLS	2006-2009	65.2	Good	2020-2022	71.09	Good	▲
11	Nal Sarovar Bird WLS	2015-2017	75	Very Good	2020-2022	77.34	Very Good	▲
12	Purna WLS	2012-2013	64.17	Good	2020-2022	49.22	Fair	▼
13	Shoolpaneswar (Dhumkhal) WLS	2009-2010	49.24	Fair	2020-2022	49.22	Fair	▼
14	Velavadar (Blackbuck) NP	2009-2010	66.94	Good	2020-2022	71.09	Good	▲
15	Wild Ass WLS	2006-2009	58.3	Fair	2020-2022	55.47	Fair	▼
16	Gaga (GIB) WLS	2017-2018	49.07	Fair	2022-2023	50.83	Fair	▲
17	Girnar WLS	2015-2017	78.33	Very Good	2022-2023	69.53	Good	▼
18	Hingolgadh WLS	2017-2018	81.9	Very Good	2022-2023	77.34	Very Good	▼
19	Mitiyala WLS	2017-2018	63.33	Good	2022-2023	65.63	Good	▲
20	Narayan Sarovar Chinkara WLS	2018-2019	65.5	Good	2023-2024	60.94	Good	▼
21	Paniya WLS	2018-2019	74.14	Good	2023-2024	73.33	Good	▼
22	Porbandar Bird WLS	2018-2019	67.59	Good	2023-2024	65.63	Good	▼
23	Rampara Vidi WLS	2018-2019	71.43	Good	2023-2024	75	Very Good	▲
24	Ratanmahal Sloth Bear WLS	2018-2019	72.5	Good	2023-2024	75.78	Very Good	▲
25	Thol Lake WLS	2018-2019	74.16	Good	2023-2024	67.97	Good	▼



Haryana



Indian Peafowl © Rupali Thakur



## Haryana

Haryana is located in the northern India with a total area of 44,212 Km<sup>2</sup>. The state's forest cover is 1,614.26 Km<sup>2</sup>, which is 3.65% of its total area (ISFR 2023). In the first and repeat cycles of MEE, 8 PAs were assessed.

### 1. Sultanpur NP, Haryana (2018-19):

Sultanpur NP was notified in 1989 and covers an area of approximately 142.5 hectares. It is an important tourist destination in Haryana, attracting significant numbers of visitors, particularly in winter for waterfowl viewing. The park has well-demarcated boundaries, defined management zones, an adequate road network for protection, low levels of biotic pressure, and a strong participatory network of stakeholders engaged in management processes as guides and guards.

However, the park faces challenges, including inadequate staff strength, a cumbersome process for fund release, and the absence of systematic monitoring of threats, which weaken management efforts.

**Recommendations** - Recommendations include preparing a scientific management plan using a landscape approach to include satellite wetlands, improving record-keeping, especially for VIP visits, filling all vacant positions, systematically monitoring threats, providing relevant training to outsourced staff, compiling various studies conducted by the BSI, ZSI, and BNHS, conducting studies on the impacts of climate change on the PA, and ensuring the systematic

involvement of NGOs in park management.

### 2. Bhindawas Lake WLS, Haryana (2020-22):

Bhindawas Lake WLS was notified in 2005 and covers an area of approximately 1,500 hectares (15 Km<sup>2</sup>). It serves as a Ramsar site and is an important ecological corridor along the Sahibi river, which flows from the Aravalli hills to the Yamuna river. The sanctuary is a natural part of the Yamuna river basin in a predominantly agrarian state and has the potential to connect with the wetlands of Khaparwas WLS. An approved management plan is in place; however, there are no habitations within the sanctuary, although embankments, roads, and plantations are used by villagers for movement and cattle grazing.

Ecological issues include salinity in agricultural lands, water pollution, and instances of liver fluke in cattle. The sanctuary is managed under the dual control of the wildlife and irrigation departments, and there are delays in the release of funds.

**Recommendations** - Recommendations include fencing the area and creating alternate routes to prevent unauthorized movement of people and cattle,

implementing the replacement of *Eucalyptus* and *Prosopis* as proposed by the Technical Committee of Wildlife in 2008, appointing an Honorary Wetland Warden and establishing a Wetland Advisory Committee. Additionally, efforts should be made to thin out reed patches and plant fruit-bearing trees, secure a corridor with Khaparwas WLS, and strengthen dialogue with the relevant departments to ensure conservation-friendly management of water bodies and agriculture.

### **3. Chhilchhila Lake WLS, Haryana (2020-22):**

Chhilchhila Lake WLS, also known as Sionthi RF, was notified in 2005 and covers an area of approximately 2.86 Km<sup>2</sup>. Situated close to Kurukshetra University, the sanctuary features a small lake formed in a natural depression that attracts many resident and migratory birds. The management of the PA falls under the director of Pipli zoo. It is an isolated area without a perennial water source, surrounded by multiple land uses. The water body has been progressively shrinking due to encroachment towards the graveyard side, although there are no habitations within the sanctuary, marking it as a potential eco-tourism site.

**Recommendations** - Recommendations include making arrangements with the concerned agency to maintain regular water flow to the PA, constructing a fence to prevent encroachment from the graveyard side, replacing eucalyptus trees with fruit-bearing trees, and improving fish populations to attract more birds.

### **4. Kalesar NP and WLS, Haryana (2020-22):**

Kalesar NP and WLS was notified in 2003, with each PA covering approximately 53 Km<sup>2</sup>. These PAs are connected to Simbalbara NP in Himachal Pradesh and Rajaji TR in Uttarakhand, making them significant for ecological continuity. Located at the tri-junction of Haryana, Himachal Pradesh, and Uttarakhand, this area is noteworthy as it is the only Sal forest region in Haryana. The management operates under dual control between wildlife and territorial administration, contrary to the Ministry of Environment, Forest and Climate Change (MoEFCC) instructions. The potential exists for the designation of a TR at the landscape level due to ecological contiguity with adjacent PAs. While the management plan expired in 2021, population trends of wildlife within the park are encouraging, and the area serves as a tourist destination. A highway bisects the PAs, and speed breakers are in place to

control traffic. Currently, there is one Inspector, six Wildlife Guards, and 48 territorial staff managing the area, but there is very little information available to the public regarding the PA.

**Recommendations** - Recommendations include preparing and implementing a new management plan, placing PA management under the wildlife department, examining the possibility of creating a TR over the landscape, enhancing involvement from stakeholders and NGOs for outreach, tourism management, and scientific database development, regulating traffic on the highway that passes through the PAs, and developing publicity materials along with an interpretation center.

### **5. Khol-Hi-Raitan (Morni Hills) WLS, Haryana (2020-22):**

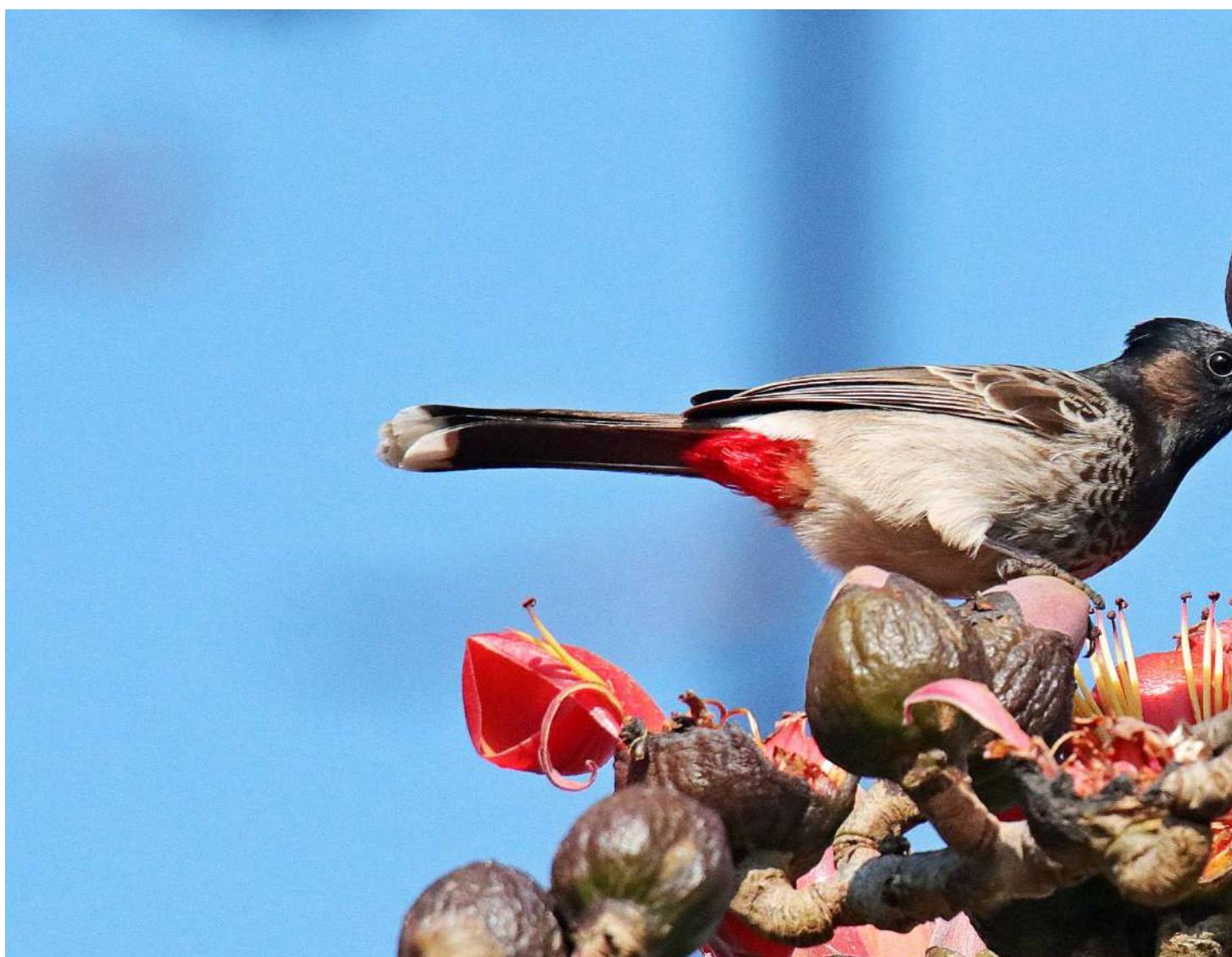
The PA, located in the Shivalik hills near Shikargarh WLS and Kalesar NP, was initially notified in 2004, with an area extended to 2,656 hectares in 2007. Following the notification, territorial areas were transferred without a corresponding transfer of staff. Water resources within the PA are satisfactory, and it features a bird safari, a Red Junglefowl breeding center, an interpretation center, and marked trekking routes that attract visitors.

However, the PA suffers from dual management control, with territorial staff responsible for booking forest offenses, conducting plantation works, and managing forest fire control, while wildlife staff oversee wildlife offenses and carry out wildlife management activities. Additionally, the area faces challenges from monkey menace, and promotional avenues for wildlife staff are limited.

**Recommendations** - Recommendations include taking action to incorporate neighboring forest areas into the PA network, removing dual control by consolidating management under one authority, transferring territorial staff to the PA, introducing fingerlings into water tanks, exploring promotional opportunities for wildlife staff, appointing lady officers, improving physical infrastructure, enhancing education, awareness, and scientific management efforts, and introducing entry fees at the gates.

### **6. Bir Shikargah WLS, Haryana (2023-24):**

Situated at the foothills of the Shivaliks, the PA, extending over to 7.67 Km<sup>2</sup>, is located in Panchkula district and is administered by the Deputy CWLW. It was notified in 2004. With high watershed values, the PA consists of dry deciduous forests and is home to animal species like leopard, Barking Deer, Sambar, Cheetal,



Nilgai, Wild Boar, Grey Langur, Jackal, Jungle Cat, Palm Civet, Red Indian Fox, Monitor Lizard, vultures, Red Junglefowl, Peafowl, Grey Francolin, Grey Hornbill, Green Pigeon etc. The WLS hosts the globally significant Bombay Natural History Society (BNHS) Vulture Breeding Centre, and has well demarcated boundaries and notified ESZ. Close to tourism hotspot of Morni hills, the PA does not have villages inside.

However, the PA is surrounded by several villages, and a few public roads pass through it, causing biotic disturbance, including HWC. Eco-development programmes are absent, and population estimation of major mammals are not undertaken. The management plan is awaiting approval, and a few vacancies of staff has not been filled. It also suffers from appropriate outreach programmes.

**Recommendations** - Recommendations include immediate approval of the management plan, which should provide guidance for a watershed-based

integrated conservation and development of the area, identification of an alternative to the Pinjore-Mallah road, establishment of barriers at the entry and exit of the road, studies on vehicular pollution, regular census of important species, constitution of eco-development committees and development of participatory eco-tourism, appropriate training to the staff, improvement of conservation awareness and education programmes, enhanced financial and technical support to the BNHS Vulture Breeding Centre, and improved protection strategies.

### **7. Khaparwas WLS, Haryana (2023-24):**

The Khaparwas lake, a man-made wetland, and part of the Jhajjar territorial division, extends to 204 acres and was notified in 1991. A potential eco-tourism site in the Delhi NCR, the periphery of the sanctuary is marked by an earthen bund. The site encompasses a mosaic of habitats: woodland with *Prosopis*, *Acacia* and *Eucalyptus* species, grassland habitat, marshland and



Red-vented Bulbul © Vivek Sarkar

wetlands. A place for migratory and resident birds, the PA is well supported by local communities.

However, there are nine villages within 5 km of the sanctuary, with a population of 17,000 and with cattle heads of about 6000, exerting significant biotic pressure. The PA does not have an independent administration, nor an approved management plan. The sewage from neighbouring areas pollutes the Khaparwas lake, leading to eutrophication of the lake. The management lacks appropriate eco-development, tourism, education and awareness infrastructures and activities, and suffers from required research and monitoring. Staff shortage is also felt.

**Recommendations** - Recommendations include constitution of a single administrative authority for Khaparwas and Bhindawas WLSs, and development of a scientific management plan, detailed hydrological study and regular monitoring of important species, diverting the canals bringing in the sewage to the lakes

to prevent pollution of the lakes, use of the embankment for planting appropriate trees/grasses, development of eco-development programmes, including participatory eco-tourism with local villagers, development of an interpretation centre and addition of neighbouring islands and bird landing sites to improve conservation value of the PA.

### 8. Nahar WLS, Haryana (2023-24):

Located in Rewari district, the 522-acre PA was notified on 30 January 1987. The sanctuary has a sub-tropical climate with semi-desert conditions. With more than 70% of the PA covered with *Prosopis juliflora*, it supports populations of Blackbuck, Nilgai, Jackal, Wild Boar and several reptiles and birds of semi-arid landscape. The PA is completely fenced and a 100-meter-wide ESZ has been notified uniformly all around the sanctuary. About 150 Blackbucks are kept in an open fenced area of 25 acres in the PA since 2011-12.

A small part of the PA lies detached from the main PA due to a road that cuts across the PA. There are villages around the PA, yet the PA lacks appropriate eco-development programmes. The PA suffers from absence of a management plan, research and monitoring activities, eco-tourism and adequate nature education and awareness programmes. The PA also lacks adequate protection infrastructure, staff and financial resources. The Blackbucks kept in captivity for over a decade have not been released in the wild.

**Recommendations** - The immediate need for effective



Northern plains gray langur © Rupali Thakur

management includes approval of the draft management plan, mitigation of adverse impacts of the Kosli-Kanina road that passes through the PA, study of the Jackal-Blackbuck relationship, study to facilitate release of captive blackbucks in the wild, improvement of staff numbers, skills and amenities, improvement of

protection infrastructure, development of eco-development programmes with local communities, including eco-tourism, and improvement of interpretation and education infrastructure and activities.

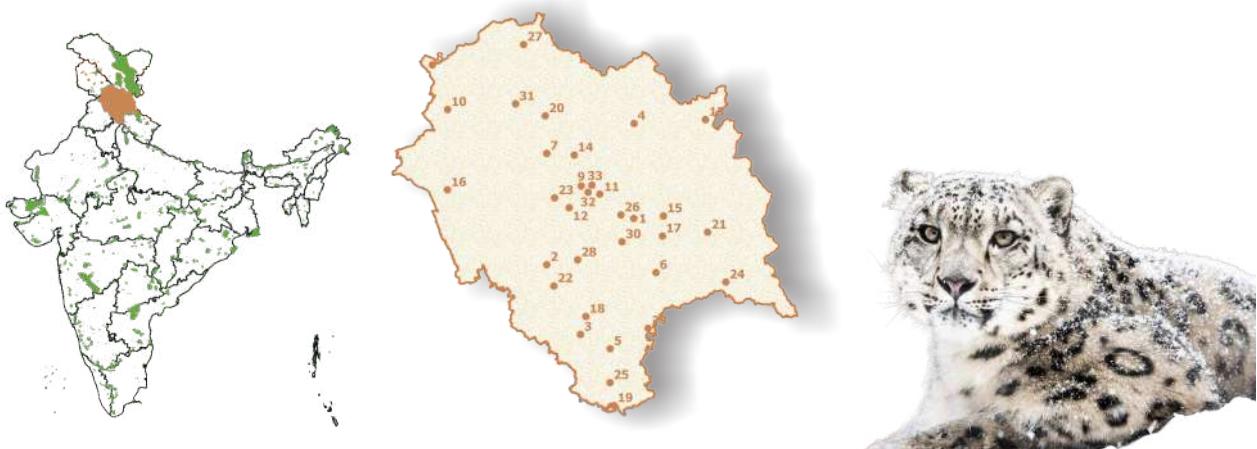
*Trend of MEE scores between first and repeat cycles*

Sl. No	PAs	First Cycle			Repeat Cycle			Trend
		Phase	MEE Score (%)	Category	Evaluation Year	MEE Score (%)	Category	
1	Sultanpur NP	2006-2009	56.1	Fair	2018-2019	64.17	Good	▲
2	Bhindawas Lake WLS	2012-2013	59.17	Fair	2020-2022	60.16	Good	▲
3	Chhilchila Lake WLS	2015-2017	61.67	Good	2020-2022	57.03	Fair	▼
4	Kalesar NP & WLS	2006-2009	59.8	Fair	2020-2022	75	Very Good	▲
5	Khol-Hi-Raitan (Morni Hills) WLS	2015-2017	57.14	Fair	2020-2022	68.75	Good	▲
6	Bir Shikargah WLS	2018-2019	45	Fair	2023-2024	50	Fair	▲
7	Khaparwas WLS	2018-2019	29.17	Poor	2023-2024	50	Fair	▲
8	Nahar WLS	2018-2019	41.67	Fair	2023-2024	50	Fair	▲

# Himachal Pradesh

Himalayan Griffon © Rupali Thakur





## Himachal Pradesh

Himachal Pradesh is located in the northern India with a total area of 55,673 Km<sup>2</sup>. The state's forest cover is 15,580.35 Km<sup>2</sup>, which is 27.99% of its total area (ISFR 2023). In the first and repeat cycles of MEE, a total of 31 PAs were assessed.

### 1. Great Himalayan NP, Himachal Pradesh (2018-19):

GHNP was notified in 1999 and spans an area of approximately 1,171 Km<sup>2</sup>. The park features an outstanding western Himalayan landscape and connects with Pin Valley NP through Sainj and Tirthan WLSs. Located near the towns of Kullu and Manali, it is a popular destination for trekkers, mountaineers, and nature lovers. The PA is largely free of encroachments and settlements, receives adequate funding from both central and state governments, and has well-trained and equipped staff along with effective participatory programs involving local communities. It also has an approved management plan and well-monitored habitat restoration programs.

However, much of the PA is inaccessible, which adversely affects the implementation of protection and development initiatives. The sanctuary experiences intense biotic pressure from livestock grazing and NTFP collection by nearby villages, and systematic wildlife monitoring is currently inadequate.

**Recommendations** - Recommendations include exploring buffer areas for trekking and ecotourism to

alleviate pressure from the existing ecotourism zone, involving NMHS (National Mission on Himalayan Studies) - Nature Learning Centre (NLC) project staff and research institutions to develop a biodiversity inventory and systematic wildlife population monitoring, and expanding and strengthening eco-development programs to enhance the livelihoods of livestock graziers and NTFP collectors.

### 2. Bandli WLS, Himachal Pradesh (2020-22):

The PA extends to 32.19 Km<sup>2</sup> and received its final notification in 2013. It features significant altitudinal variation, but water availability is a limiting factor. The PA has been identified as an IBA for the cheer pheasant. Although local people are poor, they have extensive rights in the forests, including access to timber, grazing, and migratory cattle grazing, leading to heavy biotic pressure. The area has untapped tourism potential but faces challenges such as being fire-prone and experiencing soil erosion due to steep slopes.

**Recommendations** - Recommendations include preparing a conservation plan for the cheer pheasant, implementing appropriate SMC works, creating EDCs, and exploring livelihood opportunities in eco-tourism

for the villagers.

### **3. Chail WLS, Himachal Pradesh (2020-22):**

The PA extends over 108.54 Km<sup>2</sup> and serves as the catchment for important tributaries of the Yamuna river. It has a long history of conservation and was once a hunting area for Maharaja Patiala. The PA was notified in 1993 and is connected to the Shimla Water Catchment WLS in the north through a forest corridor. It provides excellent habitat for pheasants.

However, the sanctuary faces significant biotic pressure from 112 villages that possess recorded rights, supporting large human and cattle populations. Seasonal pastoralists, including Gaddi and Gujjar communities, migrate into the area for grazing with permits. Wild animals in the PA are at risk of foot and mouth diseases, and the sanctuary also deals with monkey problems, fungal infections in deodar trees, and summer fires in Chir Pine areas.

**Recommendations** - Recommendations include preparing a comprehensive management plan, constituting EDCs to develop eco-tourism as a livelihood support for local people, and seeking assistance from the research institutes of HP to control forest diseases and mitigate fire risks.

### **4. Chandratal WLS, Himachal Pradesh (2020-22):**

The PA extends to 50.09 Km<sup>2</sup> and received its final notification in 2013, with an ESZ notified in 2016. Located in the high-altitude Lahul-Spiti region, it is identified as a Ramsar site due to its importance as a wetland of international significance. The PA constitutes the core area of the Chandratal Biosphere Reserve and features a lake surrounded by cold desert steppe meadows, providing crucial habitat for the snow leopard and its prey. However, there is limited information available regarding its flora and fauna. A camping site for tourists is situated about four kilometers away, and there are no human habitations within the PA. The impact of Yak grazing is limited due to the large size of the meadow, but nomadic pastoralists, including Gaddi and Gujjar, use the area during the summer, leading to excessive grazing.

**Recommendations** - Recommendations include establishing dialogue with pastoralists to reduce herd sizes, implementing rotational grazing practices, and promoting conservation efforts. Additionally, opportunities for eco-tourism should be explored as an alternative livelihood, arrangements for waste disposal need to be made, and improvements in staff

winter clothing and mobility are essential. Involving scientific institutions in conducting scientific studies is also recommended.

### **5. Churdhar WLS, Himachal Pradesh (2020-22):**

Churdhar WLS was notified in 1985, and it covers an area of approximately 56.47 Km<sup>2</sup>. The PA is situated in the outer Himalaya and is surrounded by territorial forests, making it part of a larger forested unit. There are no permanent settlements within the PA, but it features a popular temple at Churdhar peak, attracting a high volume of pilgrims. Pilgrim management is a multi-agency effort involving a committee of local residents and the district administration. The area has a complex rights regime concerning forest use by local communities and offers excellent tourism opportunities. WII has conducted a biodiversity survey, deployed 30 camera traps, and established a monitoring protocol.

A draft management plan has been submitted for approval, but the PA suffers from inadequate staff and physical infrastructure.

**Recommendations** - Recommendations include improving staff numbers and physical infrastructure, examining the settlement of pastoralists' rights through the community rights route under FRA or identifying alternate areas, developing the range office at Naurahdhar as a central hub for interpretation and PA entrance, creating a community-centered pilgrimage management system, utilizing monitoring protocols established by the National Conservation Foundation (NCF), National Centre for Biological Sciences (NCBS), and WII to enhance the scientific information base of the PA, and establishing several weather monitoring stations.

### **6. Daranghati WLS, Himachal Pradesh (2020-22):**

Daranghati WLS was notified in 2003 and encompasses an area of approximately 167.9 Km<sup>2</sup>. The PA is a high mountainous region with significant inaccessible areas. Although a draft management plan is yet to be completed, an ESZ was notified in 2021. The PA is located near a conservation breeding center and serves as a site for the release of captive-bred Western Tragopan. In 2020, WII conducted an assessment of biodiversity and established a monitoring protocol. The PA has no villages within it, but there are complex settlement rights for local communities in the demarcated protected forests. The range office



currently operates without ministerial staff, and there is an absence of participatory management. While there are excellent tourism opportunities, physical infrastructure is poor, and there is no interpretation center.

**Recommendations** - Recommendations include developing the DFO complex at Sarhan as a visitor center and interpretation area, expanding the use of established monitoring protocols, implementing climate change monitoring through weather stations, and recording snowfall patterns on the peaks. Additionally, staff amenities should be improved, ministerial staff should be posted in range offices, and funds should be provided for using drones and helicopters to protect the inaccessible areas.

## 7. Dhauladhar WLS, Himachal Pradesh (2020-22):

Dhauladhar WLS was notified in 1999 and covers an

area of 983 Km<sup>2</sup>. This high mountainous PA is managed by DFO, Hamirpur and has a management plan in place, with an ESZ notified in 2021. The sanctuary features temperate forests and alpine meadows and is recognized as an IBA under Criteria A1 (globally threatened species) and A2 (restricted-range species). It boasts outstanding scenic, hydrological, biodiversity, and cultural values. However, much of the PA is inaccessible, lacking motor roads, and the range offices have no clerks. While it is located near Bir Biling, an internationally renowned paragliding destination, the area suffers from poor eco-tourism and interpretation infrastructure.

**Recommendations** - Recommendations include posting an ACF under the DFO, Hamirpur and increasing staff strength, providing funds for heli-services, drones, and a wireless communication system for inspections and protection, developing Bir Biling for nature education, interpretation, and as a visitor



White rumped Vulture © Malasri Bhattacharya

center, expanding the camera trap monitoring designed by WII, conducting glacial and climate change studies, and implementing the recommendations from the March 2019 expedition by the DFO and team.

## 8. Gamgul-Siyabehi WLS, Himachal Pradesh (2020-22):

Gamgul-Siyabehi WLS was notified in 1984 and covers an area of 108 Km<sup>2</sup>. This high mountainous PA is largely inaccessible and possesses excellent ecological values. It has a management plan in place but is staffed with only four forest guards. Although there are no villages within the PA, fringe area villages have complex rights concerning forest resource use. Nomadic pastoralists use the area during the summer, leading to heavy grazing pressure. While the sanctuary presents excellent eco-tourism opportunities, it lacks EDCs, nature education initiatives, and interpretation

programs. Additionally, the protection infrastructure is inadequate.

**Recommendations** - Recommendations include developing the Bhadal Range Office complex as a visitor center, interpretation area, and gateway to the PA, posting additional staff to enhance protection efforts, constituting EDCs, and developing eco-development programs for livelihood support. Monitoring climate change should be conducted through phenology studies and by recording the arrival and departure of snow on the peaks. Dialogue should be initiated to address pastoralist grazing rights, either by settling community rights or providing alternative sites. The establishment of a Hangul breeding center should be considered, along with an examination of possibilities for reintroducing Hangul in its former range.

## 9. Kais WLS, Himachal Pradesh (2020-22):

Kais WLS was notified in 2006 and covers an area of approximately 11.71 Km<sup>2</sup>. It is a small PA situated within a large forested landscape, close to the town of Manali. A management plan and an ESZ are in place. Under the Japan International Cooperation Agency (JICA) Project, six Biodiversity Management Committees (BMCs) have been established, and microplans have been prepared. There are no villages within the PA, and biotic pressure mainly affects the fringe areas. While there are excellent tourism opportunities, the sanctuary currently lacks adequate visitor facilities, nature education, and interpretation resources.

**Recommendations** - Recommendations include surveying the boundaries and marking boundary pillars using DGPS technology, incorporating eco-tourism components into the BMC microplans, upgrading the Manali interpretation center, utilizing cultural festivals at Bijli Mahadev and Malana for outreach initiatives, establishing dialogue with hoteliers in Manali to promote eco-tourism and conservation education, considering the preparation of a landscape-level perspective plan, and introducing climate change monitoring.

## 10. Kalatop- Khajjiar WLS, Himachal Pradesh (2020-22):

Kalatop-Khajjiar WLS was notified in 1957 and covers an area of approximately 30.89 Km<sup>2</sup>. The PA includes the Kalatop forest and the Khajjiar meadow, often referred to as the "Switzerland of the East," and experiences high tourist visitations. There is only one village at the fringe of Kalatop, leading to low biotic



pressure; however, Khajjiar faces significant tourism pressure that is effectively managed by the Khajjiar Eco-tourism Society, headed by the PA manager. This society operates with financial and administrative autonomy similar to a tiger foundation. A management plan is in place, with excellent waste management practices in Khajjiar, where biodegradable waste is converted into manure, and there are commendable efforts to enhance Khajjiar lake. Boundary consolidation efforts, including locating old boundary pillars, have been successful, and sightings of the Chamba sacred Langur are common along the Kalatop-Khajjiar road.

Management efforts primarily focus on tourism management for Khajjiar and Kalatop, but there is inadequate information regarding the interior forests.

**Recommendations** - Recommendations include continuing the identification and construction of boundary pillars using Digital GPS technology, utilizing the volume of visitors for conservation education, improving information displays about the Chamba Sacred Langur, conducting a study on grazing by cattle and ponies at Khajjiar to assess its role in controlling weeds and tall grasses, organizing food stall owners and pony drivers into EDCs to enhance services and improve their incomes, forming a women's SHG and guiding them to use manure production as an income-generating activity, improving interpretation programs, and introducing climate change monitoring.

## 11. Kanawar WLS, Himachal Pradesh (2020-22):

Kanawar WLS was notified in 2002 and covers an area of approximately 28.3 Km<sup>2</sup>. It is a small PA managed by DFO (Wildlife), Kullu. The PA has tenuous linkages with the Great Himalayan NP (GHNP) through RFs. Currently, there are only three forest guards, and six beats from the Parvati division were transferred to the PA without a corresponding transfer of forest guards. There are no villages within the PA, and access is only on foot. A management plan and ESZ are in place, and boundary consolidation efforts are ongoing.

However, the sanctuary faces acute staff shortages and experiences heavy tourist and pilgrim footfall at the adjacent sacred sites of Kasol and Manikaran, leading to management challenges. Protection and interpretation infrastructure are inadequate, and there is no eco-development program in place.

**Recommendations** - Recommendations include transferring the posts of six Forest Guards from the Parvati division to the PA and posting additional staff; improving protection and interpretation infrastructure; establishing EDCs and introducing eco-development programs; upgrading the forest complex at Kasol for staff housing and as a visitor and interpretation center; initiating dialogue with tour operators and religious institutions to gain support for management; improving baseline information, and starting climate change monitoring.

## 12. Khokhan WLS, Himachal Pradesh (2020-22):

Khokhan WLS was notified in 2004 and covers an area of approximately 24 Km<sup>2</sup>. This small PA is situated close

to Kullu town and is well-known for tourism. It is managed by DFO (Wildlife), Kullu, and both a management plan and an ESZ are in place. Under the JICA Project, two BMCs have been established, with six sub-BMCs, one of which is located within the PA. Staff members have been sent to WII for exposure visits; however, there are no interpretation facilities, and the BMCs are not involved in tourism activities. Approximately 200 trekkers visit the PA annually.

**Recommendations** - Recommendations include utilizing the sub-BMC for eco-tourism at Mujag Thach, which is popular among trekkers; improving protection infrastructure; developing a landscape-level perspective plan for long-term conservation in consultation with GHNP; introducing climate change monitoring; and continuing the boundary consolidation work.

### 13. Kibber WLS, Himachal Pradesh (2020-22):

The PA spans 2,220 Km<sup>2</sup> and was notified in 1992. It is a high-altitude area characterized by temperate forests and alpine meadows, renowned for its high-value medicinal plants. The PA is home to approximately 30 Snow Leopards and various associated fauna of the high Himalayas. A management plan is in place, along with a well-defined ESZ. There are no villages within the PA, and populations of Himalayan Ibex and Blue Sheep are stable, with a growing number of Snow Leopards reported.

However, the area faces challenges including overgrazing by seasonal pastoralists in some regions, inadequate staff capacity and mobility to protect such a large area, and insufficient publicity and social media presence.

**Recommendations** - Recommendations include developing a dedicated website, improving interpretation and eco-tourism facilities, increasing staff numbers, enhancing facilities and mobility, and growing native alpine grasses in degraded pastures.

### 14. Manali WLS, Himachal Pradesh (2020-22):

The PA covers 29 Km<sup>2</sup> and is located near Manali town, with its final notification published in 2013. It features temperate Deodar and broad-leaved forests that provide significant watershed value. Approximately 200 trekkers visit the PA annually, which is home to notable fauna, including various bird species. There are no villages or encroachments within the PA, and it

abuts Kais WLS and some RFs, contributing to a larger ecological landscape. A management plan was developed through a participatory process, and stakeholder participation is strong. While funds, staff, and mobility are adequate, there have been reports of delays in the release of CSS funds and poor publicity, as the PA currently lacks a dedicated website.

**Recommendations** - Recommendations include preparing the next management plan based on WII guidelines, procuring a drone for monitoring inaccessible areas, and ensuring the timely release of CSS funds.

### 15. Pin Valley NP, Himachal Pradesh (2020-22):

The PA extends to 1,825 Km<sup>2</sup>, with a core area of 675 Km<sup>2</sup>, and was notified in 1985. It is part of the Cold Desert Biosphere Reserve and is contiguous with GHNP and Rupi Bhaba WLS. The PA features very high altitude, dry alpine steppe vegetation, and is home to rare flora. It supports a population of 200-250 Himalayan Ibex and serves as the habitat for the apex predator, the Snow Leopard. The PA is also part of the Government of India Project Snow leopard. A management plan is in place, with collaboration from the NCF, Snow leopard Trust, and WII on various projects.

During the summer months, the area is occupied by pastoral communities and their cattle, leading to resource competition between wild herbivores and livestock. Additionally, high HWC, medicinal plant collection, and increased tourism during the summer exacerbate management challenges. Currently, there are no EDCs or eco-development activities within the PA.

**Recommendations** - Recommendations include constituting EDCs among all villages, both inside and in the zone of influence, to support departmental works, including eco-tourism and mitigation of HWC. Additionally, the next management plan should be prepared following the guidelines of WII.

### 16. Pong Dam WLS, Himachal Pradesh (2020-22):

The PA covers 207.59 Km<sup>2</sup> and is a man-made wetland inundated by the dam on the Beas River. It includes four islands and was finally notified in 1999. Recognized as a Ramsar site, it serves as a wintering ground for migratory birds from the trans-Himalayas. The land is owned by the Bhakra Beas Management Board (BBMB),

but it is often utilized by Gaddi and Gujjar communities for grazing, as well as by agriculturists who depend on water inundation.

The area functions as a traditional transitional land for nomadic pastoralists moving to alpine regions during the summer, leading to issues of overgrazing. The lake is frequented by approximately 2,200 fishermen, and the fisheries department introduces commercially valuable fish, impacting the local fish population. Before the PA's final notification, dam-affected families were resettled in Anupgarh, Rajasthan, but many still rely on the PA for their livelihoods. Additionally, there is a lack of inter-departmental coordination.

**Recommendations** - Recommendations include constituting an all-inclusive steering committee headed by the Government Secretary, with the DFO as Member Secretary, to improve inter-departmental coordination and resolve local community issues. There should be regulations on net sizes and mesh dimensions to protect bird feed, encouragement of organic farming around the PA, establishment of EDCs for promoting eco-tourism, appointment of an ACF for improved managerial supervision, engagement of a veterinary doctor and ornithologist, and efforts to enroll farmers in the PM crop insurance scheme for crop loss compensation.

## 17. Rupi-Bhaba WLS Himachal Pradesh (2020-22):

Rupi-Bhaba WLS was notified in 2017 and extends over 503 Km<sup>2</sup> in the Dhauladhar range. The sanctuary features extensive alpine pastures and is connected to GHNP and Pin Valley NP. It supports 65 species of mammals and 200 bird species, many of which are rare. An ESZ has been notified surrounding the sanctuary, and officials from ITBP, Police, and Public Works Department (PWD) assist with fire protection, crime control, and civil works, respectively. Stakeholder participation in management processes is satisfactory, and there have been no reported HWCS.

However, the sanctuary faces significant management challenges, including overgrazing, medicinal plant collection, a shortage of accommodation for frontline staff, limited staff mobility, and a lack of information regarding the PA.

**Recommendations** - Recommendations include forming community committees to engage in plantation activities, developing water harvesting structures, and enhancing fire protection efforts; establishing an interpretation center; increasing the

number of frontline staff, improving their mobility, and strengthening protection infrastructure; and improving information dissemination about the sanctuary.

## 18. Shimla Water Catchment WLS, Himachal Pradesh (2020-22):

The PA covers 202 Km<sup>2</sup> and has been managed primarily as a catchment area for Shimla town since 1878. It was initially designated as a Protected Forest in 1952 and later notified as a WLS in 1956, with the final notification published in 1999. The PA has been managed by the Shimla Wildlife Division since 2009 and serves as a catchment for tributaries of the Yamuna river, collecting water from 25 sources at Churat, which is filtered before distribution to Shimla town. It connects with Chail WLS through the forests of the Shimla Forest Division, predominantly featuring deodar forests that are home to a high density of Koklass Pheasants. An ESZ of 27.5 Km<sup>2</sup> is in place, and there are no habitations or encroachments within the PA. Grazing permits are not issued to nomadic pastoralists, although three roads bisect the sanctuary, and pine forests in the lower areas are fire-prone. There are no meadows present, and a draft management plan has been prepared.

**Recommendations** - Recommendations include developing vegetation patches that occupy former habitations into grasslands, appointing an ACF in charge of the area for managerial supervision, upgrading two blocks to range status, controlling fires in chir pine areas, making water harvesting efforts more scientific, conducting periodic population censuses, establishing dialogue with stakeholders, and improving information dissemination regarding the PA.

## 19. Simbalbara NP, Himachal Pradesh (2020-22):

Simbalbara NP was notified in 2010 and covers an area of 27.88 Km<sup>2</sup>. It is situated adjacent to Kalesar NP and two RFs in Haryana, marking the westernmost limit of Sal and Cheetal. The park holds biogeographical significance as it is located at the tri-junction of the Himalayas, semi-arid hillocks, and Gangetic plains. Historically, the PA was a hunting reserve, and together with Kalesar WLS and the intervening forests, it has the potential to function as an ER.

However, the PA faces challenges from two villages on its periphery, which create biotic disturbances. Pastoralists use the area as a transitional zone while

migrating to the higher Himalayas, leading to conflicts with staff. The sanctuary has experienced heavy tree felling in the past, and significant management issues include a large open area, weed infestations, delayed funding, and insufficient publicity.

**Recommendations** - Recommendations include improving coordination with Kalesar WLS, relocating Pillodi village to free up river-side grassy habitat for Cheetal, posting staff at the entry gate, using drones for protection, and ensuring the timely release of funds.

## 20. Kugti WLS, Himachal Pradesh (2023-24):

Constituting upper catchment of river Ravi, the 405.49 Km<sup>2</sup> PA is administered by the DFO (Wildlife), Chamba and well connected to Tundah, Dauladhar and Nargu WLSs, becoming part of a high priority conservation landscape. It was notified in 2006. Consisting of Himalayan dry temperate mixed coniferous forests and alpine pastures and scrubs, it has rich endemic and medicinal flora. It harbours mammals like Goral, Himalayan Brown Bear, Asiatic Black Bear, Ibex, Himalayan Tahr, Himalayan Blue Sheep etc., with reports of the sighting of a Snow Leopard in 2010. About 100 bird species have been reported from the PA. It is free from human habitations. Local communities are supportive of the management.

The PA has high religious and cultural values, as the Kailash mountain and Mani Mahesh lake, and two famous temples occupy the southern fringe and part of the PA respectively. The PA suffers from inadequate protection infrastructure, difficult patrolling of inaccessible areas, inadequately numbered, trained and equipped field staff, financial constraints, and inadequate outreach activities.

**Recommendations** - Recommendations include integrated ecosystem management of the PA with climate resilience in focus, deployment of adequate number of well equipped and trained staff, improvement of the protection infrastructure, including mobility, use of modern technology for surveillance, surveys and monitoring, upgradation of interpretation centre for becoming handicapped friendly, systematic conduct of ecological studies with assistance from scientific institutions, identifying alternative funding mechanisms, revamping eco-development programme, including participatory pilgrimage management, improved coordination at landscape scale, and improved awareness and outreach activities.

## 21. Lippa-Asrang WLS, Himachal Pradesh (2023-24):

Representing sub-alpine and alpine ecosystems and constituting upper catchment of the river Sutlej, the PA is located in Kinnaur district and was notified on 7 June 2013. Falling under one single beat, the PA is administered by the DFO (Wildlife), Sarahan. The vegetation of the sanctuary is characterized by scattered Fir and Spruce trees, alpine scrub and meadows. Home to endangered species like Himalayan Ibex, Musk Deer, Blue Sheep, Snow leopard, Brown Bear, Bharal, Himalayan Tahr and Himalayan Weasel, the PA is contiguous with a larger forested landscape. The PA is adequately staffed and receives timely adequate funds. Local people have grazing rights but illegal tree felling, hunting and forest fires are absent.

Management weaknesses include absence of an approved management plan, inadequate wildlife training to staff, absence of support from NGOs and scientific institutions, inadequate mobility support for the staff, overgrazing of meadows by domestic livestock, and presence of a few patches of private lands within the PA.

**Recommendations** - Important recommendations include approval of the management plan, better coordination with the neighbouring territorial divisions and with line agencies, timely repairs and upgradation of communication system, improvement of skill and knowledge of the staff, improved public participation and implementation of eco-development programmes, including eco-tourism, and information generation on alpine pastures in collaboration with research institutions/NGOs.

## 22. Majathal WLS, Himachal Pradesh (2023-24):

Situated at the junction of Solan and Shimla districts, the PA, extending over 37.71 Km<sup>2</sup>, was initially notified in 1974 and the final notification was issued on 30 November 2013. A representative of middle Himalaya, the PA predominantly exhibits sub-tropical Chir Pine forests with scattered good patches of Ban Oak, Deodar and Blue Pine. The sanctuary is surrounded by the forests of Kunihar, Shimla and Suket territorial forest divisions. Important mammals include leopard, Himalayan Black Bear, Yellow-Throated Marten, leopard Cat, Goral, Barking Deer, Sambar, Wild Boar and Indian Crested Porcupine. Birds like Chir and Khalij pheasants, Red Junglefowl, Himalayan Griffon Vulture

etc. add to its high conservation value. An ESZ of 12.68 Km<sup>2</sup> is notified on 7 June 2017.

However, there are nine villages inside the PA and 47 villages around it, exerting severe biotic pressure of resource extraction on the PA, including unauthorized grazing by migratory herders, despite suspension of such rights by the Supreme Court. About 40 gun licenses are held by the villagers. Two temples are located within the PA, attracting about 10,000 pilgrims annually. The PA lacks necessary ecological information and eco-development programmes.

**Recommendations** - Important recommendations include suitable resettlement of the nine villages outside the PA, development of participatory eco-development programmes, including eco-tourism and pilgrim management to provide alternative income to the villagers, their involvement in PA protection, improved habitat management, development of Standard Operating Procedure (SOP) for fire management, conducting necessary biodiversity studies, engaging local youth in education, awareness and PA protection, and improvement of mobility to the staff.

### 23. Nargu WLS, Himachal Pradesh (2023-24):

Spreading across two districts, Mandi and Kullu, the PA was earlier notified in 1999, and after rationalization of boundaries, an area of 132.37 Km<sup>2</sup> was notified on 29 November 2013. Across the landscape, the PA shares its boundary with other PAs/RFs, such as Khokhan, Dhauladhar, Tundah and Kugti, and contributes to high hydrological and corridor values. Due to varied topography and altitudinal gradient, the PA harbours sub-tropical to sub-alpine forests with associated flora, many of which are endemic. Recognized as IBA, the PA has four species of pheasants, such as Himalayan Monal and White-Crested Khalij. Many rare and threatened mammals, such as Black Bear, Goral, Himalayan Yellow-Throated Marten, Himalayan Civet etc. have been reported. A 50.04 Km<sup>2</sup> ESZ around the PA was notified on 25 March 2022. After the rationalization of boundaries, all the villages have been excluded from the PA.

However, of the notified area, only 63 Km<sup>2</sup> area is under administrative control of the Wildlife Division, and the rest is with the Territorial Division. The PA lacks an approved management plan, patrolling registers, and ecological information on the PA resources. The ESZ is not demarcated properly.

**Recommendations** - Recommendations include action to include the 69 Km<sup>2</sup> notified area in the PA, completion of draft management plan and its immediate approval, development of an assessment and monitoring protocol for biodiversity inventory, use of modern technology for surveillance, monitoring and management, upkeep of necessary management registers, ESZ boundary demarcation, implementation of eco-tourism programmes, including development of guard hut at Kashmbi Silh nursery as interpretation centre cum camping hut, and improvement of dissemination tools and awareness programmes.

### 24. Rakchham Chitkul (Sangla Valley) WLS, Himachal Pradesh (2023-24):

Representing the valley of Baspa river, close to the Tibetan plateau that harbours a rich array of plants and animals from the Great Himalaya as well as the Trans-Himalaya, the PA, extending over 304 Km<sup>2</sup> is administered by the DFO (Wildlife), Sarhan and was notified on 7 June 2013. It constitutes the upper catchment of river Sutlej and is characterized by rugged topography with steep rocky and gentle alpine slopes and wide glacial valleys. The Himalayan dry coniferous and moist broad-leaved forests, alpine scrubs and meadows provide home to animals like Himalayan Musk Deer, Brown Bear, Asiatic Black Bear, Common Leopard, Snow Leopard, Leopard Cat, Himalayan Tahr, Goral, Bharal, Himalayan Serow and a number of birds and herpetofauna. A 464.8 Km<sup>2</sup> wide ESZ was notified on 26 July 2017. An IBA, the PA does not have villages inside.

However, there are villages around the lower slopes of the valley, where the animals migrate to during winters. Livestock grazing also takes place there. Ever increasing tourism in proximate areas like Sangla and Chitkul is promoting development of physical infrastructure and pollution in PA vicinity. The PA lacks an approved management plan, adequate communication and scientific studies on the biodiversity.

**Recommendations** - Major suggestions include advance APO planning due to short availability of working season, improved technological support for PA protection, close cooperation between PA management, Tourism Department, and local people to develop sustainable and eco-friendly tourism, development of eco-development committees and programmes, ecological studies, periodic systematic population estimation and monitoring in coordination with scientific institutions and NGOs, immediate

approval of management plan and close coordination with Indo-Tibetan Border Police (ITBP) for PA protection.

## 25. Renukaji WLS, Himachal Pradesh (2023-24):

Located in lesser Himalaya in Sirmaur district, the PA with an area of 402.8 ha. was notified on 23 October 1999, and is administered by DCF (Wildlife), Shimla. The 20 ha. wide Renukaji lake, a typical Himalayan oligotrophic lake and the largest natural lake of HP, lies within the PA and was notified a Ramsar site in 2005. The sanctuary marks the northern boundary of natural Sal forests, has leopard, Sambar, Barking Deer, well protected rich fish fauna and a diverse range of aquatic and forest birds, as well as butterflies and herpetofauna. There is also a mini zoo, and an ESZ over 15.29 Km<sup>2</sup>, including 3.32 Km<sup>2</sup> over private land, has been proposed. It is adequately staffed and funded and has no villages inside.

The PA has great religious and cultural significance and the temples and lakes are visited by pilgrims all through the year. A grand annual fair, bringing about 1.5 lakh pilgrims over a period of 10 days, is held before Deepawali, which puts PA management under additional use-area demand pressure. The PA does not have an approved management plan, has inadequate communication facilities, especially in the interior areas, lacks NGO contribution, and the Renukaji lake and Parashuram Tal experience progressively increasing silting due to soil erosion.

**Recommendations** - The Recommendations include integration of management of the two water bodies with PA management, systematic management and regulation of pilgrimage utilizing participatory eco-development approach, closer coordination with neighbouring divisions, improvement of skills, knowledge and amenities of frontline staff, protection of the lakes from silting, systematic surveys and monitoring of wildlife, and establishment of an interpretation centre and improved outreach function at the Renukaji temple site.

## 26. Sainj WLS, Himachal Pradesh (2023-24):

Part of the Great Himalayan NP Conservation Area (GHNPCA), the PA is located in Kullu district with an extent of 90 Km<sup>2</sup>, and was notified on 23 October 1999. The notified combined ESZ extends to 265 Km<sup>2</sup>. Predominantly, a temperate to alpine area, the PA along with GHNPCA is home to 427 genera and 832 species of plants. The area is also home to more than

375 faunal species, including 183 birds and more than 30 families of insects. Representing the globally significant 'Western Himalayan Temperate Forests and High Alpine Ecosystems', the region was inscribed as a World Heritage Site in 2014. The PA is administered under unified control of the Chief Conservator of Forests (CCF), Shamshi. The PA has trained staff and protection infrastructure. It receives adequate and timely funds. The local communities are organized into biodiversity conservation societies.

There are three villages inside the sanctuary, with 52 households with cattle, and having the right to cultivate their lands within the PA, measuring 58 ha. thus, causing severe biotic pressure. The PA lacks an approved management plan. Other threats include proliferation of physical infrastructure in the buffer area, increasing pressure of tourism, lack of alternative livelihoods in the ESZ and the lack of an integrated conservation and development plan for the larger region. The staff number is less than required, as one Forest Guard, on average, looks after 63 Km<sup>2</sup> very difficult area.

**Recommendations** - Recommendations include preparation of a management plan, based on landscape approach, notify exclusive ESZ for the PA, use of modern technology for protection, assessment and monitoring, rationalization of Beat size and appropriate deployment of staff, upscaling the training of staff, preparation of a master plan for existing ESZ, involving local communities in PA management and eco-tourism, improvement of PA outreach function, long-term ecological monitoring and climate change studies, economic evaluation of ecosystem services, and development of a comprehensive HWC strategy.

## 27. Sech Tuan Nala WLS, Himachal Pradesh (2023-24):

Located in the Pangi landscape of HP, and consisting of significant glacial source of river Chenab, the PA extends to over 390.29 Km<sup>2</sup> and administered by the DFO (Wildlife), Chamba. It was notified in 2010. Along the high altitudinal gradient, the vegetation ranges from Himalayan dry temperate mixed conifers to alpine pastures, rich in endemism and medicinal plants. An IBA site, it lies in the high snowfall area, and has animals, such as the Black Bear, Goral, Ibex, Brown Bear, Musk Deer, Snow leopard, Chir Pheasant and Monal. Adequate information boards and signage are properly displayed. Most of the villages have been voluntarily relocated from the PA and have strict community rules for protection of wildlife.

A culturally and religiously significant Buddhist heritage area, the local people are supportive of conservation. However, there is one village inside the PA, with moderate biotic impact. The area is visited by pilgrims. The area has large beat sizes and managed without an approved management plan. It lacks EDCs and institutional eco-development programmes, necessary ecological information on biodiversity and climate, adequate number of staff and equipment, a sustainable eco-tourism plan, and adequate funds.

**Recommendations** - The Recommendations include putting in place an approved management plan, constitution of EDCs and implementation of participatory microplans, systematic assessment and monitoring of wildlife with assistance from scientific institutions, identification of an eco-tourism zone with handicapped friendly interpretation centre, identifying alternative financing, deployment of adequate numbers of trained and equipped field staff, and improved awareness and outreach activities.

## 28. Shikari Devi WLS, Himachal Pradesh (2023-24):

The PA, extending over to 29.94 Km<sup>2</sup>, is located in Mandi district and was notified after rationalization of boundaries, on 7 June 2013. Predominantly a temperate area, the PA has excellent coniferous and mixed broad leaf forests. Recognized as an IBA, the PA has several endangered species like Black Bear, Goral, Fox, Himalayan Yellow-Throated Marten, Himalayan Palm Civet, leopard Cat, Koklass Pheasant, Khalij Pheasant, Himalayan Griffon etc. An ESZ of extent 19.20 Km<sup>2</sup> around this sanctuary was notified on 5 January 2022. The area acts as an upper catchment to the Sutlej and Beas rivers. An interpretation centre complex is being completed at the entry of the PA.

The 113 villages, excluded from the PA during rationalization, continue to exert pressure on the PA. Poaching, scarcity of foods during winter, transmitted diseases, forest fires, disturbance during the breeding season, nomadic Gujjars, noise pollution and littering have been identified as threats to the WLS. About 2.5 to 3 lakh pilgrims visit the Shikari Devi temple, situated on the periphery of the PA. It also suffers from lack of scientific information on PA resources.

**Recommendations** - Recommendations include preparation and approval of the management plan, resolving the livestock grazing, especially by Gujjars, improved management of pilgrims and their movement within PA, improved awareness and dissemination activities, development of protocols for

assessment, monitoring and protection, improved coordination with the neighbouring territorial divisions, capacity enhancement of territorial staff, villagers, tour operators and involvement of local communities in eco-tourism and pilgrim management.

## 29. Talra WLS, Himachal Pradesh (2023-24):

Bordering the forests of Uttarakhand, the 46.42 Km<sup>2</sup> PA is located in Shimla district and was notified on 7 June 2013. Administered by the DFO (Wildlife), Shimla, the tract lies between the temperate and alpine zones and drains into Tons river. It has finest forests of Oak, Horse Chestnut, Maple, Birch, Rhododendron, Deodar, Spruce, Silver Fir and Blue Pine. The sanctuary has the highest density of Black Bears in HP, and is inhabited by mammals like leopard, Himalayan Fox, Himalayan Musk Deer, Barking Deer, Yellow-Throated Marten, Goral etc. and birds like Monal, Khalij and Chir Pheasant, and several other. Approved management plan is in place. There are no villages in and around the PA, and a 22.56 Km<sup>2</sup> wide ESZ has been notified on 21 November 2017.

However, migratory Gujjar and Gaddi communities use this area for livestock grazing from May to October, causing seasonal, intense grazing pressure. The PA management lacks necessary ecological information, interpretation and education infrastructure and programmes, adequate equipment and amenities for the field staff, and appropriate protection infrastructure.

**Recommendations** - Important recommendations include conducting systematic scientific inventory and monitoring of biodiversity, improvement of protection infrastructure, equipping field staff with appropriate technology and field kits, better coordination with neighbouring forest divisions, including in Uttarakhand, regulation of customary grazing by migratory herders, and exploration of eco-tourism opportunities for the local people.

## 30. Tirthan WLS, Himachal Pradesh (2023-24):

Part of GHNPCA, the PA is located in Kullu district with an extent of 61 Km<sup>2</sup>, and was notified on 1 November 1999. The notified combined ESZ extends to 265 Km<sup>2</sup>. There is no human settlement in this sanctuary, but the notification permits the erstwhile rights of the nearby local villagers to continue. The forest area consists of extensive stands of Oaks and coniferous forests, and the species-rich meadows contain plants with high medicinal value. Home to a range of temperate and

alpine wildlife, the area forms the upper catchments of the river Beas. The sanctuary, with only two beats is managed under the unified command of the CCF Shamshi, who controls GHNPCA. At community level, biodiversity conservation societies have been formed. The PA has trained staff and protection infrastructure. It receives adequate and timely funds.

The main identified threats are the continued dependence of the local communities on the bio-resources, development of physical infrastructure in the buffer area, the increasing pressure of tourism, a lack of alternative livelihoods in the ESZ and a lack of an integrated conservation and development plan for the region. The PA lacks an approved management plan and dedicated staff for the PA.

**Recommendations** - Recommendations include preparation of a management plan, based on landscape approach, notify exclusive ESZ for the PA, use of modern technology for protection, assessment and monitoring, rationalization of beat size and appropriate deployment of staff, upscaling the training of staff, preparation of a master plan for existing ESZ, involving local communities in PA management and eco-tourism, improvement of PA outreach function, long-term ecological monitoring and climate change studies, economic evaluation of ecosystem services, and setting up of a centralized data base on bioresources.

### **31. Tundah WLS, Himachal Pradesh (2023-24):**

Located at the junction of Tundah Nallah and River Ravi and constituting upper catchment of River Ravi, the 64.22 Km<sup>2</sup> PA is administered by the DFO (Wildlife), Chamba. Consisting of Himalayan dry temperate mixed coniferous forests and alpine pastures and scrubs, it has rich, high altitude endemic and medicinal flora. It harbours mammals like Himalayan Brown Bear, Asiatic Black Bear, Ibex, Himalayan Tahr, Himalayan Blue Sheep etc. and several bird species of higher mountains, including some endangered pheasants. It is free from human habitations and is well buffered by neighbouring forest areas.

The PA management suffers from short working season due to long snowy period, absence of an approved management plan, inadequately numbered, equipped and deployed field staff, absence of a systematically generated data base on PA values, difficulties of patrolling inaccessible terrain, and absence of participatory eco-development plan.

**Recommendations** - Major suggestions include advance APO planning due to short availability of working season, putting in place an approved management plan, improved technological support for PA protection, close cooperation across landscape, development of eco-development committees and programmes, ecological studies, periodic systematic population estimation and monitoring in coordination with scientific institutions, identification of alternative financing, development of a handicap-compliant interpretation centre, and improved awareness and outreach programmes.

### **32. Inderkilla NP, Himachal Pradesh, (2023-24):**

The evaluation of Inderkilla NP, Himachal Pradesh could not be made by MEE REC due to certain reasons. The observation of the REC is submitted as follows:

During interaction with State FD, it was informed that the intent notification of Inderkilla NP has been made vide notification no. FEE-B-F(6)11/2005 dated 28.7.2010 in 104 sq km area, but there has been no progress in securing the notified area within PA network till date and the area is still with Kullu territorial forest division.

In the previous evaluation (first cycle), the MEE committee recommended that "Himachal Pradesh State FD to expedite process of transferring the notified area to wildlife wing of Himachal Pradesh and complete all the necessary formalities, such as settlement of rights, collection of baseline data and preparation of management plan. The new PA needs to be strengthened in all aspects at the earliest". However, it is noted that no progress has been made in this regard.

In view of above, the committee recommends that formalities to include Inderkhila NP into PA network should be completed expeditiously.

### **33. Khirganga NP, Himachal Pradesh:**

The evaluation of Khirganga NP, Himachal Pradesh could not be made by MEE Regional Expert Committee due to certain reasons. The observation of the Committee is as follows:

- 1) During interaction with State FD, it was informed that the Khirganga NP, duly notified on 28th July, 2010, has not been handed over to wildlife wing from Parbati territorial division. It was further informed that handing over of Khirganga NP(KGNP) has been directed by higher

authorities vide letter no 2413 dated 9th August, 2021.

- 2) In view above, REC noted that the KGNP, though, legally (intent) notified but is under administrative control of Parbati territorial division. Therefore, committee made an effort by requesting Principal Chief Conservator of Forests - Head of Forest Force (PCCF-HoFF) on 11th December 2023 (and reminder on 15th January, 2024) to facilitate field assessment of the Park by REC as per required evaluation sheet of MEE. However, no response was received till date. Therefore, the committee could not carry out any field visits.
- 3) It is noted that in the previous evaluation (first cycle), the MEE committee recommended that "Himachal Pradesh State FD to expedite process of transferring the notified area to wildlife wing of Himachal Pradesh and complete all the necessary formalities, such as settlement of rights, collection of baseline data and preparation of management plan. The new PA needs to be strengthened in all aspects at the earliest". However, it is observed that no progress has been made in this regard by the State FD.
- 4) The committee further noted that around 250 Km<sup>2</sup> of Khir Ganga Demarcated Protected Forests Area, though forming part of GHNP, has also not been transferred/handed over from Parbati territorial division to GHNP management authority.
- 5) The committee also observed that Khir Ganga NP is part of larger PA network (3000 sq km) adjoining the world heritage site GHNPCA and intended to be managed as per PA protocol on landscape approach. It was further noted that forming a larger PA network (including Khirganga NP) around the listed world heritage site, GHNPCA, forms an assurance from the state to UNESCO.
- 6) In view of above, the committee strongly recommends that Khir Ganga NP to be handed over to wildlife wing at the earliest, after completing all necessary formalities, so that it could be managed on the lines of NP protocol.

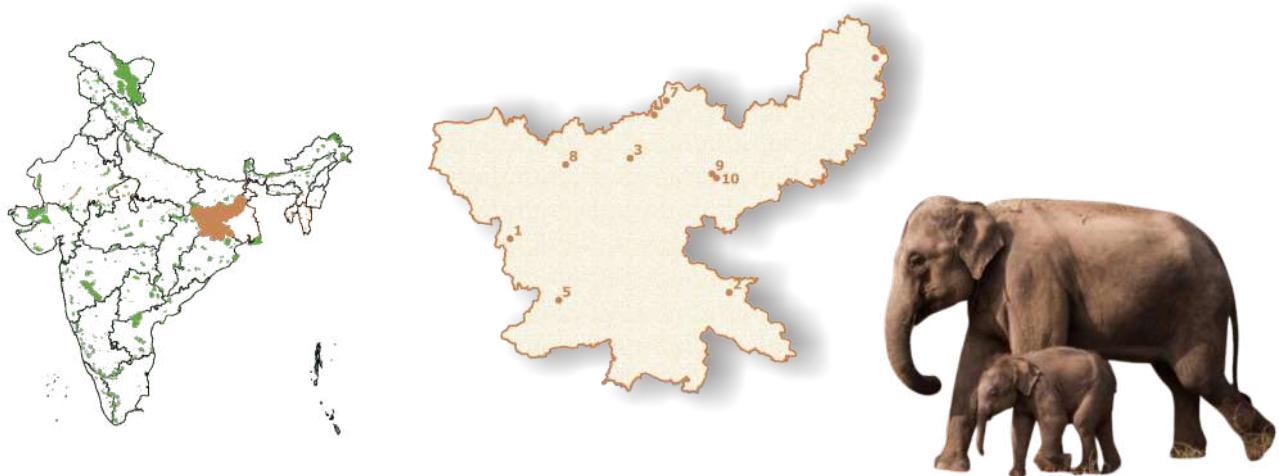
**Trend of MEE scores between first and repeat cycles**

Sl. No	PAs	First Cycle			Repeat Cycle			Trend
		Phase	MEE Score (%)	Category	Evaluation Year	MEE Score (%)	Category	
1	Great Himalayan NP	2006-2009	76.5	Very Good	2018-2019	84.17	Very Good	▲
2	Bandli WLS	2017-2018	45.83	Fair	2020-2022	92.19	Very Good	▲
3	Chail WLS	2017-2018	53.33	Fair	2020-2022	69.35	Good	▲
4	Chandratal WLS	2017-2018	53.33	Fair	2020-2022	77.34	Very Good	▲
5	Churdhar WLS	2017-2018	55	Fair	2020-2022	59.68	Fair	▲
6	Daranghati WLS	2017-2018	56.67	Fair	2020-2022	64.52	Good	▲
7	Dhauladhar WLS	2017-2018	34.17	Poor	2020-2022	65.32	Good	▲
8	Gamgul Siyabehi WLS	2017-2018	65.74	Good	2020-2022	62.9	Good	▼
9	Kais WLS	2017-2018	49.17	Fair	2020-2022	67.19	Good	▲
10	Kalatop-Khajjiar WLS	2017-2018	72.41	Good	2020-2022	71.09	Good	▼
11	Kanawar WLS	2017-2018	43.33	Fair	2020-2022	60.94	Good	▲
12	Khokhan WLS	2017-2018	43.33	Fair	2020-2022	72.58	Good	▲
13	Kibber WLS	2009-2010	45.31	Fair	2020-2022	80.47	Very Good	▲
14	Manali WLS	2015-2017	53.33	Fair	2020-2022	85.94	Very Good	▲
15	Pin Valley NP	2009-2010	49.22	Fair	2020-2022	77.34	Very Good	▲
16	Pong Dam WLS	2015-2017	65	Good	2020-2022	76.56	Very Good	▲
17	Rupi Bhaba WLS	2015-2017	64.17	Good	2020-2022	68.75	Good	▲
18	Shimla Water Catchment WLS	2015-2017	62.93	Good	2020-2022	78.91	Very Good	▲
19	Simbalbara NP	2012-2013	60.83	Good	2020-2022	70.31	Good	▲
20	Kugti WLS	2018-2019	73.33	Good	2023-2024	76.56	Very Good	▲
21	Lippa Asrang WLS	2018-2019	53.33	Fair	2023-2024	60.94	Good	▲
22	Majathal WLS	2018-2019	58.33	Fair	2023-2024	61.72	Good	▲
23	Nargu WLS	2018-2019	70	Good	2023-2024	64.84	Good	▼
24	Rakchham Chitkul (Sangla Valley) WLS	2018-2019	56.67	Fair	2023-2024	69.53	Good	▲
25	Renukaji WLS	2018-2019	55.83	Fair	2023-2024	66.41	Good	▲
26	Sainj WLS	2018-2019	82.5	Very Good	2023-2024	81.25	Very Good	▼
27	Sech Tuan Nala WLS	2018-2019	60	Good	2023-2024	65.63	Good	▲
28	Shikari Devi WLS	2018-2019	62.93	Good	2023-2024	65.63	Good	▲
29	Talra WLS	2018-2019	55.17	Fair	2023-2024	53.91	Fair	▼
30	Tirthan WLS	2018-2019	84.17	Very Good	2023-2024	85.94	Very Good	▲
31	Tundah WLS	2018-2019	60	Good	2023-2024	74.22	Good	▲
32	Inderkilla NP	-	No Notification	-	2023-2024	PA under the jurisdiction of territorial Division	-	-
33	Khirganga NP	-	No Notification	-	2023-2024	PA under the jurisdiction of territorial Division	-	-



Jharkhand

Spotted Owlets © Vivek Sarkar



## Jharkhand

Jharkhand is situated in the eastern India, with total geographical area of 79,716 Km<sup>2</sup>. The state's forest cover is 23,765.78 Km<sup>2</sup>, which is 29.81% of its total area (ISFR 2023). In the first and repeat cycles of MEE, a total of 10 PAs were assessed.

### 1. Mahuadarr Wolf WLS, Jharkhand (2018-19):

Mahuadarr WLS was notified in 2002 and covers an area of approximately 400 Km<sup>2</sup>. The sanctuary is situated in an agro-pastoral landscape and supports one of the largest breeding populations of wolves in India. It is connected to Palamau TR through tenuous corridors that extend to some PAs in Chhattisgarh. The beautiful Lodh waterfall within the PA also attracts visitors. The management has recently initiated efforts to engage local communities, activate EDCs, and enhance nature awareness programs to reduce left-wing extremism.

Despite these efforts, the PA faces significant heavy biotic pressure from 25 proximate villages and around 62 villages in the zone of influence. Engagement with EDCs and villagers, particularly for livelihood improvement, suffers due to an acute shortage of staff, inadequate and irregular release of funds, and overall neglect of the PA. Tourism at Lodh Fall is not effectively managed, and there are no facilities for nature interpretation or visitor convenience. Additionally, there is a lack of systematic ecological research and monitoring.

**Recommendations** - Recommendations include the immediate finalization of the management plan, upgrading the PA administration to a sub-division level with appropriate staffing under the Field Director of Palamau TR, improving protection infrastructure including staff housing, providing refresher training on wildlife management for staff, ensuring continuous engagement with local communities and EDCs to develop livelihood improvement programs and ecotourism at Lodh fall, establishing an interpretation center at Lodh fall, enhancing overall interpretation, awareness, and publicity programs, and soliciting technical and financial support from the Palamau TR Foundation for ecological research and monitoring, including studies on mining issues.

### 2. Dalma WLS, Jharkhand (2020-22):

The PA covers 193.22 Km<sup>2</sup> and was notified in 1976. It serves as the catchment area for the Subarnrekha river and Dimna lake near Jamshedpur, providing a habitat for migratory birds, although it is not widely known. The PA has been identified as an IBA and is frequented by elephants migrating from Odisha and West Bengal. It is the most visited PA in Jharkhand, attracting approximately 50,000 visitors annually. The area

experiences challenges from left-wing extremism and tribal ritual hunting. Local NGOs and Tata Zoological Park assist in addressing extremism, ritual hunting, and providing conservation education. Complaint and visitor feedback registers are maintained, and there is a visitor center along with eco-lodges and amenities at Makulakocha. An ESZ was notified in 2012, and the PA maintains a good presence on social media platforms.

However, there is no management plan in place, and significant vacancies exist among frontline staff. There are 29 revenue villages within the PA and a larger number surrounding it, leading to high biotic pressure, including marginal encroachment for agriculture. Heavy traffic on nearby roads, the presence of residential areas, and illegal mining activities, allegedly for gold, further compound these issues.

**Recommendations** - Recommendations include filling staff vacancies, improving protection infrastructure, developing eco-development programs in collaboration with local villagers, establishing an animal rescue center, securing a veterinary doctor and supporting staff on deputation, making highways safe for wildlife crossings, upgrading tourism facilities, and controlling ritual hunting through dialogue with tribal communities, combined with strict supervision and action, including stopping the sale of hunting equipment in local markets.

### 3. Hazaribagh WLS, Jharkhand (2020-22):

The PA was notified in 1976 and was once known as the home of Sambar Deer. It covers an area of 186.25 Km<sup>2</sup>, consisting of 52 Km<sup>2</sup> of RFs—where the rights of villages have been settled—and 134 Km<sup>2</sup> of protected forests burdened with local resource use rights. The survey and boundary demarcation have been completed. The PA features a well-forested area that serves as the catchment for many streams and lakes. Predominantly consisting of tropical deciduous forests, it forms part of the important "Palamu-Lawalong Landscape," which connects various TRs, PAs, and RFs across Chhattisgarh, Bihar, and Jharkhand. A management plan and an ESZ are in place, and the PA attracts about 15,000 visitors annually to its cultural sites and natural assets.

However, 72 villages are spread across the PA, causing heavy biotic disturbance, and the area is also affected by left-wing extremism. Corridor linkages are tenuous, largely due to severe biotic disturbances, and approximately 21 hectares of the PA have been diverted for the widening of National Highway 33. Many frontline staff positions remain vacant, resulting

in weak protection infrastructure, inadequate visitor amenities, and minimal social media presence.

**Recommendations** - Recommendations include filling staff vacancies and improving staff capacities, enhancing protection infrastructure, developing eco-development programs with local villagers, entrusting day-long tourism management to local communities, securing a veterinary doctor and supportive staff on deputation, upgrading tourism facilities, establishing an interpretation center at Rajderwa, and improving publicity, research, and monitoring efforts.

### 4. Kodarma WLS, Jharkhand (2020-22):

The PA spans 150.28 Km<sup>2</sup> and was notified in 1985. Located in the Chhota Nagpur plateau, it contains some of the finest peninsular Sal forests within tropical deciduous formations and serves as an important watershed for the Photlahiya river. Rich in floral and faunal diversity, the PA is situated in the middle of the Chatra-Koderma-Dumka elephant corridor, although the connectivity is tenuous. An ESZ was notified in 2019, but the draft management plan has yet to be approved. The sanctuary is managed by DFO, Hazaribagh, and 22 EDCs are active in protection activities. A task force comprising staff and EDC members has been established to prevent illegal mining within the PA. Local institutions, NGOs, and community members participate in periodic surveys, animal rescue operations, and education and awareness programs.

However, the PA faces significant challenges, including a large number of vacancies among frontline staff, as National Highway 31 bisects the sanctuary into two halves. The area is also situated over a mica belt, making it susceptible to mica mining. The EDCs have limited finances for community welfare activities. There are 18 villages within the PA, which experience illegal tree felling, agricultural encroachment, fire, and poaching. Additionally, there is a shortage of funds for community projects, compensation payments, upgrading protection infrastructure, and nature education.

**Recommendations** - Recommendations include filling staff vacancies and improving their capacities, enhancing protection infrastructure, revitalizing eco-development programs with local villagers to improve protection and provide better livelihood opportunities, managing pilgrimage activities through EDCs, increasing publicity, research, and monitoring efforts, implementing wildlife protection measures on NH 31, and disposing of confiscated condemned vehicles.



## 5. Palkot WLS, Jharkhand (2020-22):

Notified in 1990, the PA covers 183.18 Km<sup>2</sup> and is situated within a large human-dominated landscape of about 760 Km<sup>2</sup> in the Chhota Nagpur plateau. The PA provides connectivity to Badalkot WLS and serves as a migratory route for elephants from the Singhbhum ER. It is also a potential habitat for Sloth Bears, with WII conducting a study on this species. The PA holds watershed significance and includes several important historical, cultural, and religious sites.

National Highway 143 bisects the PA, and there are 90 villages within its boundaries, with over 100 located within five kilometers of the PA. The area is heavily utilized by local communities for sustenance and is also affected by serious left-wing extremism. A total of 79 EDCs have been formed, with 35 receiving funding; however, there has been no action on the ground due to the absence of microplans.

**Recommendations** - Recommendations include

revitalizing the EDCs by completing microplan approvals and implementation, providing necessary funds for community welfare activities, appointing a full-time RO, filling existing staff vacancies and enhancing their capacities, establishing a camping site for senior officers within the PA, identifying eco-tourism areas and developing facilities for visitors, and improving protection infrastructure, including staff mobility.

## 6. Udhwa Lake Bird WLS, Jharkhand (2020-22):

The PA spans 565 hectares and is a permanent wetland located in the floodplains of the Ganga River, formed by the waters of the Farrakka barrage delivered through a 25 Km long Udhwa Nallah. It connects Pataura and Berhale lakes and was notified in 1991, providing an excellent assemblage of resident and migratory birds. The PA is an IBA situated along the migratory route of the Central Asian Flyway (CAF) and



holds significant religio-cultural and eco-tourism value. The administration of the PA is managed by DFO, Sahebganj. There are six villages within the PA and 24 in the notified ESZ, with seven EDCs established in the ESZ.

However, a portion of the submerged area that was inundated belonged to local agriculturists, whose compensation claims were not fully settled. As a result, affected individuals continue to raise paddy in this area during the summer months. The PA does not have an approved management plan, boundary demarcation has only just begun, and there are ongoing threats from illegal fishing, bird poaching, and encroachment for cultivation.

**Recommendations** - Recommendations include obtaining approval for the draft management plan from the competent authority, settling compensation issues with agricultural landowners to eliminate summer paddy cultivation within the PA, examining the

relocation of the six enclave villages, focusing on energizing eco-development programs in the ESZ, considering the extension of the PA along the length of the Udhwa Nallah, and improving protection and eco-tourism infrastructure.

## 7. Gautam Buddha WLS, Jharkhand (2022-23):

Gautam Buddha WLS was notified in 1976 and spans an area of 124.22 Km<sup>2</sup>. The PA is elongated, consisting of two distinct parts that are joined tenuously along a north-south axis, and an ESZ surrounding the PA was notified in 2019. It is integrated with Palamau TR through Lawalong WLS and Latehar RFs, forming an important elephant-tiger corridor in central-east India that stretches from Sanjay Gandhi NP in Madhya Pradesh to Bhimbandh WLS in Bihar. The sanctuary primarily features peninsular Sal forests, mixed dry deciduous forests, and Bamboo brakes, housing several endemic and endangered species of plants and animals. The area serves as the catchment for the Mahane river.

However, there are 71 villages within the ESZ and 29 villages inside the PA, leading to very high biotic disturbance. Much of the PA is inaccessible due to prevailing left-wing extremism. Other management challenges include a shortage of staff, poor protection infrastructure, linear developments such as National Highway 2 and a proposed freight corridor running through the PA, heavy cattle grazing, local collection of forest produce, a lack of ecological research and monitoring, and weak community engagement.

**Recommendations** - Recommendations include consolidating the PA boundaries by constructing pillars, cairns, or trenches; socio-ecologically planning to declare areas up to and around the ESZ as a Conservation Reserve; involving local NGOs and institutions in ecological and social research and monitoring; maintaining 10 snags or downed logs per hectare of forest; strengthening the protection network, especially to address challenges in a violently disturbed forest area; improving cattle disease surveillance and vaccination efforts; developing community-driven eco-tourism through participatory organizations such as EDCs or VSS; and implementing mitigation measures to reduce the impact of linear infrastructures on wildlife and habitat.

## 8. Lawalong WLS, Jharkhand (2022-23):

The PA covers 211.03 Km<sup>2</sup> and was notified in 1978. It forms an integrated and contiguous landscape with



*Pale-billed flowerpecker © Sipu Kumar*

Palamu TR and Latehar RF, and a large ESZ surrounding the PA was notified in 2019. The sanctuary features dry mixed deciduous forests, along with patches of peninsular Sal and Bamboo, providing immense hydrological and ecological value. It represents the rich biodiversity of the Chhota Nagpur plateau and holds great importance for the rural subsistence economy.

However, there are 126 villages in the extensive ESZ and 64 enclaves within the PA, which heavily depend on its resources for food, fodder, fuel, livestock grazing, and water. The PA experiences open boundaries and challenges related to left-wing extremism, as well as inadequate protection infrastructure, including insufficient staff numbers, training, and equipment. Additionally, engagement and communication with local communities are lacking, which weakens the effectiveness of the PA.

**Recommendations** - Recommendations include consolidating the PA boundaries by constructing pillars, cairns, or trenches; developing socio-ecological plans to declare areas up to and around the ESZ as a Conservation Reserve; involving local NGOs and institutions in ecological and social research and monitoring; maintaining 10 snags or downed logs per hectare of forest; strengthening the protection network to address challenges in a disturbed forest area; improving cattle disease surveillance and vaccination efforts; and developing community-driven eco-tourism initiatives through participatory organizations such as EDC or VSS.

## 9. Parasnath WLS, Jharkhand (2022-23):

The PA, with an area of 49.33 Km<sup>2</sup>, was notified in 1984. It abuts Topchanchi WLS, a small PA in the south and a common ESZ surrounding both PAs was notified in 2019. The undulating hills and valleys are crisscrossed by many perennial streams and contain Central Indian tropical moist and dry deciduous forests, hill forests and patches of peninsular Sal forest, providing habitats to several endangered and threatened species of plants and animals of the region. The geomorphological characteristics of Deccan plateau with environmental conditions of Himalayan foothills give this area a unique ecological value. Elephants migrating from Dumka forests to Hazaribagh use both these PAs. A highly revered Jain, spiritual and culture centre, the PA attracts a large number of devotees and tourists.

There are 79 villages in the ESZ and one enclaved village, depending on the PA for livestock grazing, timber and firewood, NTFP and employment from pilgrimage. Inadequate number of staff and poor protection infrastructure, especially in view of threat of left-wing extremism, unregulated movement of pilgrims and absence of ecological research and monitoring weaken management effectiveness.

**Recommendations** - Recommendations for the PA include consolidating boundaries using pillars or cairns to clearly define the sanctuary; systematically conducting population estimations of key faunal species to monitor their numbers and health; improving habitat management through effective

water and fire management efforts; retaining 10 snags or den trees per hectare of forest to support biodiversity; filling existing staff vacancies and enhancing their capacities, facilities, and deployment to ensure effective management; and improving overall protection infrastructure in light of challenges posed by left-wing extremism.

Furthermore, it is essential to enhance cattle disease surveillance efforts in the surrounding villages to prevent the spread of diseases; develop community-based eco-tourism initiatives to manage pilgrimage activities in a way that protects the PA while improving the livelihoods of local people; and conduct systematic scientific studies on the unique ecology of the area to better inform conservation strategies and management practices.

## 10. Topchanchi WLS, Jharkhand (2022-23):

The PA, covering 12.82 Km<sup>2</sup> and notified in 1978, lies next to Parasnath WLS, with an ESZ surrounding both

PAAs notified in 2019. The geomorphological and environmental features of this PA are similar to those of Parasnath WLS, allowing it to be treated as an extension of the same. The PA forms the catchment area for Rajdaha Reservoir (Topchanchi Jheel), which provides drinking water to cities like Dhanbad and Jharia, and attracts various water birds and tourists. However, the PA is under heavy human pressure, with 22 villages situated within the ESZ and 16 enclaved villages. The reservoir is managed by the Modified Area Development Agency (MADA), but there is no management plan or baseline information available.

**Recommendations** - Recommendations include implementing the suggestions previously made for Parasnath WLS, improving tourism management in collaboration with local communities and MADA, and enhancing the ecological information base of the PA to support its designation as a Ramsar site.

*Trend of MEE scores between first and repeat cycles*

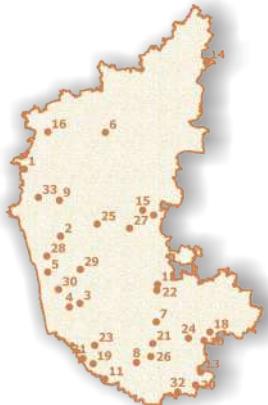
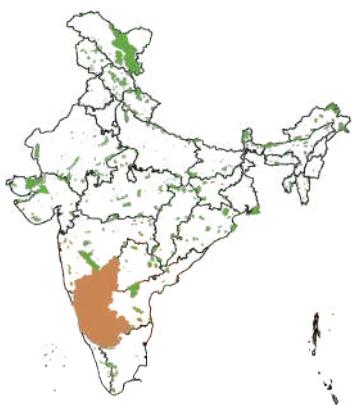
Sl. No	PAs	First Cycle			Repeat Cycle			Trend
		Phase	MEE Score (%)	Category	Evaluation Year	MEE Score (%)	Category	
1	Mahuadanr Wolf WLS	2006-2009	42.4	Fair	2018-2019	60.83	Good	▲
2	Dalma WLS	2006-2009	69.7	Good	2020-2022	60.16	Good	▼
3	Hazaribagh WLS	2009-2010	53.91	Fair	2020-2022	62.5	Good	▲
4	Kodarma WLS	2012-2013	51.67	Fair	2020-2022	56.25	Fair	▲
5	Palkot WLS	2015-2017	62.5	Good	2020-2022	60.94	Good	▼
6	Udhwa Lake Bird WLS	2015-2017	60	Good	2020-2022	50.81	Fair	▼
7	Gautam Buddha WLS	2017-2018	56.67	Fair	2022-2023	53.13	Fair	▼
8	Lawalong WLS	2017-2018	46.67	Fair	2022-2023	52.34	Fair	▲
9	Parasnath WLS	2018-2019	58.33	Fair	2022-2023	60.16	Good	▲
10	Topchanchi WLS	2018-2019	43.33	Fair	2022-2023	45.31	Fair	▲



Karnataka

Terrestrial Crab © Joel Correa





# Karnataka

Karnataka is located in the southern part of India, covering an area of 191,791 Km<sup>2</sup>. The state's forest cover is 23,765.78 Km<sup>2</sup>, which is 29.81% of its total area (ISFR 2023). In the first cycle of MEE, a total of 27 PAs are assessed. In the repeat cycle, 31 PAs are assessed, of which 6 new PAs are evaluated, and 2 PAs that were part of the first cycle assessment are excluded, as they are part of TR which undergoes a separate MEE assessment.

## 1. Bhimgad WLS, Karnataka (2020-22):

The PA extends to 190.43 Km<sup>2</sup> and was carved out of the Belgaum forest division, with its notification occurring in 2011. Currently managed as one of the ranges of the Belagavi forest division, the PA is situated in the core of the Western Ghats, forming a natural corridor for tigers and elephants between Kali TR and the Mahaveer and Madei WLSs in Goa. The Barapede caves within the sanctuary are known to be the only roosting and breeding site for the endangered and endemic Wroughton's free-tailed bat. Featuring evergreen and semi-evergreen forests on steep slopes and forest-grassland formations in the valleys, the PA supports rich floral and faunal diversity and serves as the catchment for seven major and minor rivers. Additionally, it has eco-tourism potential and contains several limestone caves as well as the ruins of the historical Bhimagad fort. A management plan is in place, and the PA is included in the All India tiger census.

However, there is biotic disturbance due to the presence of 13 revenue villages within the PA. Local NGOs have assisted in the relocation of Talewadi village. The boundaries of the PA have not been

consolidated, and it faces challenges including staff shortages and communication issues, the presence of eucalyptus plantations, the fire-proneness of the grasslands, late fund releases, absence of research, inadequate eco-development programs, and a lack of eco-tourism and nature education initiatives.

**Recommendations** - Recommendations include erecting boundary pillars to consolidate the PA boundaries, restructuring the PA administration by making it an independent division, and in the interim, rationalizing the area by creating additional ranges and corresponding staff postings. Conducting periodic censuses of all prey and predator species, improving protection infrastructure, persuading more villages to relocate outside the PA, conducting special studies on the endangered bats, and providing financial incentives to the staff are also important actions to enhance management effectiveness.

## 2. Gudavi Bird WLS, Karnataka (2020-22):

The PA covers 73.68 hectares, including 33 hectares of water-spread area, and is surrounded by moist deciduous forest. The water-spread area consists of

two ponds separated by an earthen bund, and the PA is managed under the Shivamogga wildlife division. A management plan and an ESZ are in place; however, bird censuses are not conducted regularly. Previous reports suggest a good assemblage of birds, butterflies, and spiders in the PA, but earlier recommendations from MEE have not been complied with. Local communities show support for the PA.

Despite having a fenced boundary, about eight hectares of the PA are reportedly encroached upon. The presence of prolific water weeds, siltation of the water body, and soil erosion negatively impact the sanctuary. The growth of numerous tree species, as well as natural vegetation surrounding the ponds, has led to increased monkey populations, which cause damage to nests and eggs. There is only one vacant post for a Forest Guard, and a village road runs through the PA. Additionally, there are issues with inadequate and delayed funding.

**Recommendations** - Recommendations include establishing boundary pillars with proper numbering, conducting periodic bird censuses, regularly monitoring water quality and siltation in the water body, removing small earthen mounds from the water body to create a larger, uniform water-spread area for safe bird landing, discontinuing new tree plantations within and around the PA, examining the practice of depositing revenue earned from the PA to the Bhadra Tiger Foundation, and instead making arrangements to deposit such revenue with the CCF in Shimoga for timely release and proper use. Improving interpretation and nature education facilities is also essential.

### 3. Jogimatti WLS, Karnataka (2020-22):

The PA covers 100.5 Km<sup>2</sup> and is located in the Eastern Ghats of the Deccan Plateau, characterized by predominantly dry deciduous and thorny scrub forests. It was notified in 2015 and is managed under the Chitradurga forest division, holding high watershed value. An approved management plan is in place, and there are no villages within the PA, which is situated close to Chitradurga town. However, the sanctuary consists of isolated forests that lack appropriate ecological connectivity.

Surrounding the PA are 37 villages that exert significant biotic pressure on the area. Currently, there are no EDCs established. The sanctuary contains old exotic plantations that offer low wildlife habitat value and are susceptible to seasonal fires, along with extensive weed infestations. Additionally, the staff lacks training

in wildlife management, and funds are often not released in a timely manner.

**Recommendations** - Recommendations include ensuring the timely release of funds and the approval of the management plan; initiating actions to declare the adjoining RF as a WLS to ensure ecological connectivity with outlying forests; removing exotic plantations following due process and developing those areas into suitable wildlife habitats; eliminating windmills from the PA whose leases have expired; improving the mobility and capacities of staff; enhancing interpretation and nature education facilities; developing eco-development programs with villagers living on the periphery of the PA; and completing the construction of the peripheral road.

### 4. Kudremukh NP, Karnataka (2020-22):

Kudremukh NP was notified in 1987 and currently covers an area of 600.57 Km<sup>2</sup> after the addition of leased areas from Kudremukh Iron Ore Ltd. in 2007 and Kudremukh Peak in 2011. It is located almost midway between Goa and Nilgiris in the Western Ghats and is managed by the Kudremukh wildlife division, which also oversees the Mookambika and Someshwara WLSs. The National Tiger Conservation Authority (NTCA) agreed in principle in 2012 to upgrade the PA to a TR. The park is one of the least disturbed wet evergreen forest and Shola-grassland biomes, hosting the largest population of the highly endangered and endemic Lion-tailed Macaque in India. In addition to its watershed, carbon sink, and biological values, the PA serves as a vital link connecting several PAs of Karnataka along a north-northwest and south axis. It is part of regular tiger and co-predator monitoring exercises, and an approved management plan is in place. The PA is also recognized as a World Heritage Site, a trekkers' paradise, and an employment provider for local communities through eco-tourism.

However, there are 41 villages within the PA, along with about 108 revenue enclosures. Since 2009, 289 willing families have been relocated from the PA, while 333 families are still awaiting relocation, as adequate funds for this purpose have not yet been provided. The sanctuary's management faces administrative challenges due to its spread over three districts. Significant management problems include the presence of exotic plantations over 7,090 hectares, tenuous connectivity across PAs, poor protection infrastructure, potential threats from left-wing extremism, low self-generated revenue, the vulnerability of grasslands (which occupy about 30% of



Bonnet Macaques © Uddalak

the area) to man-made fires, the absence of in-house research and monitoring, and an acute shortage of staff.

**Recommendations** - Recommendations include relocating the remaining willing families and persuading others to move out of the PA, filling frontline staff vacancies, posting a veterinary doctor and a research officer within the division to oversee the three PAs, ensuring the timely release of funds, authorizing the ACF to attend district-level meetings representing the division, discouraging the extension and construction of village roads, improving the protection network, providing financial incentives to frontline staff, and developing interpretation facilities.

## 5. Mookambika WLS, Karnataka (2020-22):

The PA extends over 370.37 Km<sup>2</sup> of contiguous low-elevation evergreen and semi-evergreen forests in the

central Western Ghats. It was constituted through multiple notifications issued since 1978, combining 21 RFs, and is administered under the Kudremukh wildlife division. The PA serves as a vital link between two PAs along a north-south axis. A management plan is in place, and all but one recommendation from the previous MEE concerning eco-development has been implemented. With high watershed value, it acts as a lifeline for the agricultural and semi-urban economy of downstream Dakshin Kannada. The PA is home to five species of non-human primates, including endemic species, and is an important link for the long-term conservation of tiger ecosystems. It is also recognized as an IBA and serves as a natural laboratory for scientific research and education.

However, there are 38 revenue enclosures within the PA, along with many more surrounding it. The area experiences heavy pilgrimage traffic to the Mukambika temple.



Management challenges include poor protection infrastructure, staff vacancies (as the corresponding staff from transferred territorial areas have not been reassigned), inadequate scientific information, and the fact that the PA spans two districts.

**Recommendations** - Recommendations include transferring vacancies and posting necessary staff, establishing APCs in newly acquired areas, improving staff capacity, mobility, and deployment; transferring the Information Bureau (IB) from the PWD to the FD; enhancing research and veterinary support and requesting timely fund releases; rationalizing beat sizes to ensure a single Forest Guard can manage their area effectively; and providing financial incentives similar to those available for frontline staff working in other PAs.

## 6. Yadahalli Chinkara WLS, Karnataka (2020-22):

The PA spans 96.37 Km<sup>2</sup> and was notified in 2015 under the Bagalkot territorial division. It represents the largest intact and pristine stretch of scrub forest in the region, surrounded by agricultural fields and human habitations. The sanctuary forms the catchment area for two rivers and is known to be at the southernmost limit of the endangered Chinkara, which has a declining population of about 90 individuals. The draft management plan is currently in the approval process, and an ESZ has been notified. The PA enjoys the support of local people and holds significant religious and cultural values.

However, there are 18 private leases for temporary cultivation, one village, and two patches of private lands that exert biotic pressure on the PA. Additionally, pets and feral dogs move within the sanctuary, posing threats to the Chinkara, and ritual hunting continues. The PA suffers from inadequate protection infrastructure, including insufficient staff numbers and capacities.

**Recommendations** - Recommendations include consolidating the boundaries by erecting marked pillars and improving the numbers and functioning of APCs to prevent encroachments and intrusions by people, cattle, and dogs; enhancing habitats, particularly for the Chinkara; providing financial incentives to staff, similar to those offered to frontline staff in other PAs; regularly monitoring the Chinkara population and improving overall protection infrastructure and efforts; and appointing ROs exclusively for the PA.

## 7. Adichunchunagiri Peacock WLS, Karnataka (2022-23):

Adichunchunagiri Peacock WLS was notified in 1978 and covers an area of approximately 1.27 Km<sup>2</sup>. This small PA is managed as part of one beat of the Nagamangala range and is located adjacent to the famous Adichunchunagiri Shrine and Mutt, where peafowl are revered and protected. The sanctuary includes RFs and some private land, with rights reportedly settled for local landowners. Local communities are generally supportive of protection efforts, largely due to their religious beliefs. There is one protection camp inside the PA, and a management plan is in place, though there has been only partial compliance with previous MEE suggestions.

Despite more than four decades since its notification, there is ongoing confusion regarding the status of a portion of the PA that is occupied by some villagers and reported as encroachments. Additionally, pilgrims



Small Gliding Frog © Daniel Miranda

traveling to the shrine move freely within the PA, leading to challenges in management. Engagement with shrine authorities has been inadequate, and there is only one permanent staff member, along with a few on contract. Peafowl have also been reported to damage crops in adjacent villages.

**Recommendations** - Recommendations include verifying the status of human-occupied areas within the PA and consolidating boundaries accordingly, initiating regular monitoring of the peafowl population and its habitat, involving shrine management and local residents in PA management, and providing greater attention to the sanctuary's needs.

### 8. Arabithittu WLS, Karnataka (2022-23):

Arabithittu WLS was notified in 2010 and covers an area of approximately 5.59 Km<sup>2</sup>. This small, isolated PA is completely fenced and is situated close to the city of Mysuru along the Mysuru-Madikeri highway. The presence of the Defense Research Development Organization (DRDO) within the PA further enhances its security. The sanctuary is managed by a RO, who also oversees the nearby Ranganthittu Bird WLS and Melapur Conservation Reserve, with a Deputy RO stationed on site. The management plan for this sanctuary has been revised, and it receives adequate financial support, though there has been only partial compliance with previous MEE suggestions.

However, due to its isolation and fencing, the PA lacks ecological connectivity. It also suffers from an absence of scientific studies and monitoring programs, as well as inadequate publicity, interpretation, and education

initiatives.

**Recommendations** - Recommendations include improving visitor facilities and developing relevant publicity and education programs, creating a scientific database on the biodiversity of the PA and systematizing monitoring efforts, establishing eco-development initiatives—such as eco-tourism in collaboration with villagers to enhance their livelihoods—and improving coordination with the DRDO to strengthen protection and conservation education.

### 9. Attiveri Bird WLS, Karnataka (2022-23):

The PA covers 2.26 Km<sup>2</sup> and includes a reservoir that spans 100.96 hectares; it was established in 2000. The man-made irrigation reservoir was constructed across the Tayavvanahalla stream in Yellapur forest division, Uttar Kannada district, in 1992. The PA also incorporates 12 acres of private land and features about 20 small islands. Dominated by southern moist deciduous forest, the PA's remaining trees in the submerged area, along with Bamboo groves and marshy vegetation, support a large number of resident and migratory birds. At the landscape scale, the PA is well connected to nearby lakes and forests throughout the Yellapur region. Periodic training sessions are provided to officers and staff, as well as members of the North Karnataka Birders Network and farmers from Dharwad and Uttar Kannada districts during events such as the Bird festival, Hornbill festival, and Kalinga Snake festival. Some ecological studies focusing on birds have been conducted, and MEE scores have

improved since the last assessment.

Despite these strengths, the PA faces several limiting factors, including water scarcity during the summer months and the threat of forest fires. Management challenges are compounded by the lack of significant research activities, an overpopulation of catfish in the reservoir, inadequate eco-tourism and nature interpretation facilities and programs, and a shortage of funding.

**Recommendations** - Recommendations include improving intersectoral coordination with line departments, educational and scientific institutions, and NGOs; instituting regular specialized training programs; replacing exotic species with native fruit-bearing plants; removing catfish from the reservoir; and developing better tourist facilities.

### 10. Bannerghatta NP, Karnataka (2022-23):

The PA is situated near Bengaluru city and was initially notified in 1971, with the final notification issued in 2004. This area is home to a historical pilgrimage center and provides continuity to the landscape, connecting the Satyamangalam forest in the south with BRT TR, MM Hills, and Cauvery WLS in southern Karnataka. The PA features a biological park focused on conservation breeding, as well as a zoological park and a butterfly park. Its boundaries are well-protected with various types of barriers, and several scientific organizations and individuals have contributed to building a substantial database on the PA, which also benefits from CSR contributions. Publicity and visitor amenities are commendable, and a management plan is in place.

However, the PA still contains six hamlets that were not removed despite its notification as a NP. Straying incidents of elephants and leopards from the PA present regular concerns for management, leading to a high level of HWC. Moreover, public participation in planning or management is currently nonexistent.

**Recommendations** - Recommendations include including the fringe population and city stakeholder groups in the planning and management of the PA, soliciting CSR support for publicity, awareness generation, and the development of HWC response infrastructure, institutionalizing systematic recording and monitoring of wildlife diversity, habitat, and threats by field staff, enhancing collaborative periodic census and research with interested individuals and organizations, and prioritizing human-leopard conflict management.

### 11. Brahmagiri WLS, Karnataka (2022-23):

Brahmagiri WLS was notified in 2011 and covers an area of approximately 181 Km<sup>2</sup>. Administered under the Kodagu Division, the PA lies along the Kerala border in a largely linear arrangement, abutting Wayanad TR to the west, Kodagu forests to the north, and coffee estates to the east. This large forested landscape is part of the World Heritage Sites of the Western Ghats, inscribed in 2012. The sanctuary features a high diversity of ecosystems, ranging from moist deciduous forests to montane Shola formations, and several NGOs such as WTI, Coorg Wildlife Society, and local educational institutions are active in the area. There are no human settlements within the PA, and the subsistence dependence of coffee estate laborers on the sanctuary is minimal. The area attracts a high visitor footfall, especially at sites like Arippu Falls, making it a popular tourism destination. Additionally, it serves as a case study for best practices in mitigating human-elephant conflict.

However, the PA faces management difficulties, including high HWC along its eastern boundary, a 30% vacancy rate among frontline staff, the absence of an institutional monitoring system, and inadequate participatory management. While many estate owners are supportive of PA management, the corridor to Nagerhole TR in the southeast remains tenuous. Previous MEE recommendations have only been partially met.

**Recommendations** - Recommendations include enhancing staff capacities to systematically record and monitor PA attributes and challenges, establishing early warning systems involving estate management and local inhabitants to track elephant movements in habitations, continuing efforts to acquire private lands in the southeast corridor leading to Nagerhole TR, actively engaging with coffee estate management on planning mitigation activities related to elephant conflicts, and institutionalizing community participation in creating awareness, eco-tourism initiatives, and garbage management.

### 12. Bukkapatna Chinkara WLS, Karnataka (2022-23):

The PA is part of the Tumakuru forest division and was notified in 2019, covering an area of 148.45 Km<sup>2</sup>. It consists of tropical dry deciduous forests, savannah-grasslands, patches of moist forests, and riverine habitats, making it rich in medicinal plants, NTFPs, minerals, mammals, and birds. The presence of the Deccan Chinkara, Four-horned Antelope, and Blackbuck is reported to be a unique feature of the

sanctuary. In addition to its rich biodiversity, the area has a history of mining for gold, white stone, green stone, limestone, and talc stone. The sanctuary also holds high catchment value, as the Subarnamukhi river originates from these forests, and it possesses significant cultural, religious, and aesthetic values. The staff is well equipped with various mobile apps to aid in patrolling and documenting and monitoring PA attributes.

However, there are 22 proximate villages along with seasonal migrant sheep that exert high biotic pressure on the PA, leading to challenges such as heavy livestock grazing, occasional illegal tree felling, poaching, and forest fires. The management also faces issues related to inadequately trained staff, encroachments in fringe areas, and HWC. Historically, elephants moved through the area but are no longer doing so.

**Recommendations** - Recommendations include restructuring the defunct VFCs into active EDCs and building participatory programs with them to control grazing within the PA, mitigate HWC, and improve their incomes; organizing systematic wildlife management-related training for staff; enhancing habitats through improvements to grasslands, soil and moisture conservation, and fire management; improving ecological research and monitoring; monitoring wildlife health concerning communicable diseases from domestic livestock; and examining options for restoring the traditional migratory route of elephants.

### 13. Cauvery WLS, Karnataka (2022-23):

Cauvery WLS was notified in 2001 and covers an area of 1,027.53 Km<sup>2</sup>. It is an important part of the southern Karnataka-Tamil Nadu tiger and elephant landscape, connecting BRT TR to the west, Cauvery WLS to the east, and Sathyamagalam TR to the south. The river Cauvery flows through the sanctuary for about 106 Km and is home to a rich assemblage of fish, including Mahseer and rare barbs. The diversity of habitats within the PA ranges from dry tropical forests to savannah woodlands and riparian ecosystems, supporting several rare and endangered animal populations. With its scenic waterfalls, picturesque spots, and religious centers, the sanctuary attracts a large number of visitors. Good visitor facilities are maintained at various camps, primarily by Jungle Lodges and Resorts, Karnataka, as well as by EDCs. Many individuals, NGOs, and scientific institutions assist in managing human-wildlife emergencies, research, and conservation education, supported by a well-developed Advance Protection Camp network.

However, management challenges include the linear shape of the PA, the presence of about 30 enclosures within the sanctuary, conflicts with elephants and leopards, heavy livestock grazing, forest fires, inadequate coordinated actions across the landscape, a shortage of frontline staff, and delays in the release of CSS funds. Nevertheless, state plans and CAMPA funds are available for HWC-related emergencies, while District Mineral Funds support tourism-related activities.

**Recommendations** - Recommendations include utilizing the APCs as internal monitoring institutions to enhance staff capacities in recording pertinent information on PA attributes and threats, evolving a consultative and participatory management approach with enclave villages to protect PA values while improving their livelihoods, improving inter-departmental and inter-state coordination to mitigate HWCs, overgrazing, and enhancing overall protection efforts, as well as improving education and interpretation functions within the PA.

### 14. Chincholi WLS, Karnataka (2022-23):

The PA covers 134.88 Km<sup>2</sup> and was notified in 2011. It represents the Deccan Biogeographic Zone of the Central Plateau and is characterized by a highly drought-prone, rain-fed environment. The dry deciduous forests and mountainous topography provide ideal habitats for the Indian Wolf, Four-horned Antelope, and several other native wild animals and birds. The PA has high catchment value, as it feeds the Chandrampalli dam downstream through a network of streams. A total of 125 km of the PA boundary has been surveyed and consolidated, and a cattle-proof trench runs for approximately 93 km. The area also boasts excellent cultural, religious, and aesthetic values, attracting many visitors. Chettinad Cement Works and the Karnataka Regional Development Board provide CSR support to the PA.

However, there are 39 villages surrounding the PA and two located within it, exerting significant biotic pressure. The long, porous interstate border with Telangana and the absence of participatory programs with local people present serious management challenges. Additionally, there is no management plan in place, although the MEE score has improved significantly since the last assessment.

**Recommendations** - Recommendations include generating baseline information to incorporate into the upcoming management plan, strengthening participatory management by restructuring VFCs into

EDCs, building community-centric eco-tourism initiatives to help locals improve their livelihoods, engaging with local institutions for ecological research and monitoring, enhancing inter-state coordination with Telangana for improved protection efforts, and improving the skills and knowledge of staff for effective management.

### **15. Daroji Sloth Bear WLS, Karnataka (2022-23):**

The PA in Bellary district covers 55.87 Km<sup>2</sup> and was first notified in 1994. Subsequently, in 2009, an additional 26.86 Km<sup>2</sup> was added from an adjoining RF, increasing the total area of the PA to 82.72 Km<sup>2</sup>. This area features scrub forests, white rocky outcrops, boulders, caves, and crevices, and it is noted for having the highest density of Sloth Bears in the country, with an estimated 30-35 individuals per 100 Km<sup>2</sup>. The PA lies in a transitional zone between the Eastern and Western Ghats, granting it significant ecological importance. It is part of the larger Humpi landscape, which holds high historical, cultural, religious, and aesthetic values, with many prehistoric sites, including ancient forts, rock paintings, natural caves, and old temples located within its boundaries. The sanctuary has documented 479 plant species and about 100 bird species. The University of Humpi and various local NGOs support scientific studies and nature awareness programs. The field staff utilizes mobile apps such as e-prahari (for patrolling), e-parihara (for HWC monitoring), aranyabhoomi (for boundary verification), e-sasyakshetra (for tree seedling availability), and Krushaka Aranya Protsaha Yojana (KAPY) (for geotagging departmental assets).

The PA is surrounded by 24 villages, which support about 30,000 to 60,000 cattle, including migratory sheep from distant areas, exerting significant biotic pressure. HWC manifests in crop raiding by wild animals, as well as conflicts with Sloth Bears and leopards. Additionally, the PA does not have a designated Wildlife Warden and faces staff shortages, non-functional EDCs, and a lack of adequate eco-tourism and interpretation programs. There are also some reports of ritual hunting by locals during the Ugadi festival.

**Recommendations** - Recommendations include reviving non-functional EDCs to improve participatory management in controlling livestock grazing and mitigating HWC situations; continuing dialogue with local communities to replace ritual hunting with symbolic practices; improving staff numbers and

capacities; involving local NGOs, freelance photographers, naturalists, and local institutions in raising awareness and enhancing participatory management of the PA; and conducting ecological research to understand animal-habitat interactions, population monitoring, and change detection.

### **16. Ghataprabha Bird WLS, Karnataka (2022-23):**

The PA, extending over 29.8 Km<sup>2</sup>, was first notified in 1974 along a section of the Ghataprabha river and includes 22 islands in Belgaum district. The final notification was issued in 1999. The PA features Dhupadal lake, created by a dam constructed in 1883, as well as Gokak waterfall, both of which attract numerous visitors. The islands within the PA are home to a variety of swampy and tall grassy vegetation, along with plantations of species such as *Acacia arabica* and *Bambusa arundinacia*, providing habitats for several resident and winter migratory birds. The sanctuary is well connected to nearby cities and towns, and MEE scores have improved since the last assessment.

However, there are significant management weaknesses, including relatively poor biodiversity, limited staff strength, inadequate training for staff, poor protection infrastructure, the challenges posed by seasonal flooding, and livestock grazing.

**Recommendations** - Recommendations include improving staff numbers, capacities, and amenities; enhancing coordination with line departments, educational institutions, and NGOs; replacing exotic tree species with native fruit-bearing plants; increasing funds and developing eco-tourism initiatives within the PA.

### **17. Gudekote Sloth Bear WLS, Karnataka (2022-23):**

The PA, situated in Bellary district, covers 14 Km<sup>2</sup> and was established in 2013. Named after the historic Gudekote fort, which is believed to have neolithic human presence, the PA consists of two patches of dry deciduous and thorny forests and is well connected with the RFs of Bellary and Chitradurga Divisions. The sanctuary holds significant ecological, cultural, historical, and religious values, making it a popular destination for nature lovers. It supports a high density of Sloth Bears, with estimates of 22-30 individuals per 100 Km<sup>2</sup>, alongside a rich avian diversity of 132 species and a variety of reptiles. The field staff are equipped with mobile apps such as e-prahari (for patrolling), e-parihara (for HWC monitoring), aranyabhoomi (for

boundary verification), e-sasyakshetra (to check tree seedling availability), and KAPY (for geo-tagging departmental assets). MEE scores have improved since the last assessment.

However, the bouldery landscape, high summer temperatures, and low rainfall render the area vulnerable to annual fires. Additional management challenges include low prey populations, habitat water deficiency, fragmentation, and the presence of villages, particularly Shidegallu village, with livestock in the vicinity. This situation has led to severe HWC involving sloth bears and leopards, compounded by inadequate training for staff.

**Recommendations** - Recommendations include mitigating water scarcity during the dry seasons, relocating Shidegallu village and incorporating that land into the PA, improving PA interpretation and visitor management, establishing EDCs for enhanced participatory management, and initiating ecological research on the bear population.

## 18. Kamasandra WLS, Karnataka (2022-23):

The PA, representing the Eastern Ghats, was notified in 2019 and covers an area of 78.62 Km<sup>2</sup>, consisting of the only RFs in Kolar district. It is administered across two ranges and serves as a migratory corridor for elephants between Andhra Pradesh, Karnataka, and Tamil Nadu. Elephants are frequently observed throughout the year within the PA. The sanctuary features dry deciduous and scrub forests, and it is home to other wildlife species such as Sloth Bears, leopards, and Blackbucks. A management plan is in place, marking this as the first evaluation of the PA.

However, the sanctuary is located along an elephant corridor extending from southern Karnataka eastward and is experiencing human-elephant conflict. The landscape is highly fragmented, lacking adequate cross-sectoral coordination, and being a new PA, it requires appropriate protection and management infrastructure.

**Recommendations** - Recommendations include consolidating boundaries and establishing proper protection and management infrastructure; developing baseline information on the ecological and biological attributes of the PA; evaluating HWC phenomena, particularly concerning elephants, to develop effective mitigation strategies; preparing a habitat suitability model for Blackbucks; engaging NGOs and corporate entities for enhanced

management support; and developing appropriate nature interpretation facilities and programs to educate visitors and local communities.

## 19. Kappathagudda WLS, Karnataka (2022-23):

The PA extends over 244.15 Km<sup>2</sup> and was notified in 2000. The landscape is unique, comprising grasslands, mixed deciduous forests, and a riverine system. It benefits from good protection infrastructure and an adequate number of staff. There are no villages within the PA, but there are 54 VFCs surrounding it. The PA is administered by the DFO, Gadak and is managed under the provisions of the wildlife protection circle as outlined in the working plan of the Gadak division. Eight APCs are established within the PA, operating with round-the-clock wireless communication. The sanctuary conducts the Chinnavara Vana Darshan, a nature education program in association with the education department, along with street plays aimed at educating the general public. Staff members are equipped with various mobile apps to aid in management. A draft ESZ proposal was submitted in 2020.

However, there are 52 proximate villages—mostly populated by tribal communities—that rely on the PA for their subsistence. Marginal encroachments around some villages have been reported. The sanctuary faces management concerns such as forest fires, occasional tree felling, and poaching. Additionally, the area has a history of mining, with some companies applying for the diversion of parts of the PA land for gold mining; these proposals have, however, been rejected by the department. Of the eight APCs, only three are currently operational, and there is no management plan in place.

**Recommendations** - Recommendations include preparing the management plan as soon as possible and getting the ESZ notified; operationalizing all APCs; improving inter-sectoral coordination; enhancing research and monitoring efforts; replacing exotic trees with native vegetation; developing community-centric eco-tourism initiatives; and restoring mining dumps to create better habitats.

## 20. Malai Mahadeshwara WLS, Karnataka (2022-23):

Malai Mahadeshwara WLS was notified in 2013 and covers an area of approximately 90.77 Km<sup>2</sup>. It is situated between Biligiri Rangaswamy Temple (BRT) TR to the west, Cauvery WLS to the east, and Sathyamangalam TR to the south. This PA plays a crucial role in a larger

tiger and elephant landscape and is dominated by dry deciduous and savannah woodlands. After the extractive period associated with Veerappan, the sandalwood population in the area is witnessing a revival. The biodiversity of the PA has been well studied and documented, receiving scientific, infrastructural, and publicity support from several NGOs. The sanctuary has young staff members and benefits from management guidance provided by neighboring PAs.

However, there is inadequate ecological information regarding the area and no institutionalized system for monitoring. The presence of a few enclosures and a temple town within the PA, along with vehicle, people, and cattle movement, contributes to overgrazing, fires, nascent participatory arrangements, and HWCs, which pose significant management challenges.

**Recommendations** - Recommendations include establishing an institutional arrangement for scientific monitoring and systematically monitoring the elephant corridor between BRT and the Malai Mahadeshwara (MM) Hills area. It is also important to improve staff capacity, develop an inter-state strategy to control the spread of *Senna spectabilis*, a rapidly spreading weed, build participatory programs to assist local communities and the PA, and develop appropriate signage and informational materials highlighting the PA's values and management efforts.

## 21. Melkote Temple WLS, Karnataka (2022-23):

Melkote Temple WLS was notified in 2006 and spans an area of approximately 54.86 Km<sup>2</sup>. The PA is located near the famous Melkote Cheluvanarayanaswami Temple, which experiences a high volume of pilgrimage throughout the year. The sanctuary has the potential to support the rebuilding of a grey wolf population that historically existed in the area. It is surrounded by good forests, with 44 Km<sup>2</sup> of RFs from the Mandya division added to the PA. A RO headquartered at Melkote oversees the management of the PA in conjunction with Adichunchunagiri WLS and one conservation reserve, while territorial ROs manage the added areas.

Despite its significance, the grey wolf has not been sighted for many years. The sanctuary is not integrated into the larger southern Karnataka tiger landscape, which limits its financial and technical support. Additionally, most of the recommendations from the previous MEE have not been complied with.

**Recommendations** - Recommendations include improving habitats and exploring the possibility of

reintroducing Grey Wolves in the area, preparing a habitat restoration plan that replaces *Eucalyptus* areas with multi-species moist wilderness, enhancing staff capacities to systematically record and monitor PA attributes and challenges, involving shrine management, NGOs, and local communities in developing participatory pilgrimage management and education and awareness programs, and improving publicity and outreach efforts.

## 22. Thimlapura WLS, Karnataka (2022-23):

The PA is situated in Bellary district and spans 74 Km<sup>2</sup>. It was notified in 2014 and is characterized by diverse landforms, including undulating hills with dry deciduous forests, patches of grasslands, streams, and water bodies, which collectively support a rich assemblage of plants and animals. A checklist of major animal and plant species has been compiled for the area. The presence of three perennial streams enhances the hydrological value of the otherwise semi-arid region. Additionally, the PA holds high cultural-religious significance and geomorphological value, highlighted by Madhugiri Rock, the world's second-largest single monolith stone hill. The scenic beauty of the PA attracts a large number of visitors. The staff has been equipped with mobile apps such as e-prahari and e-parihara to aid in protection and monitoring efforts.

However, there are 24 villages surrounding the PA, housing about 30,000 cattle, which exert significant biotic pressure on the area. Challenges to management include frequent forest fires, inadequately trained wildlife staff, insufficient outreach and publicity, and a lack of ecological research and monitoring.

**Recommendations** - Recommendations include managing forest fires more effectively, establishing a wildlife health monitoring protocol to protect wild animals from livestock-related diseases, organizing systematic wildlife training for staff, establishing EDCs and developing participatory programs such as eco-tourism to enhance local incomes, improving basic tourism amenities, enhancing PA outreach, publicity, and interpretation programs, intensifying soil and moisture conservation initiatives, and undertaking systematic ecological research and monitoring programs in collaboration with local institutions.

## 23. Pushpagiri WLS, Karnataka (2023-24):

Extending over 102 Km<sup>2</sup>, the PA was notified in 1994. Contiguous with Thalakaveri and Brahmagiri WLSs, the PA also provides important corridor between Bhadra

TR and Mysuru ER. Located in the Western Ghats, the PA consists of tropical evergreen, semi-evergreen forests and Shola- grasslands complex, and has significant biodiversity, hydrological and aesthetic values. It has one of the highest peaks of the state, namely, Pushpagiri/Kumara Parvatha (1712 m). The PA is well protected, has an approved management plan, and ESZ is notified. The management is supported by a number of local NGOs.

However, an enclosure of 314 acres has rights of cultivation given to 9 families, and grazing pressure by domestic livestock of eight proximate villages is experienced along the periphery of the PA. The PA lacks participatory programmes, EDCs, an interpretation centre and need based management research and monitoring. The staff is also not adequately trained in wildlife management.

**Recommendations** – Recommendations include development of community-based eco-development programmes, including eco-tourism; engagement with institutions and NGOs on implementing need based research and monitoring; updation of zonation maps; making the buffer zone coterminous with the ESZ; special attention on the inventory and protection of endemic species; periodic population estimation of major mammals; establishment of a nature interpretation centre and improved education and awareness activities; weed control and examination of availability of CSR funds from coffee planters and local industries.

#### 24. Ramadevara Betta Vulture WLS, Karnataka (2023-24):

Located in Ramnagara district with eight distinct peaks, the PA extends over 346.42 ha with an ESZ of 756.19 ha surrounding it and was notified in 2012. Covered in Tropical Thorn Scrub and deciduous forests, the hilly landscape with its cliffs and ledges harbours three species of vultures, namely Long-Billed, Egyptian and White-Backed. Sloth Bears, leopards, Wild Dogs, Cheetals, etc. have also been reported from this sanctuary. The river Arkavathi, which is a tributary of the Cauvery, flows through the PA. Located on the Bengaluru-Mysuru highway, it has a well-kept information centre, a telescope facility for bird watching, an approved management plan and regulated entry to the pilgrim centres.

The PA is surrounded by a human- and agriculture-dominated landscape and several religious sites, including the famous Sree Pattabhi Rama temple on a 3800 feet high peak within, resulting in high human

movement in and around the PA. The low population of the Long-Billed Vulture, inadequate eco-development activities, inadequate community participation, *Lantana* and *Hyptis* infestations; inadequate management-based research and monitoring and financial constraints are some of the other weaknesses reported in the PA.

**Recommendations**- Recommendations include a mid-term review of the management plan in context of ecological connectivity and climate change; engagement with local community for PA protection, monitoring and pilgrimage and eco-tourism management; updation of zonation maps; systematic weed removal; conducting need-based research and monitoring; camera trap monitoring of nesting/roosting activities of the flagship species; improvement of information centre, signage and other interpretation material; exploring alternative financing through CSR funds; and exposure visit of the staff to the Vulture Conservation and Breeding Centre, Pinjore, Haryana for acquainting them with good management practices.

#### 25. Ranebennur (Blackbuck) WLS, Karnataka (2023-24):

Representing Southern Thorn Open Forests, the 119 Km<sup>2</sup> PA was established in 1974 and has a large population of Blackbuck (about 7000 heads). Once a favoured habitat of the GIB, the PA has an approved management plan and the ESZ was notified in 2017. There are scattered patches of *Eucalyptus*, raised in the past. The PA management actively collaborates with industry, academic institutions and NGOs. Grasim industries is helping through its CSR funds. There is a nature camp with visitors' facilities at Gangajal and the management conducts periodic Chinnara Vanadarshana, a nature awareness programme.

However, the surrounding villages of Kurumba and Lambani communities exert grazing and resource extraction pressures on the PA. It is also surrounded by several religious sites, visited regularly by pilgrims. The last sighting of GIB was reported in 1997. The PA also suffers from heavy growth of *Lantana* and *Eupatorium*, poor participation of local communities in the management, inadequate information on biodiversity, absence of population estimation (the last Blackbuck census was conducted in 2015), and inadequate protection and interpretation infrastructure.

**Recommendations** – Recommendations include systematic engagement with local communities and revival of EDCs; strengthening of collaboration with

NGOs for improved habitat management, monitoring and eco-tourism; exploring the possibility of reintroduction of the GIB; expeditious removal of *Eucalyptus* and development of grasslands; updation of zonation maps; improvement of protection infrastructure; improvement of nature interpretation centre at nature camp, Gangajal; conducting regular census of Blackbuck and other species; and immunization of cattle in the proximate villages.

## **26. Ranganathittu Bird Sanctuary, Karnataka (2023-24):**

An old sanctuary of the princely state of Mysuru, the 0.67 Km<sup>2</sup> PA, surrounded by an ESZ of 28.04 Km<sup>2</sup> was notified in 1998. The PA is an assemblage of six islands and several islets on the river Cauvery, which came up due to the construction of an embankment by the then Mysuru ruler. An IBA and a Ramsar site, the PA has tropical moist deciduous, tropical thorn and riverine forests with about 221 bird species and about 20 heronries. It has an approved management plan and systematically monitors bird populations regularly. An interactive Dr. Salim Ali Nature Interpretation Centre, along with excellent visitors' facilities is visited by a large number of students and tourists.

High rainfall and periodic release of water from Krishnarajasagar dam pose serious erosion problems to the islands. The PA suffers from limited community participation, unavailability of land for further development of the eco-tourism infrastructure, inadequate research and monitoring and fund constraints.

**Recommendations** – Recommendations include a mid-term review of the management plan in context of ecological connectivity and climate change; engagement with local community for PA protection, monitoring and eco-tourism management; upscaling of bund stabilization and erosion control using geotextile technology; tapping CSR funds from Bengaluru and Mysuru; improvement of boating facilities; and strengthening of management-based research and monitoring.

## **27. Rangayyanadurga Four-horned Antelope WLS, Karnataka (2023-24):**

The only Four-Horned Antelope sanctuary in Karnataka, the 77.24 Km<sup>2</sup> PA is situated in the Davangere district and was notified on 10 January 2011. Representing the Southern Peninsular Dry Deciduous and Thorny Scrub, the PA also has leopard, Sloth Bear, Indian Grey Wolf, Pangolin, Palm Squirrel,

Porcupine etc., in addition to several birds, herpetofauna and plants, many of them are endemic. Administered by the DCF, Davangere with staff adequately trained and deployed, and Cattle Proof Trench (CPT) and solar fenced boundary. ESZ was notified in 2017 and approved management plan in place. Staff is provided with free ration in all the six APCs. Funds also come from Bhadra TR Foundation.

The local peoples' resistance against the establishment of the PA has reportedly ebbed now and they are gainfully employed in the management. Low levels of PA use and encroachment by local people continue. Sri Madralli Chowdamma Temple, located within the PA attracts large number of devotees. The sanctuary exists in three adjacent but disjunctive blocks with enclaves in the intervening areas. Inadequate baseline information on PA values, absence of systematic eco-development and EDCs, absence of interpretation facilities, inadequate funds and vulnerability to fire compound the management problems.

**Recommendations** - Recommendations include upgrading the PA from range level to sub-divisional level; strengthening protection infrastructure and staff amenities and equipment; filling up of the vacant posts of frontline staff and training them in wildlife management; improving communication systems; notification of various zones; population estimation of Four-Horned Antelope urgently and documentation of PA values; systematic weed removal and grassland development; hastening the process of acquisition of 90 acres of private land for PA consolidation; implementation of eco-development programmes through EDCs; implementing community-centric eco-tourism plan; partnering temple authorities in pilgrim management; and engaging with district administration on local peoples' development needs.

## **28. Sharavathi Valley Lion-Tailed Macaque WLS, Karnataka (2023-24):**

Created on 28 June 1978 with an area of 431.23 Km<sup>2</sup>, of which 123.63 Km<sup>2</sup> is the backwater of Linganamakki reservoir, the PA was extended and finally notified over 930.16 Km<sup>2</sup> on 7 June 2019. Extending across Shivamogga and Uttara Kannada district, the PA is managed under two forest divisions and the Sharavathi WLS as independent units. Forming catchments of the rivers Sharavathi and Aghanashini, 67% of the area is covered with evergreen, semi-evergreen, moist deciduous and Shola forests and the rest with grasslands, *Myristica* swamps, plantations and their associated fauna. The reservoir has several biodiversity

rich islands. Connected with Mookambika WLS, the fauna of the sanctuary includes 84 species of ant, 173 of butterfly, 24 of amphibian, 60 of fish, 122 of bird, 23 of reptile and 43 species of mammal. Some Village Forest Protection Committees VFCs/NGOs participate in nature education, awareness programmes, patrolling, fire management, intelligence gathering, man-animal conflict resolution etc. Protection infrastructure, staff capabilities and equipments are adequate.

There are about 49 villages inside and 56 around the notified PA, and in the absence of surveyed and demarcated boundaries, the PA remains exposed to protection problems, encroachment, forest theft, grazing, HWC and fires. The staff vacancies, inadequacy of APCs, non-functional EDCs, restrictions on eviction, and untimely inadequate funding compound management problems.

**Recommendations** - The important recommendations include implementation of a single management plan across the three units with a centralized administration; survey, demarcation and consolidation of the boundary as per the notification; improving protection infrastructure and staff capabilities, amenities and deployment; replacing exotic plantations with indigenous trees; activating EDCs and building participatory eco-tourism; effective mitigation of HWC; insulating electric lines passing through the PA; develop need based research and monitoring; paying closer attention to Myristica Swamps; strengthen veterinary care.

## 29. Shettihalli WLS, Karnataka (2023-24):

Lying in the Central Western Ghats in the Shivamogga and Shimoga districts, the 395.60 Km<sup>2</sup> PA was notified in 1974 with final notification issued on 25 January 1977. Administered under Shivamogga Wildlife Division, it is covered by the Southern Tropical Dry Deciduous, Moist Deciduous, Semi-evergreen and Evergreen forests. There are about 269 woody plant species, of which 104 are listed in the IUCN Red List. In addition to elephant, Bison, Spotted Deer, leopard and Wild Dog, two tigers were also reported. A total of 259 birds, 37 reptiles, 16 fish, 40 amphibians, and 151 butterfly species have also been reported. The sanctuary is traversed by two rivers, and encloses Sakkarebylu Elephant Camp, Mandagadde Bird Sanctuary and Thyavarekoppa Tiger and Lion Safari. Field staff is trained in the use of GPS, E-Gastu, camera traps, arms etc. It is well protected and has good protection and interpretation infrastructure.

Three irrigation dams, two; now closed, manganese ore

mines and a few prominent temples are located within the PA. Approximately 70 villages are located within the PA, and another 30 around it. Hamlets and agricultural lands are scattered throughout the sanctuary. From 1959 to 1963, displaced persons from the Sharavathi Valley Hydro Electric Project were settled over 2250 acres of forest land and there is significant pressure to denotify this area. Proper survey and demarcation of boundaries is pending. Staff vacancies of 35% and proliferation of weeds pose additional challenges.

**Recommendations** - Recommendations for Shettihalli WLS include controlling invasive species like *Lantana camara* and *Chromolaena odorata* through regular monitoring and developing a zonation map. Utilizing census data for population monitoring of leopards and ungulates is critical, along with expanding research activities and creating a monitoring framework. Infrastructure development should focus on establishing more APCs and watchtowers while providing staff quarters for elephant mahouts. Resources must be allocated to reduce human presence in sensitive areas and enhance community involvement through EDCs for livelihood support. Promoting tourism activities such as safaris and bird-watching trails is essential, with CAMPA funds used to support these efforts. Additionally, addressing eco-friendly practices, improving staffing and capacity building, and engaging in conflict zone identification are vital for better sanctuary management.

## 30. Someshwara WLS, Karnataka (2023-24):

Someshwara WLS covers an area of approximately 95.48 Km<sup>2</sup> and is located in the Udupi district of Karnataka. Initially notified in 1974, the final notification was issued on October 12, 1979. The sanctuary represents the picturesque Western Ghats and connects Mookambika WLS and Kudremukh NP. Known as the "Land of Primates" and designated as an IBA, the PA is characterized by low evergreen and semi-evergreen forests that exhibit a high degree of plant and animal endemism. It is home to various arboreal and terrestrial mammals, birds, reptiles, and amphibians. The WLS is the source of the Seethanadhi and Varahi rivers, which support the lives and culture of numerous villages downstream. The Agumbe Ghats, located in the southeastern part of the sanctuary, is the highest point at an elevation of 825 m. Adequate protection infrastructure is in place, with staff trained in using modern technology. Local communities are

organized into EDCs and actively participate in eco-tourism, pilgrimage management, and the protection of the PA. A management plan is in place, supported by the Bhadra TR Foundation.

However, the PA faces several management challenges, including inadequate research and monitoring, a shortage of permanent staff and funds, occasional failures of modern gadgets deep within the forests, insufficient documentation of flagship species, developmental pressures in enclosures and surrounding areas, and the absence of an interpretation center and educational materials.

**Recommendations** - Recommendations include conducting systematic research, monitoring, and documentation of critically endangered species; strengthening community-centric eco-tourism and eco-development initiatives; filling staff vacancies and creating additional posts as provided in the management plan; notifying various zones within the PA; enhancing the communication system; controlling invasive species; facilitating the voluntary relocation of enclaves and settlements; improving inter-sectoral coordination and staff welfare; and CSR funding opportunities.

### **31. Talakaveri WLS, Karnataka (2023-24):**

Considered to be the source of the river Cauvery, the PA with an extent of 105 Km<sup>2</sup> was notified in 1994. Managed under Madikeri wildlife division, the PA, along with Pushpagiri and Brahmagiri WLSs, provides important corridor between Bhadra TR and Mysuru ER. Located in the Western Ghats, the PA consists of tropical evergreen, semi-evergreen forests and Shola-grasslands complex, and has significant biodiversity, hydrological, religious and aesthetic values. The PA is well protected, has an approved management plan and is buffered by good RFs. The ESZ was notified in 2017. The eco-tourism activities, including adventure trekking, and nature education programmes are organised and regulated well.

However, of the eight enclaves within the PA, one enclosure of 42 acres has rights of cultivation given to 15 families. The periphery of the PA experiences some grazing pressure by domestic livestock. The PA lacks participatory programmes and EDCs, an interpretation centre and there are 65% vacancies of the frontline staff. The staff is also not adequately trained in wildlife management.

**Recommendations** - Recommendations include

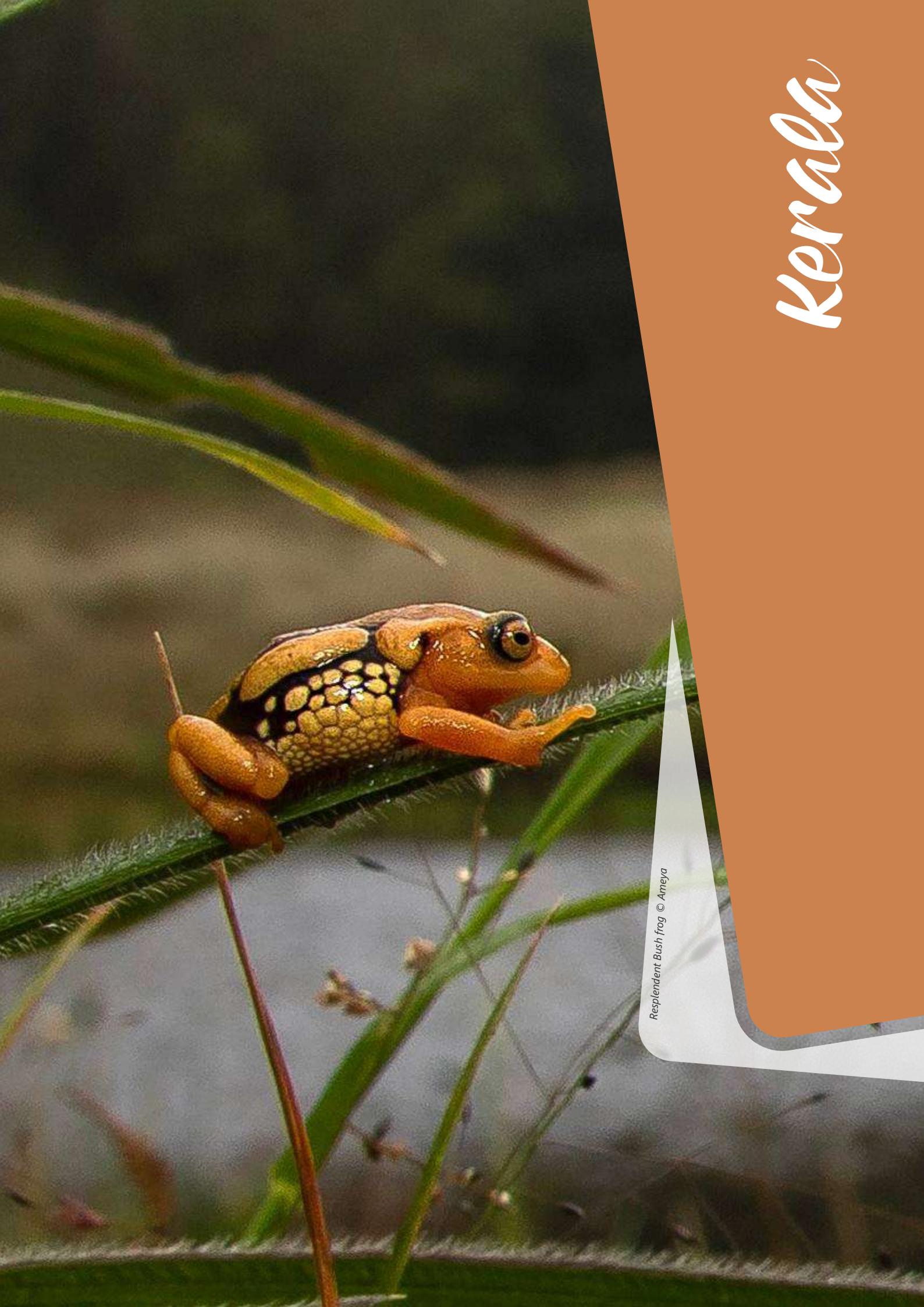
development of community-based eco-development programmes, including eco-tourism; engagement with institutions and NGOs on implementing need based research and monitoring; updation of zonation maps; considering making the buffer zone co-terminous with the ESZ; special attention on the inventory and protection of endemic species; periodic population estimation of major mammals; establishment of a nature interpretation centre and improved education and awareness activities; weed control; immunization of cattle of the proximate villages; and examination of availability of CSR funds from coffee planters and local industries.

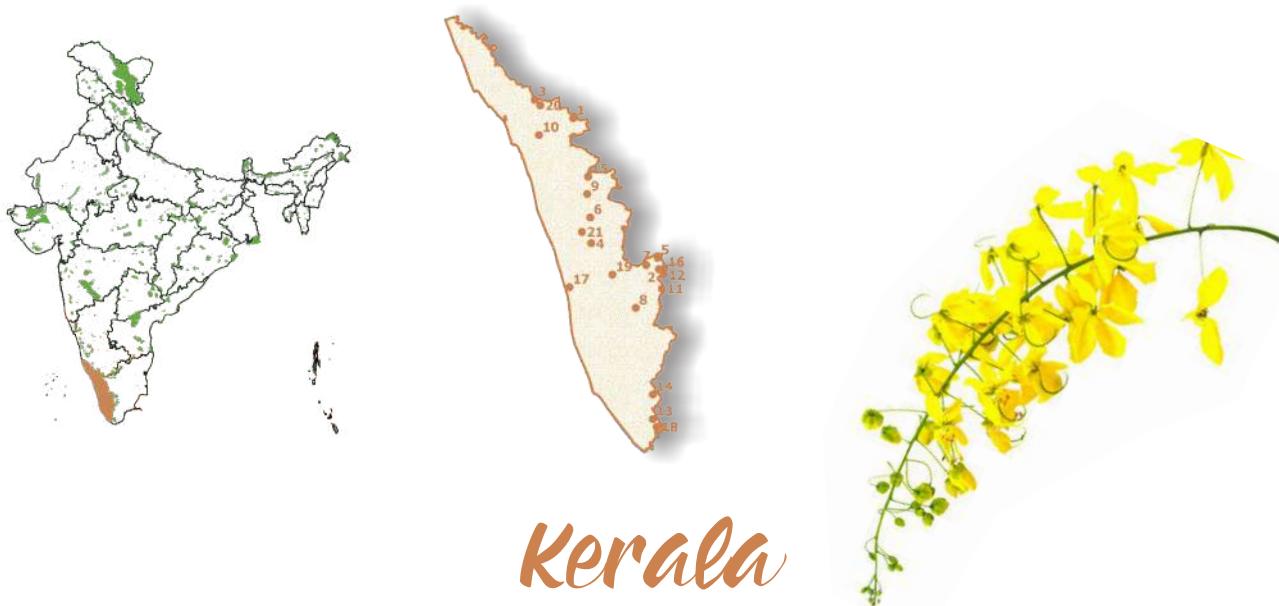
## Trend of MEE scores between first and repeat cycles

Sl. No	PAs	First Cycle			Repeat Cycle			Trend
		Phase	MEE Score (%)	Category	Evaluation Year	MEE Score (%)	Category	
1	Bhimgad WLS	2015-2017	80	Very Good	2020-2022	76.56	Very Good	▼
2	Gudavi Bird WLS	2015-2017	70	Good	2020-2022	67.97	Good	▼
3	Jogimatti WLS	-	-	-	2020-2022	72.66	Good	-
4	Kudremukh NP	2012-2013	64.17	Good	2020-2022	82.03	Very Good	▲
5	Mookambika WLS	2006-2009	64.4	Good	2020-2022	82.81	Very Good	▲
6	Yadahalli Chinkara WLS	-	-	-	2020-2022	70.16	Good	-
7	Adichunchanagiri Peacock WLS	2017-2018	35	Poor	2022-2023	42.19	Fair	▲
8	Arabithittu WLS	2017-2018	51.79	Fair	2022-2023	60	Good	▲
9	Attiveri Bird WLS	2017-2018	63.33	Good	2022-2023	86.72	Very Good	▲
10	Bannerghatta NP	2015-2017	72.5	Good	2022-2023	75.78	Very Good	▲
11	Brahmagiri WLS	2017-2018	90	Very Good	2022-2023	78.23	Very Good	▼
12	Bukkapatna Chinkara WLS	-	-	-	2022-2023	73.44	Good	-
13	Cauvery WLS	2015-2017	79.17	Very Good	2022-2023	89.06	Very Good	▲
14	Chincholi WLS	2017-2018	69.17	Good	2022-2023	86.72	Very Good	▲
15	Daroji Sloth Bear WLS	2017-2018	55	Fair	2022-2023	90.63	Very Good	▲
16	Ghataprabha Bird WLS	2017-2018	40.83	Fair	2022-2023	73.44	Good	▲
17	Gudekote Sloth Bear WLS	2017-2018	60.83	Good	2022-2023	72.66	Good	▲
18	Kamasandra WLS	-	-	-	2022-2023	56.25	Fair	-
19	Kappathagudda WLS	-	-	-	2022-2023	85.94	Very Good	-
20	Malai Mahadeshwara WLS	2017-2018	62.5	Good	2022-2023	71.09	Good	▲
21	Melkote Temple WLS	2017-2018	56.67	Fair	2022-2023	60.94	Good	▲
22	Thimlapura WLS	-	-	-	2022-2023	80.47	Very Good	-
23	Pushpagiri WLS	2018-2019	69.17	Good	2023-2024	74.22	Good	▲
24	Ramadevara Betta Vulture WLS	2018-2019	62.93	Good	2023-2024	67.19	Good	▲
25	Ranebennur (Blackbuck) WLS	2018-2019	60	Good	2023-2024	66.41	Good	▲
26	Ranganathittu Bird WLS	2018-2019	69.17	Good	2023-2024	86.72	Very Good	▲
27	Rangayyanadurga Four-horned Antelope WLS	2018-2019	61.67	Good	2023-2024	65.63	Good	▲
28	Sharavathi Valley LTM WLS	2018-2019	75.83	Very Good	2023-2024	84.38	Very Good	▲
29	Shettihalli WLS	2018-2019	62.5	Good	2023-2024	67.97	Good	▲
30	Someshwara WLS	2018-2019	80	Very Good	2023-2024	79.69	Very Good	▼
31	Talakaveri WLS	2018-2019	69.17	Good	2023-2024	73.44	Good	▲
32	Biligiri Rangaswamy Temple WLS	2009-2010	79.69	Very Good	-	TR	-	-
33	Dandeli WLS	2006-2009	60.6	Good	-	TR	-	-

Kerala

Resplendent Bush frog © Ananya





## Kerala

Kerala is located in the southern part of India with an area of 38,852 Km<sup>2</sup>. The state's forest cover is 22,059.36 Km<sup>2</sup>, which is 56.78% of its total area (ISFR 2023). In the first cycle of MEE, a total of 20 PAs were assessed and in the repeat cycle 21 PAs were assessed. In the repeat cycle, 1 new PA was evaluated.

### 1. Wayanad WLS, Kerala (2018-19):

Wayanad WLS was notified in 1994 and covers an area of approximately 344.44 Km<sup>2</sup>. This PA represents an ecological continuum with the major wildlife habitats of the Western Ghats in Karnataka and Tamil Nadu, including the Nilgiri Biosphere Reserve. It boasts a rich diversity of animals and plants, many of which are endemic. The sanctuary is known for hosting one of the largest populations of elephants in India, along with a viable population of tigers and their associates.

However, the PA contains 67 tribal enclosures and several settlements on its fringes, leading to management challenges in a human-dominated landscape with a significant number of cattle. This environment contributes to ongoing HWC. Additionally, only five out of the 16 EDCs established in the past are functioning effectively, negatively impacting community engagement.

**Recommendations** - Recommendations include relocating the 67 tribal enclosures outside the PA, controlling the spread of the invasive weed *Senna spectabilis*, integrating the Chedaleth Range of the South Wayanad Division with the PA to secure the elephant corridor, strengthening eco-development

programs, reviving the defunct EDCs, controlling illegal encroachments, and implementing measures to mitigate HWC.

### 2. Anamudi Shola NP, Kerala (2022-23):

Anamudi Shola NP was notified in 2006 and spans an area of 32.85 Km<sup>2</sup>. This PA represents the Shola-grassland biomes in the high ranges of the southern Western Ghats and serves as a repository for highly endangered and endemic flora and fauna, all of which are well documented. It is well connected to neighboring PAs and RFs, facilitating the movement of wild animals between Kanan Devan Hills and Palani Hills. The PA is part of the High Range Circle Landscape Conservation Unit, which includes several PAs under the Anamudi ER. It provides high-altitude camping facilities for visitors, efficiently managed by local EDCs. Additionally, it serves as a good example of eco-restoration, with successful replacement of wattle plantation areas by grasslands. The sanctuary has adequate staff numbers and amenities and is managed by the Munnar Wildlife Division, with a management plan in place.

However, the PA is facing increased pressure from road traffic along the route from Mannavan Shola to Kanthalur, and compliance with previous MEE

recommendations has been only partial.

**Recommendations** - Recommendations include expanding nature education and interpretation programs, establishing regular monitoring of eco-restoration plots and the Shola-grassland ecosystem, and implementing measures to protect the area from weed invasion.

### 3. Aralam WLS, Kerala (2022-23):

Aralam WLS, the northernmost PA of Kerala, spans 55 Km<sup>2</sup> and was notified in 1984. It is ecologically connected to Brahmagiri WLS in Karnataka to the north and Wayanad TR to the east. The sanctuary is unique in providing habitats for five species of primates within its boundaries. A well-documented biological information base and participatory nature education programs enhance the sanctuary's value. It is also known as a popular butterfly site, with a departmental biologist working to improve the outreach functions of the PA. There are no human settlements within the sanctuary, and a proposal for an ESZ has been submitted to the State Government.

However, the adjacent Aralam Farm, operated by the Farm Corporation to the west of the PA, presents conflict particularly related to tribal, labor, and wildlife interactions. The sanctuary suffers from inadequate staff strength, and compliance with previous recommendations has been insufficient.

**Recommendations** - Recommendations include establishing an outreach program that promotes the PA as a premier location for butterfly conservation in the wild, engaging with the administration and communities of Aralam Farm to mitigate HWCs, actively involving EDCs in eco-tourism activities to provide socio-economic benefits, promptly filling all vacancies and improving protection infrastructure, and making proper protection arrangements for Kottiyoor WLS.

### 4. Chimmony WLS, Kerala (2022-23):

The PA lies at the western end of the Anamudi (Eravikulam NP)-Anamalai (Anamalai TR and Parambikulam TR) Conservation Unit and spans 85 Km<sup>2</sup>. Together with Peechi-Vazhani WLS, which covers 125 Km<sup>2</sup>, this area represents an important ecological entity with a diverse range of flora and fauna, many of which are endemic, endangered, and rare. The PA was notified in 1984 and serves as a catchment for the Chimmony Dam, providing drinking water to the city of Thrissur. It is well protected, featuring seven APCs, and benefits from active participation of EDCs in its management. The rights of tribal people living within the PA have been settled, and a draft management plan is in place.

However, the PA faces financial constraints due to inadequate funding and delayed fund releases, while ecological monitoring is insufficient. Additionally, the presence of feral buffaloes within the PA poses management challenges.

**Recommendations** - Recommendations include removing feral buffaloes from the PA, involving KFRI for biological and ecological studies and monitoring programs, eradicating *Xanthium* weed from the grasslands, and training EDC members on sustainable harvesting and marketing of NTFPs.

### 5. Chinnar WLS, Kerala (2022-23):

The PA spans 90 Km<sup>2</sup> and was notified in 1984. It slopes eastwards from the high ranges and exhibits a diverse range of habitats, from high-altitude Shola-grasslands to dry, semi-arid scrub vegetation near the eastern plains. The riverine habitats in the drier areas provide an ideal environment for the Grizzled Giant Squirrel. Ecologically, the PA is well connected and contains valuable resources, including Sandal trees and the Indian Star Tortoise. The management has built excellent rapport with local tribal communities by engaging them in PA protection, eco-tourism, and livelihood improvement activities through well-formulated EDCs, which also support the conservation of ethnic millets, beans, and other crops. Furthermore, there is a rehabilitation center for Star Tortoises, and the PA generates good revenue from eco-tourism for both the EDCs and management. The sanctuary has established good protection infrastructure.

However, the Munnar-Udumalpet state highway bisects the sanctuary into two parts. Its location along the Tamil Nadu border and the presence of high-value Sandal trees increase vulnerabilities related to protection. Additionally, the absence of monitoring for released Star Tortoises and long-term ecological studies, particularly concerning the Grizzled Giant Squirrel and its habitat, weaken management effectiveness.

**Recommendations** - Recommendations include establishing long-term monitoring processes for the Grizzled Giant Squirrel and the released Star Tortoises, as well as setting up monitoring plots for long-term studies on habitat and climate changes.

### 6. Chulannur Peafowl WLS, Kerala (2022-23):

The PA extends to 3.42 Km<sup>2</sup> and was notified in 2007. It is managed under the Peechi Wildlife Division exclusively for the protection of peafowl. Consisting of deciduous open forests with rocky patches, the area supports a good population of peafowl, and there are no human settlements within the PA. The sanctuary



Little Spiderhunter on Thunbergia © Uddalak

features several archaeological sites and offers good facilities for nature education and awareness programs. A management plan is in place.

The PA comprises erstwhile private forests, leading to a conflicting relationship between local people and management regarding resource use. EDCs are not functional, and funding is limited.

**Recommendations** - Recommendations include taking a proactive approach to seek legal resolutions for ongoing litigation concerning the creation and management of the PA, engaging proactively with nearby communities to build better relationships, improving the assessment process for crop loss caused by peafowl, implementing effective habitat improvement programs, initiating nature education and awareness initiatives, conducting a study on the population dynamics and habitat utilization of peafowl, and sourcing financial support from the Forest Development Agency (FDA) to activate eco-development programs.

## 7. Eravikulam NP, Kerala (2022-23):

The PA spans 97 Km<sup>2</sup> and represents one of the largest contiguous Shola-grassland biomes in the high ranges of the southern Western Ghats. It is an important unit within a large ecologically significant landscape, connecting several PAs and RFs across Kerala and Tamil Nadu. This unique tropical montane ecosystem has well-documented and extensive checklists of local flora and fauna. It is home to one of the last remaining populations of the Nilgiri Tahr as well as about 20 species of Strobilanthes, including the renowned Neelakurinji (*Strobilanthes kunthianus*), which flowers once every 12 years. Administered under the Munnar Wildlife Division, the PA is also part of the Anamudi ER. Known as one of the cleanest NPs, it features an excellent community-driven eco-tourism program where local people regulate and control tourist movement, generating revenue for themselves and the PA. The staff are well-trained, motivated, and a management plan is in place. EDCs are very active and take pride in their management role, while the



presence of a well-demarcated and regulated tourism zone, an interpretation center, and an orchidarium enriches the nature interpretation value of the PA. Coordination with Tata Tea, which provides protection support to the PA, is also commendable.

However, a road runs through the tourism area of the PA, utilized by the local Panchayat and Tata Tea workers, which disrupts the tranquility of the PA. Compliance with previous MEE recommendations has been partial.

**Recommendations** - Recommendations include examining the possibility of realigning the road that passes through the PA to reduce disturbances caused by vehicles belonging to the local Panchayat and Tata Tea. Other recommendations may involve enhancing eco-tourism facilities, increasing staff capacities, and further engaging with local communities for sustained conservation efforts.

## 8. Idukki WLS, Kerala (2022-23):

The PA extends over 105.36 Km<sup>2</sup>, including about 33 Km<sup>2</sup> of water spread area from the Idukki arch dam, the highest in Asia. It is part of the Anamudi ER and is isolated from the Munnar Hills that stretch to Periyar TR. This isolation occurred due to the presence of habitations, developments, and habitat destruction resulting from the construction of the Idukki Dam. A checklist of the flora and fauna of the PA is available, and a management plan is in place. The sanctuary is well protected on three sides by the Idukki River and features strategically located anti-poaching camps. Technology-driven patrolling occurs both on land and in the water. EDCs are active, and local communities are supportive of management efforts, with low-intensity HWC reported.

However, there are 12 villages within the PA, which support a historical presence of feral cattle, exerting biotic pressure on the area. Management effectiveness is weakened by inadequate monitoring of habitats and species, insufficient support from NGOs, and a lack of publicity and availability of information.

**Recommendations** - Recommendations include expediting the addition of adjoining areas from the Kottayam Division to the PA, improving eco-tourism facilities and incorporating activities such as bamboo rafting into the program offerings, establishing a nature interpretation center at Vellapara, removing exotic and invasive species from the PA, and soliciting support from scientific institutions, NGOs, and local conservationists for ecological monitoring and awareness generation.

## 9. Karimpuzha WLS, Kerala (2022-23):

The PA, extending over 228 Km<sup>2</sup>, was notified in 2020 and was once part of the famous Nilambur Division. It serves as an important ecological unit within a large wet evergreen and tropical montane biome, connecting to Mukurti NP in the north and Silent Valley NP in the south, as well as with RFs to the east and west. The PA is traditionally home to one of the most primitive tribes of India, the Cholanayake, with altitudes varying from 400 m to 2,654 m, providing habitats for a wide range of native flora and fauna. The River Karimpuzha flows through the PA, and the management organizes monthly tribal interaction meetings involving local bodies, government departments, and other stakeholders. A draft management plan and ESZ notification have been submitted to the government.

However, there is minimal involvement of scientific institutions and other organizations in generating information and awareness. The area faces challenges such as unregulated extraction of NTFPs by tribal communities, pending FRA settlements for the



Brown Wood- Owl © Abhijith S.

Mancheeri tribal colony, and a lack of community-centric eco-tourism initiatives.

**Recommendations** - Recommendations include preparing a conservation plan for Mahseer, strengthening EDCs by training them in the sustainable harvesting and marketing of NTFPs, and developing eco-tourism initiatives to enhance their incomes. Additionally, improving staff mobility within the PA is essential, and settling the rights of the Mancheeri colony under FRA should be prioritized at the earliest.

### 10. Malabar WLS, Kerala (2022-23):

The PA, covering 74 Km<sup>2</sup>, is part of the Nilgiri Biosphere Reserve and Wayanad ER. It serves as the catchment for Kakkayam Dam, which provides drinking water to the city of Kozhikode. The PA was notified in 2009 and is notable for its high degree of endemism, housing many rare and endangered species, and it has a significant baseline of biological information. There are no villages within the PA.

Nonetheless, the sanctuary faces management challenges, including the proliferation of invasive species, particularly fish, in the reservoir, inadequate protection infrastructure, insufficient ecological information on endemic species, and a lack of arrangements for eco-tourism and nature education.

**Recommendations** - Recommendations include preparing conservation plans for the Reed Frog and Mahseer (*Tor khudree*), maintaining close vigilance on areas leased to the Kerala Plantation Corporation to prevent unwanted activities, improving liaison with the Kerala Electricity Board, and actively engaging with stakeholders to secure the elephant corridor and

mitigate conflict situations.

### 11. Mathikettan Shola NP, Kerala (2022-23):

The PA extends to 12.82 Km<sup>2</sup> and represents the tropical montane shola-grassland biome. It was notified in 2003 and is administered under the Munnar Wildlife Division. The PA is an important part of an elephant corridor and is the only known habitat of the unique Galaxy Frog, providing a perennial supply of water to local communities. An ESZ has been notified, and the PA is free from significant biotic pressures. The management has developed a successful participatory eco-tourism program that generates revenue for both the local population and the PA.

While the area still has remnants of coffee plantations, their removal is occurring at a slow pace. There is very little information available on the Galaxy Frog, and systematic ecological monitoring is not currently in place.

**Recommendations** - Recommendations include improving the protection of the elephant corridor, establishing a systematic monitoring program for key species in collaboration with scientific and educational institutions, and launching a conservation program specifically for the Galaxy Frog.

### 12. Pambadum Shola NP, Kerala (2022-23):

The smallest NP in Kerala, the PA extends to 11.69 Km<sup>2</sup> and represents the Shola-grassland biomes in the high ranges of the southern Western Ghats. It serves as a repository for highly endangered and endemic flora and fauna, which are well documented. The PA is well connected to neighboring PAs and RFs, linking the Kanan Devan Hills to the Palani Hills. It is part of the

High Range Circle Landscape Conservation Unit, which includes several PAs within the Anamudi ER. Being a relatively compact sanctuary, it has no human settlements inside, and it offers excellent nature education and interpretation facilities. The park creatively engages nature camp participants in management activities, such as eco-restoration. Managed by the Munnar Wildlife Division, the PA has active EDCs and a management plan in place.

However, the road passing through the PA has been getting busier over the years, with an increasing volume of traffic.

**Recommendations** - Recommendations include improving coordination with the FD of Tamil Nadu for effective protection and management of the area, and removing weeds from the eco-restored plots to enhance habitat quality.

### 13. Peppara WLS, Kerala (2022-23):

Peppara WLS was notified in 1991. It is located in the southernmost part of the Western Ghats and encompasses an area of 53 Km<sup>2</sup>, including 5.82 Km<sup>2</sup> of water spread from the Peppara reservoir. It is home to a diverse array of rare, threatened, and endemic species of plants and animals of conservation importance, all of which have been well documented. The sanctuary is well protected and abuts the Kalakkad-Mundanthurai TR, forming part of the core area of the Agasthyamalai Biosphere Reserve and the Periyar ER. It holds significant catchment, religio-cultural, and aesthetic values. A management plan is in place, and EDCs are actively engaged in livelihood improvement programs and PA protection.

However, the sanctuary faces several challenges, including inadequate regular wildlife training for staff, insufficient publicity and outreach programs, limited mobility, a progressively increasing number of pilgrims visiting Agasthyamalai Hill, a non-functional interpretation center, and inadequate funds for maintenance of assets, as well as for research and monitoring.

**Recommendations** - Recommendations include improving staff mobility and providing regular wildlife training; enhancing publicity and outreach programs; making the interpretation center functional; ensuring the timely release of funds; and developing a dedicated website for the PA to enhance awareness and information dissemination.

### 14. Shendurney WLS, Kerala (2022-23):

The PA was notified in 2004 and extends to 173.64 Km<sup>2</sup> in the Kollam district, including 18.69 Km<sup>2</sup> of water spread area and 5.68 Km<sup>2</sup> of private estates. Located in

the Agasthyamalai-Ashambu hills of the southern Western Ghats, south of the Aryankavu Pass, the PA is named after the endemic tree *Gluta travancorica*. It is part of the Agasthyamalai Biosphere Reserve and Periyar ER and represents one of the best-protected examples of evergreen forests in the Western Ghats. The sanctuary is home to significant populations of locally endemic species, including *Gluta travancorica*, *Cynometra bourdillonii*, and *Palaquium bourdillonii*. Designated as an IBA, the PA has comprehensive checklists of its flora and fauna, with the presence of Myristica swamps, undulating terrain, thick forests, several waterfalls, and grasslands attracting many visitors. Local communities are actively engaged in revenue-generating eco-tourism activities, and the PA receives excellent support from the Thenmala Eco-Tourism Society. A management plan is in place, and each Gluta tree is marked and monitored, with staff well trained and good publicity materials available.

However, there are a few tribal settlements within the PA, where occasional cases of HWC have been reported. Additionally, funds are rarely available for the maintenance of assets, and there are issues with delays in the release of funds.

**Recommendations** - Recommendations include improving the management of invasive species, addressing solid waste pollution especially concerning plastics within the PA, and promptly resolving HWCs occurring in the tribal settlements.

### 15. Silent Valley NP, Kerala (2022-23):

The PA was notified in 1984 and is recognized as one of the globally significant outcomes of conservation movements. The well-protected core covers 90 Km<sup>2</sup> and is surrounded by a buffer zone extending to 148 Km<sup>2</sup>, which connects with Karimpuzha WLS and Mukurthi NP to the north. This PA is one of the least disturbed wet evergreen forests in the country and is part of the Nilambur ER. It boasts high levels of endemicity and is home to many rare and endangered species of plants and animals. Comprehensive taxonomic inventories have been conducted by institutions such as the ZSI, BSI, Kerala Forest Research Institute (KFRI), BNHS, and local educational institutes. There is a very popular school-centric nature education program in place, and a management plan is available, supported by active EDCs.

However, there are 11 tribal settlements on the eastern periphery, and several government agencies are involved in their socio-economic welfare, with the PA management playing only a marginal role. Major management challenges include the absence of detailed ecological studies on ecosystem attributes and on endemic, rare, and threatened species,

inadequate funding, and the progressive natural succession of woody species in grasslands.

**Recommendations** - Recommendations include upgrading research and monitoring activities with assistance from scientific and educational institutions, preventing the progression of woody species in the grasslands, providing sufficient and timely funds, expanding the size of inter-EDC sports by including more EDCs, training EDCs in the sustainable harvesting and marketing of NTFPs, and determining the carrying capacity of the tourism area to regulate visitor numbers effectively.

### 16. Kurinjimala WLS, Kerala (2023-24):

Located in the high ranges, southern Western Ghats and extending over 32 Km<sup>2</sup>, the PA was notified in October 2006 for the protection of Neelakurinji (*Strobilanthes kunthiana*), and endemic plant, which flowers once in 12 years. A part of the extensive High Range Landscape, the PA is connected with several forests and PAs of Tamil Nadu and Kerala. Harbouring a rich assemblage of flora and fauna of Tropical Montane biome, the PA has an approved management plan in place.

About 30% of the PA consists of private and revenue lands and final notification is pending due to non-settlement of rights of land holders. There is pressure to improve accessibility to the PA. The gregarious flowering of Neelakurinji attracts good number of visitors. The PA lacks baseline information on biodiversity.

**Recommendations** - Recommendations include acquisition of private lands, settlement of rights and demarcation of the boundary; capacity building of the field staff in handling new management tools and equipment, and mitigating human-elephant conflict; systematic inventorization and monitoring of biodiversity; improving incentives to staff.

### 17. Mangalavanam Bird WLS, Kerala (2023-24):

The PA is the only protected green area in the midst of densely populated Ernakulam City. Predominantly consisting of mangrove vegetation, this small PA extends over 2.74 ha and was notified in 2004. It is a place sought after by the local people for recreation and relaxation and also acts as an important place with a watch tower, an interpretation centre, signage and trails for spreading awareness about nature conservation. The place offers roosting and nesting habitat to the birds like cormorants. There is an advisory committee and an eco-development committee in place for managing the PA effectively.

The high-rise buildings, surrounding it, discharge untreated sewage into the PA. It also experiences heavy motor vehicle pollution. The interpretation centre, watch tower and signage are old and outdated. The railway line nearby adds to the heavy city noise, disturbing birds. There are reports of progressive decline in the bird numbers. Inter-sectoral coordination with Cochin Municipal Corporation, Railways, people's representatives and NGOs etc. Presently, the PA does not have an approved management plan.

**Management Recommendations** - Management recommendations include immediate updation and approval of the management plan; improvement and upgradation of the interpretation centre, watch tower, boardwalk, signages and interpretative material; improved inter-sectoral coordination to promote and protect this vital green lung of the city; using local knowledge and technology to regulate movement of the brackish water; diversion of sewage away from the PA; integrating the Railway's heritage building with the conservation of the PA; inclusion of mangrove experts and ornithologists in the management committee; improvement of the mangrove habitat and regular monitoring of bird population.

### 18. Neyyar WLS, Kerala (2023-24):

Notified in 1958, the PA Spreads over 128 Km<sup>2</sup> (including 9.1 Km<sup>2</sup> of Neyyar Reservoir), and derives its name from Neyyar River, originating from Agasthyamala peak. Contiguous with Kalakkad-Mundanthurai TR, and a few RFs and PAs of Kerala, the PA harbours several endemic species of the Southern Western Ghats, including second largest population of Nilgiri Tahr in Kerala. The outer boundaries of the sanctuary are well demarcated. Its proximity to Thiruvananthapuram city, well developed facilities for holding nature camps, and active women groups in the EDCs make it a popular place for visitors. It has an approved management plan, a Crocodile Breeding Centre, a Deer Park and a Lion Safari.

The ex-situ facilities for the lion, Cheetal and crocodile are out of place and inadequately managed, in addition of using up the scarce financial resources. The presence of 19 settlements within and people along the s-w boundary, cattle rearing, fishing, firewood and NTFP collection, roads towards settlements and cultivation of rubber in and outside settlements are sources of biotic interference. Annual fires, proliferation of weeds, difficult hill terrain and inadequate inter-sectoral coordination are also problematic.

**Recommendations** - Recommendations include conversion of present ex-situ facilities into rescue centre for injured or orphaned animals, butterfly park

etc.; systematic monitoring of endemic and RET species; capacity enhancement of staff and EDC members on protection, biodiversity monitoring, nature education and eco-tourism; study of the impact of tribal settlements on PA values; replacing *Eucalyptus*, *Acacia* plantations and weed infested areas into better wildlife habitats; improved engagement with research and academic institutions for systematic research, monitoring and nature education; improved veterinary facilities and funding.

### 19. Thattekad Bird WLS, Kerala (2023-24):

Thattekad Bird Sanctuary was notified in 1983. Flanked by the river Periyar in Ernakulam district, the 25.16 Km<sup>2</sup> PA is part of a large conservation landscape, consisting of vast stretches of RFs and PAs of Kerala. One of the richest bird habitats in south India, it is administered under the Idukki Wildlife Division. It consists of slightly disturbed evergreen, semi-evergreen and moist deciduous forests, reed brakes and grasslands with rocky outcrops, and small patches of Teak and Mahogany plantations. Around 234 species of bird are present, including the rare Sri Lankan Frogmouth. The biodiversity values are well documented due to long association of experts and research institutions and interpretation facilities are impressive.

The PA includes 9 Km<sup>2</sup> of human habitations leading to biotic interference and HWC. The EDCs are inadequately engaged in eco-tourism and nature education. Addition of 10.17 Km<sup>2</sup> area into the PA is pending for a long time. A number of home-stays and tourism facilities have come up in the vicinity of the PA, putting tourism pressure.

**Recommendations** - Recommendations include urgent rationalization of PA boundaries by excluding human settlement area and inclusion of 10.17 Km<sup>2</sup> forest area; posting a Wildlife Assistant for institutional research, monitoring and nature education; strengthening EDCs for managing eco-tourism; innovative human-wildlife mitigation measures; systematic monitoring of previously laid vegetation plots; creation of a forest station to strengthen PA protection.

### 20. Kottiyoor WLS, Kerala (2024-25):

Located on the north-west slopes of the Western Ghats, the 30.38 Km<sup>2</sup> PA is part of a larger landscape, consisting of the forests of Kodagu district in Karnataka, and extensive RFs and Aralam WLS of Kerala. Notified in 2011, the PA has excellent semi-evergreen forests and Shola-grassland complex with several endemic and RET species of flora and fauna,

including four primates. Administered under Aralam Wildlife Division, it has an approved management plan, and is relatively free of biotic disturbances.

Very large number of pilgrims visit the PA during the annual Kottiyoor Temple fair for about 15 days. The PA has hilly, difficult terrain with inadequate staff numbers and management infrastructure. It lacks basic inventory of the PA values, interpretation and visitors' facilities and has inadequate association with scientific institutions and NGOs. A boundary wall is coming up at the Aralam Farm, which would increase movement of elephants in the PA.

**Recommendations** - Recommendations include management of Kottiyoor and Aralam WLSs as one single unit with appropriate deployment of staff, physical infrastructure and financial resources; formulation of an elephant conflict mitigation strategy, which is likely to increase after the wall of the Aralam Farm is completed; establishment of a Forest Station; establishment of a weather station and assessment of hydrology and geomorphology; inventorization and systematic monitoring of floral and faunal diversity; and improved engagement with scientific institutions and NGOs.

### 21. Peechi-Vazhani WLS, Kerala (2024-25):

The 125 Km<sup>2</sup> PA is part of a large landscape of about 4500 Km<sup>2</sup>, covering two TRs, two NPs and three WLSs, and several RFs spread over Tamil Nadu and Kerala. The sanctuary is also a part of the Anamudi ER. It was notified in 1958 to protect the catchment forests of Peechi and Vazhani reservoirs, which provide drinking and irrigation water to Thrissur district. Located close to important research institutions, its biodiversity is well documented and contains about 1000 flowering plants, 58 mammal species and 243 birds. An excellent place for nature education and tourism, the PA has high footfall of students, researchers and tourists. Management has good relations with scientific institutions and NGOs.

There are nine tribal colonies and a large rubber estate within the PA boundary, in addition to six non-tribal proximate settlements. Inadequate eco-development programmes, visitors' facilities, protection infrastructure, shortage of protection watchers, inadequate monitoring of various activities and financial constraints are major weaknesses of the management.

**Recommendations** - Recommendations include implementation of the FRA and voluntary relocation of the tribals; engagement with the Vaniyampara Rubber Estate for promoting conservation-friendly activities; systematic implementation of livelihood supporting

eco-development programmes; establishment of an interpretation centre at Peechi and improvement of visitors' facilities; systematic need-based research and monitoring; better inter-departmental coordination;

monitoring of the long-term effects of the Kuthiran tunnel on NH 47; boating facilities for staff and increased APCs for effective protection.

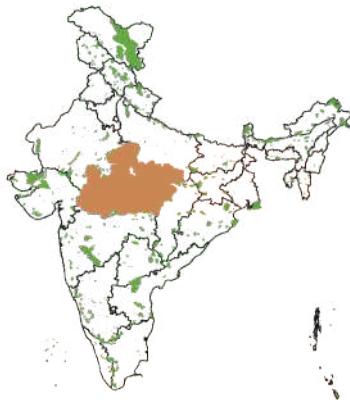
*Trend of MEE scores between first and repeat cycles*

Sl. No	PAs	First Cycle			Repeat Cycle			Trend
		Phase	MEE Score (%)	Category	Evaluation Year	MEE Score (%)	Category	
1	Wayanad WLS	2006-2009	59.1	Fair	2018-2019	66.6	Good	▲
2	Anamudi Shola NP	2017-2018	66.67	Good	2022-2023	85.16	Very Good	▲
3	Aralam WLS	2017-2018	78.33	Very Good	2022-2023	82.03	Very Good	▲
4	Chimmony WLS	2017-2018	56.67	Fair	2022-2023	81.25	Very Good	▲
5	Chinnar WLS	2017-2018	84.17	Very Good	2022-2023	89.84	Very Good	▲
6	Chulannur Peafowl WLS	2017-2018	50.83	Fair	2022-2023	59.38	Fair	▲
7	Eravikulam NP	2006-2009	77.3	Very Good	2022-2023	92.97	Very Good	▲
8	Idukki WLS	2015-2017	80.83	Very Good	2022-2023	81.25	Very Good	▲
9	Karimpuzha WLS	-	-	-	2022-2023	61.72	Good	-
10	Malabar WLS	2018-2019	66	Good	2022-2023	71.09	Good	▲
11	Mathikettan Shola NP	2015-2017	81.67	Very Good	2022-2023	90.63	Very Good	▲
12	Pambadum Shola NP	2017-2018	70.83	Good	2022-2023	82.81	Very Good	▲
13	Peppara WLS	2012-2013	58.33	Fair	2022-2023	73.44	Good	▲
14	Shendurney WLS	2009-2010	75.78	Very Good	2022-2023	77.34	Very Good	▲
15	Silent Valley NP	2012-2013	75.83	Very Good	2022-2023	79.69	Very Good	▲
16	Kurinjimala WLS	2018-2019	61.67	Good	2023-2024	72.41	Good	▲
17	Mangalavanam Bird WLS	2018-2019	56.25	Fair	2023-2024	54.31	Fair	▼
18	Neyyar WLS	2018-2019	72.5	Good	2023-2024	75.78	Very Good	▲
19	Thattekad Bird WLS	2018-2019	77.5	Very Good	2023-2024	84.38	Very Good	▲
20	Kottiyoor WLS	2018-2019	67.5	Good	2024-2025	69.83	Good	▲
21	Peechi-Vazhani WLS	2018-2019	69.17	Good	2024-2025	68.75	Good	▲

# Madhya Pradesh



Sambar © Vivek Sarkar



## Madhya Pradesh

Madhya Pradesh is in the western region of India, covering an area of 308,252 Km<sup>2</sup>. The state's forest cover is 77,073.44 Km<sup>2</sup>, which is 25% of its total area (ISFR 2023). In the first cycle of MEE, a total of 24 PAs are assessed, and in the repeat cycle, 22 PAs are assessed. In the repeat cycle, 2 PAs are excluded, as one falls under a TR and one PA is denotified.

### 1. Kuno WLS, Madhya Pradesh (2018-19):

Kuno Palpur WLS was notified in 1981 and covers an area of approximately 344.25 Km<sup>2</sup>. The sanctuary is being prepared to potentially establish the second lion population in the country and is recognized as a region of rich biodiversity. Tigers from Ranthambore occasionally migrate to Kuno WLS and further to Madhav NP, Panna TR, and Datia. There are no human habitations within the PA, as the erstwhile enclaved 24 villages have been successfully relocated outside its boundaries. The PA is well protected and managed, with staff who are adequately trained and equipped, and good protection infrastructure in place. Additionally, large sections of the sanctuary have been developed as grassland, with sufficient funding and resources available.

However, the relocation of lions has not yet occurred due to administrative and legal issues. The tourism potential of the PA has also not been fully exploited, and publicity and educational materials are insufficient.

**Recommendations** - Recommendations include reconsidering the idea of introducing lions and instead maintaining the PA as a tiger dispersal habitat given its

habitat and terrain characteristics; managing habitats to support the natural succession of vegetation; developing a PA-specific management plan; systematically monitoring grassland development and management; enhancing coordination with academic and research institutions for targeted ecological research; inventorying gun licenses in the buffer area; studying connectivity with Chambal WLS to protect aquatic wildlife; and improving publicity and outreach efforts for the PA.

### 2. Madhav NP, Madhya Pradesh (2018-19):

Madhav NP was notified in 1959 and spans an area of approximately 360.87 Km<sup>2</sup>. Located near the town of Shivpuri, the PA is surrounded by a vast tract of RF and is connected to Kuno Palpur WLS and Panna TR to the east. The sanctuary is rich in biodiversity and offers significant potential for wild animal sightings, birdwatching, and historical tourism. It is well protected, with night patrolling in place, and is sufficiently funded and adequately staffed, remaining largely free from human habitations. The park boasts a successful village relocation program and runs a children's nature education program called Anubhooti.

Despite being an important component of a larger landscape, the current management plan does not incorporate landscape planning concepts. Additionally, the management plan has expired, and there is inadequate involvement from NGOs and research institutions in ecological research and monitoring.

**Recommendations** - Recommendations include reintroducing tigers or establishing a tiger safari within the PA, improving publicity and outreach efforts, involving academic institutions in monitoring and documenting grassland management, weed removal, and controlled burning, notifying an ESZ, and raising plantations along the western boundary of the PA. It is also essential to complete the relocation of remaining villagers, add some forest blocks from the Shivpuri Division, control the inflow of sewage to Sakya lake, enhance engagement with the people of Shivpuri town, and purchase vehicles to improve protection and tourism efforts.

### 3. Bagdara WLS, Madhya Pradesh (2020-22):

The PA was first notified in 1978, covering 478 Km<sup>2</sup> of protected forests and revenue lands without any designated RFs. However, the final notification is pending due to the need for settlement of rights for affected local communities. The PA is known for its stone-age rock paintings and the geologically significant Kaimar hills, consisting predominantly of dry tropical mixed deciduous forests. It is home to a diverse range of flora and fauna typical of dry central Indian forests and forms the catchment area for the Son and Belan rivers.

The weaknesses of the PA include the absence of designated RFs, the non-settlement of rights for affected local communities, and the presence of 64 villages within the PA, along with many more surrounding it, which exert high biotic pressure, including marginal encroachments. Additional challenges include inadequate participatory programs, and a lack of publicity and information regarding the PA.

**Recommendations** - Recommendations include expediting the process of settling the rights of local people and finally notifying the PA; energizing existing joint forest management committees and ensuring the planning and implementation of eco-development programs; persuading enclaved villagers to relocate following the successful relocation programs implemented in Ratapani and Noradehi Wildlife Sanctuaries; improving staff numbers, capacities, and

overall protection infrastructure; and enhancing the PA's habitats, publicity efforts, and scientific information base.

### 4. Dinosaur Fossil NP, Madhya Pradesh (2020-22):

Dinosaur Fossil NP was notified in 2011 and covers an area of 8.9 hectares. It is perhaps the only NP in India established to protect geomorphological and paleontological values, as it is home to 65 million-year-old dinosaur fossils and prehistoric gymnosperms discovered by a school teacher in Dhar Forest Division. The site is easily accessible, and the curiosity to see the dinosaur fossils attracts many tourists, supported by local communities. The PA is administered under the Bagh Range of Dhar Forest Division, and a draft management plan has been submitted for approval.

However, the park faces significant challenges, including an extreme shortage of funds, a lack of knowledge regarding paleontology among forest staff and local communities, and accidental removal of fossils, which all contribute to management weaknesses.

**Recommendations** - Recommendations include approving the draft management plan, enhancing the capacities of staff and local stakeholders in fossil management, preparing a participatory eco-tourism plan, and creating a visitor cum interpretation center. There should also be the introduction of nature education programs for schools and local communities, improving inter-departmental coordination to protect fossil sites outside the PA, and providing better protection infrastructure.

### 5. Ghatigaon WLS, Madhya Pradesh (2020-22):

The PA spans 512 Km<sup>2</sup> and was notified in 1981 to protect GIB. However, bustards are now locally extinct due to multiple biotic factors. The sanctuary serves as an important catchment for tributaries that feed into the Ganga Basin and provides an ideal habitat for the fauna of the dry grassland-savannah system. Multiple species of vultures are often seen in and around the PA.

The final notification of the PA is pending due to the need for settling the rights of local communities. There are 55 villages within and around the PA whose residents are largely dependent on its resources for subsistence. Illegal mining of stones from the PA has led to ongoing conflict between PA staff and locals, and the habitat has become highly degraded. Additionally,



there is a lack of visitor facilities and nature education resources, and the staff are inadequately trained for managing such a specialized site.

**Recommendations** - Recommendations include settling the rights of the people to facilitate the issuance of the final notification, examining the necessity of including private lands within the boundaries of the PA with the help of experts to rationalize and minimize PA-people conflicts, developing eco-development programs in collaboration with the National Livelihood Mission to provide livelihood opportunities for locals, improving coordination with the district administration and police, establishing a joint check-post with police at Lakhaura Chowki to prevent illegal mining, preparing a GIB Recovery Plan following IUCN guidelines, and enhancing nature education and outreach functions of the PA.

## 6. Ken Gharial WLS, Madhya Pradesh (2020-22):

The PA is situated close to the Khajuraho temple and was notified in 1981, although the final notification is still pending. Covering an area of 45.2 Km<sup>2</sup>, including 9.3 Km<sup>2</sup> of revenue land, the PA consists of a critical stretch of the Ken river, created exclusively to protect Gharials. It also serves as the catchment area for the Ken river. An ESZ was notified in 2017, extending 200 meters wide. The PA features floral and faunal elements typical of the Central Indian Highlands, characterized by Teak-dominated mixed forests, and has the potential to support good populations of both Gharials and Mugger crocodiles.

Despite these strengths, only 26 Gharials remain in the PA today, despite the release of 139 Gharials since its establishment. The presence of three villages within the PA exerts substantial biotic pressure, including illegal sand mining. Challenges such as the lack of suitable habitat, particularly sand banks, threats of flooding, an acute shortage of staff, inadequate protection infrastructure, and conflicts with local



communities hinder effective management.

**Recommendations** - Recommendations include relocating the enclaved villages, obtaining the final notification for the PA, improving staff numbers and protection infrastructure including the deployment of drones; conducting scientific monitoring; requesting the WII to study habitat improvement, especially to identify suitable sand banks; opening a dedicated website for the PA; and establishing a dialogue with local communities to ensure the long-term conservation of Gharials.

## 7. Nauradehi WLS, Madhya Pradesh (2020-22):

The largest PA in Madhya Pradesh, it extends over 1,186.96 Km<sup>2</sup> and was notified in 1975, although the final notification is still pending. An ESZ was notified in 2017. The sanctuary lies in the basins of the Ganga and Narmada rivers, which is a unique feature, and

represents central highland vegetation with rich floral and faunal assemblages. The savannah-grassland areas in the south have been proposed for the release of cheetahs. The diversity of habitats within the PA includes multiple water bodies, and it is connected to other PAs in the state through tenuous corridors. The wolf serves as the flagship species, and recently, two tigers were radio-collared and released in the PA, with the tigress giving birth to three cubs, resulting in a current tiger population of five individuals.

However, the sanctuary is home to 75 villages located within and around it, causing heavy grazing pressure, which is the most severe attrition factor. A village relocation program is currently underway. Management issues include the absence of an approved management plan, inadequate staff and protection infrastructure, insufficient funding, lack of bridges across major rivers, and a lack of monitoring for key faunal species.

**Recommendations** - Recommendations include issuing the final notification by settling the rights of local people, immediately preparing the management plan, constructing bridges over the Bamner and Bayarama rivers, improving staff numbers, capacities, and protection infrastructure, continuing with the village relocation program while simultaneously enforcing strict control over cattle grazing in the PA, initiating eco-tourism programs, and undertaking regular censuses of key faunal elements.

## 8. Ratapani WLS, Madhya Pradesh

### (2020-22):

The PA extends to 907.71 Km<sup>2</sup> in the Vindhyan Ranges, which includes 824 Km<sup>2</sup> of RFs. It is administered under the Obedullaganj Forest Division and features a compact area characterized by southern dry tropical forests and grasslands, predominantly dominated by Teak. The PA forms part of a larger forested landscape, connecting with neighboring territorial forests, and contains two large reservoirs. In addition to its rich floral and faunal diversity, the PA is renowned for the Bhimbhetka Stone Age caves, a UNESCO World Heritage Site and a major tourist attraction. The management conducts regular population estimations of key faunal species and implements good habitat management practices.

However, the sanctuary faces high biotic disturbances from 32 villages within its boundaries. A village relocation program is currently underway, though the area is crossed by a railway track, two national highways, and two state highways. Additionally, the PA



Gharial © Dr. Vineet Singh

does not have an approved management plan and has a low prey base.

**Recommendations** - Recommendations include completing the management plan, preparing a strategy to enhance the habitat values of Teak plantations by selectively removing Teak and increasing the presence of miscellaneous tree species, continuing with the relocation of remaining enclave villages, implementing mitigation measures to reduce negative impacts from linear infrastructure, rebuilding the prey base through rewilding exercises, developing eco-development programs to improve relationships with local communities, enhancing staff training, and taking action to upgrade the PA into a TR.

### 9. Fossil NP, Madhya Pradesh (2022-23):

The unique NP extends to 27.24 hectares and was notified in 1983 to protect petrified plant fossils found in the Southern Dry Deciduous Forest of Dindori District in Madhya Pradesh. It is part of the Satpuda-Maikal Range and consists of two forest areas, Ghughua and Umaria, with the latter being very small and widely separated by human-dominated landscapes and forests. The park is known for housing a *Eucalyptus* fossil, which is the oldest fossil of its kind ever discovered, making it a major attraction. The PA is fenced all around and features a well-maintained interpretation center with properly displayed fossil specimens.

However, the PA faces several challenges, including the absence of an approved management plan, insufficient management attention toward the Umaria portion of

the PA, weak fencing, inadequate staff strength, amenities, and training, alongside lacking signage and lighting in the existing interpretation center. Additionally, there is no involvement of NGOs or local institutions to support management efforts. The current management lacks sanctioned staff and has not explored the multiple ecological and educational values of the PA.

**Recommendations** - Recommendations include preparing a scientific management plan, maintaining the perimeter fence properly, creating appropriate staff positions and posting permanent staff within the PA, updating the information center with the latest information and modern technology, involving the Archaeological Survey of India (ASI) in the training of staff and local guides, improving PA publicity and outreach efforts, bringing the Umaria portion of the PA under proper management, and reviving collaboration with the Birbal Sahani Institute of Paleobotany in Lucknow and the Geological Survey of India (GSI) for better maintenance and educational initiatives.

### 10. Gandhi Sagar WLS, Madhya Pradesh (2022-23):

The PA is located on the western border of the Malwa plateau, along the banks of the Chambal river, and covers an area of 368.62 Km<sup>2</sup>. It is part of a larger landscape of savannah mixed dry deciduous forests and is connected to the adjoining Bhainsrodgarh WLS, Mukundara TR (Rajasthan), and the territorial forests of Madhya Pradesh. The PA was initially notified in 1974, with a subsequent notification in 1983 that expanded

its boundaries to the present size. An ESZ has also been notified. The Chambal river flows through the sanctuary, dividing it into two parts. A total of 506 angiosperms, 246 bird species, and 17 mammal species have been documented within the PA. Notably, the sanctuary supports breeding populations of four vulture species, including the critically endangered Long-billed Vulture. The presence of historical forts, prehistoric rock paintings, and temples adds high cultural and religious value to the area, which also benefits from 12 EDCs in fringe villages.

However, the PA faces significant challenges due to one village located within and 12 villages in the immediate vicinity, which exert very high grazing pressure. Many villagers possess guns, and there is a massive influx of pilgrims to the temples during festival seasons. The sanctuary lacks a systematic management plan, suffers from staff shortages, inadequate training, poor protection infrastructure, and the absence of participatory eco-tourism, nature education, and interpretation programs. Unregulated pilgrim movement, inactive EDCs, weak NGO involvement, and a lack of scientific research and monitoring further undermine management effectiveness.

**Recommendations** - Recommendations include filling staff vacancies and enhancing their skills, knowledge, mobility, and amenities; improving protection infrastructure; preparing a management plan following WII's guidelines; activating the EDCs and streamlining eco-development programs that include eco-tourism, pilgrimage management, and livestock grazing control; enhancing inter-divisional and inter-state departmental coordination; improving cross-sectoral collaboration; increasing publicity for the PA, and developing nature education and interpretation programs; involving local NGOs and institutions in systematic socio-ecological research and monitoring; engaging with the ASI to maintain cultural sites; and preparing and implementing a vulture conservation plan.

## 11. Kheoni WLS, Madhya Pradesh (2022-23):

The PA spans 134.78 Km<sup>2</sup> and is located in the Vindhya and Malwa plateaus. It was initially notified in 1955, with the final notification issued in 2005. The sanctuary represents Central Indian subtropical dry deciduous forests and grasslands, and is part of a larger landscape that connects Ratapani and Melghat TRs. Five tigers have been photographed within the PA, which serves as the catchment area for the Balganga and Jamner

rivers. Historically, the PA was a hunting ground for the Holkar dynasty, which adds to its high cultural and religious values, along with its excellent aesthetic appeal. A 3.5 km long, 3-meter-high chain-link fence has been erected along the southern boundary, and the interpretation center has been improved.

However, there are 40 villages surrounding the PA that exert significant biotic pressure, leading to issues such as illegal tree felling, livestock grazing, and encroachment. Other management challenges include inadequate protection infrastructure, a shortage of staff, the absence of regular training programs, inadequate funding, poor stakeholder participation, insufficient research and monitoring, weak eco-development programs, and a lack of publicity, nature education, interpretation, and eco-tourism initiatives.

**Recommendations** - Recommendations include taking action to create an independent wildlife division, improving staff strength and protection infrastructure, ensuring enhanced financing for the PA, strengthening eco-development programs for both PA protection and livelihood improvement, engaging local institutions in documenting biodiversity and conducting systematic research and monitoring, developing infrastructure and programs for nature interpretation, education, and eco-tourism, improving publicity efforts, and training local youth as wildlife guides and in visitor management.

## 12. Narsighgarh WLS, Madhya Pradesh (2022-23):

Narsighgarh WLS was notified in 2002 and extends to 57.19 Km<sup>2</sup>. Located on the eastern border of the Malwa plateau along National Highway 12, the sanctuary predominantly features dry deciduous forests and savannah formations. It has documented 181 species of plants, 23 mammals, 114 birds, and 6 fish species. The sanctuary serves as the catchment area for the Kalisind and Parvati rivers, with the presence of lakes, aquifers, and marshy areas adding high hydrological value. While approximately 37% of the boundary is properly demarcated, the sanctuary has 12 EDCs and a management plan in place.

However, there are 71 villages on the periphery and two villages within the PA, exerting high biotic pressure. About 1.83% of the sanctuary area is under encroachment, and boundary disputes exist in some locations. The EDCs are not very active, and the management plan has not been drafted according to the guidelines provided by WII. The PA suffers from ecological isolation, and the staff lacks proper training

in wildlife management. There are also inadequate interpretation programs and habitat restoration activities.

**Recommendations** - Recommendations include settling boundary disputes and consolidating the sanctuary's boundaries, revising the existing management plan in accordance with WII's guidelines, improving staff training, strengthening the EDCs and developing eco-development programs for PA protection and livelihood improvement, relocating the two enclaved villages from the PA, involving local institutions for periodic animal estimations and monitoring, and enhancing PA publicity, visitor management, and interpretation programs.

### 13. National Chambal WLS, Madhya Pradesh (2022-23):

National Chambal WLS was initially notified in 1978 and is approximately 485 Km long, including the stretch of the Chambal river and 60 km of the Parvati river, resulting in a PA that falls within the jurisdictions of Uttar Pradesh, Madhya Pradesh, and Rajasthan. The PA is specifically designated to protect the Gharial (*Gavialis gangeticus*) and consists of a total area of about 600 km of the river's length declared as a WLS. The PA boundary extends to 1 km from the middle of the river channel. It represents a semi-arid biome, with riparian vegetation consisting of sparse ground cover along the severely eroded riverbanks and adjacent ravine lands. The sanctuary is home to six critically endangered, 12 endangered, and 18 vulnerable species, including the Gangetic dolphin. With approximately 308 species of birds, the sanctuary is recognized as an IBA. A scientific management plan is in place, and a 2-km-wide ESZ surrounding the PA has been notified. The sanctuary experiences good visitor footfall, particularly to the Deori Gharial Rearing Centre near Morena, and offers effective nature education and awareness programs.

Despite these strengths, the PA faces challenges due to the presence of 173 villages and 44 ghats, which contribute to biotic disturbances in the form of sand and stone mining and cattle grazing, adversely affecting nesting sites. There are currently vacancies for an ACF and three ROs. Additionally, there is a proposal to denotify multiple patches of the PA, totaling 207 hectares. Other management challenges include inadequate staff strength and training, insufficient protection infrastructure, inactive EDCs, a lack of monitoring for captive-bred and released Gharials, presence of dams affecting water flow, and

dependence of local people on irrigation water, which reduces water availability in the sanctuary, alongside poor interpretation infrastructure.

**Recommendations** - Recommendations include filling existing vacancies and increasing the number of field staff, organizing systematic training for staff—particularly in participatory management and eco-tourism, dividing the current three ranges into more manageable sizes, activating EDCs and engaging them in livelihood improvement activities such as eco-tourism and PA protection, improving cross-sectoral coordination to ensure required water flow within the PA, developing a well-designed interpretation center at Deori, enhancing engagement with multiple stakeholders, and improving cattle disease surveillance and wildlife health monitoring.

### 14. Orcha WLS, Madhya Pradesh (2022-23):

The PA, which spans 44.9 Km<sup>2</sup>, was notified in 1999 and was formerly a hunting reserve of the Bundelkhand rulers. It represents tropical dry deciduous vegetation, featuring pure patches of Teak in flat valleys and excellent riparian forests dominated by Jamun and Arjun trees. The sanctuary is primarily protected by two perennial rivers, the Betwa on the west and the Jamni on the east, while the forest areas from the Jhansi and Orcha territorial divisions further enhance its protection. The PA includes 12 islands and is known for being a suitable habitat for crocodiles, as well as for its rich assemblage of various plants and animals from the region. It features a well-maintained nature trail for bicycle riders, with dustbins placed at various points, and an ESZ has been notified. Additionally, it is located near Khajuraho, adding to its significance.

However, there are 22 peripheral villages and one enclaved village within the PA that depend on its resources for subsistence. State Highway 76 cuts through the sanctuary, dividing it into two isolated sections. The current management plan does not adhere to the guidelines set by WII. Challenges include a porous border with Uttar Pradesh, inadequate numbers, capacity, and mobility of staff, insufficient visitor amenities, the presence of a fence alongside the highway that prevents animal movement, the absence of an interpretation center, and a shortage of funds.

**Recommendations** - Recommendations include preparing a management plan that aligns with WII guidelines, dismantling the fence along the highway to facilitate wildlife movement, expediting the relocation of Singhpura village from the PA, improving staff

numbers, training, and mobility, appointing an ACF for administrative supervision, developing an interpretation center, creating a website and publicity materials, involving local institutions to build baseline information, training local youth as tourist guides to enhance visitor experiences, and linking the PA with the Khajuraho tourist circuit.

### **15. Van Vihar NP, Madhya Pradesh (2022-23):**

The PA covers 445.21 hectares and is located on the banks of Bhopal lake. It was notified as a NP in 1983 and was designated as a small zoo by the CZA in 2010. This unique NP combines a zoological park, a rescue center, a conservation breeding center, and a conservation education center. The conservation breeding program focuses on the Hard Ground Barasingha and vultures. The PA features a well-equipped veterinary facility and a dedicated rescue team with a rescue van. The interpretation center attracts thousands of visitors, and the sanctuary provides excellent amenities for cycling, walking, and relaxing amidst the bustling city, giving it high value for nature education and awareness. The PA actively maintains a presence on social media.

However, there is a significant crowd on weekends and holidays, and the absence of a nature education specialist within the PA requires management attention.

**Recommendations** - Recommendations include introducing refresher courses on wildlife management for staff, training local students as tourist guides, especially during holidays, appointing a Nature Education Officer to ensure effective dissemination of conservation messages, utilizing the existing amphitheater more effectively for educational and interpretive purposes, involving the Indian Institute of Forest Management (IIFM) and other educational institutions through formal memoranda of understanding (MoUs) for various studies and monitoring programs, and monitoring vegetation through the establishment of permanent plots.

### **16. Phen WLS, Madhya Pradesh (2023-24):**

Recognized as a satellite core of the Kanha TR, the 110.74 Km<sup>2</sup> PA was notified in 1983, and currently it is integrated with Kanha administration. It acts as a corridor between Kanha and Achanakmar TRs, and harbours similar floral and faunal elements as that of Kanha TR, except Hard Ground Barasingha. During 2011-12, several cattle camps and a forest village were relocated out of the PA. Predominantly a Sal forest, the

PA acts as catchment of river Phen, which joins river Narmada at Mandla. The PA has an approved management plan, well-defined boundaries, good protection infrastructure and systematic management regime.

The PA forms inter-state boundary with Chhattisgarh to the east and is exposed to left-wing extremism. It also experiences biotic pressure of grazing and forest resource extraction on the fringes. Several traditional trails cut through the forests, used by local villagers for NTFP collection. Summer fires also pose management challenges.

**Recommendations** - Recommendations include aligning the management plan to WII guidelines; establishment of an interpretation centre, signages and visitors' facilities and services; and implementation of need-based research and monitoring.

### **17. Ralamandal WLS, Madhya Pradesh (2023-24):**

Situated close to the city of Indore, this small 2.35 Km<sup>2</sup> PA was notified in 1988 and acts an important nature education centre with an interpretation centre, a safari park, a children's corner, a nature trail, a cycle track, and visitors' facilities. About 70,000 visitors annually visit the PA. The small hillock has tropical dry deciduous forests and a few tree plantations with associated animals including leopard, Hyena, Jackal, Chital, Blackbuck, Chinkara, Wild Boar, Hare and Peafowl. The entire sanctuary is fenced off with chain-link fencing. Approved management plan is in place.

There are five villages on the fringes, with a population of over 8000 and a cattle population of about 4500. Major management challenges include expansion of Indore around the PA involving mining for stone, sand and soil, upcoming factories, tourism at Shikargarh Fort, incomplete interpretation centre, absence of signage along various trails, and absence of participatory programmes with proximate villagers and NGOs.

**Recommendations** - Management recommendations include upgrade and complete the interpretation centre; develop educational signage along trails; increase the numbers of nature camps for schools and locals; plant native trees in *Gliricidia* plantation area; and camouflage and blend the waterholes with natural surroundings.

### **18. Sailana WLS, Madhya Pradesh (2023-24):**

Spreading over 12.96 Km<sup>2</sup> area, the PA with its semi-

arid grassland and savannah vegetation was notified in 1983 for the conservation of Lesser Florican. There is proposal to swap 4.46 Km<sup>2</sup> of revenue and private lands with 4.60 Km<sup>2</sup> of forest land. It is administered under Ratlam Forest Division and has an approved management plan. A 3.96 Km<sup>2</sup> ESZ surrounds the PA. Farmers are paid financial incentives to inform the presence of the Florican. Several anicuts have been constructed to hold the flowing water in the PA.

Lesser Florican has not been seen over the last five years. Probable reasons could be unscientific grassland management, incomplete fencing around, egg trampling due to increase in Nilgai and cattle population, presence of wind mills nearby, land-use changes in the proximity, inadequate staff training, housing and protection infrastructure, discontentment among a section of villagers due to restrictions on revenue lands in the PA lands, and absence of participatory and educational programmes.

**Recommendations** - Recommendations include revision of the management plan in consonance with WII guidelines; completing grassland fencing; reduce the Nilgai population through scientific planning; improve management of grasslands for creating better habitat for the Florican; engage with local people and administration to notify the revenue lands in the PA as Conservation Reserve; develop participatory programmes, including eco-tourism; improve staff training, housing and protection infrastructure; and increase nature education.

## 19. Sardarpur WLS, Madhya Pradesh (2023-24):

The PA extends over 203.44 Km<sup>2</sup> with less than 3% forest land and the rest (197.59 Km<sup>2</sup>) being the revenue and private lands belonging to 14 villages. A typical savanna-type grassland with scattered trees (mostly *Acacia nilotica*), the PA was notified in 1983 for the conservation of Lesser Florican and associated grassland-savannah fauna. The forest patch is compact, fenced and well-protected. Earthen anicuts have been constructed across small nallas. Anti-acoustic walls have been erected along the Ahmedabad highway. Farmers are paid financial incentives to inform the presence of the Florican.

Lesser Florican has not been seen over the last four years. Probable reasons could be unscientific grassland management, incomplete fencing around, egg trampling due to increase in Nilgai and cattle population, presence of wind mills nearby, land-use changes in the proximity, inadequate staff training,

housing and protection infrastructure, discontentment among a section of villagers due to restrictions on revenue lands in the PA lands, and absence of participatory and educational programmes.

**Recommendations** - Recommendations include revision of the management plan in consonance with WII guidelines; completing grassland fencing; reduce the Nilgai population through scientific planning; improve management of grasslands for creating better habitat for the Florican; engage with local people and administration to notify the revenue lands in the PA as Conservation Reserve; acquire Patta lands within the forest patch; develop participatory programmes, including eco-tourism; improve staff training, housing and protection infrastructure; and increase nature education.

## 20. Singhori WLS, Madhya Pradesh (2023-24):

Situated on the Bhopal-Jabalpur highway and extending over an area of 287.19 Km<sup>2</sup>, the PA was notified in 1976. Administered under Obaidullaganj Forest Division, the PA is connected to the Ratapani TR through intervening forest corridors. The Barna reservoir covers about 30% of the PA and Teak mixed deciduous forests the rest, which is predominantly hilly. Tiger and leopard with their prey species and a variety of migratory birds enrich the faunal diversity. Famous for some pre-historic caves and temples, the PA has good eco-tourism and nature education potential.

There are 21 villages within the sanctuary and 142 villages along the periphery, exerting high biotic pressure. Although there are 37 EDCs, only a few are active. Inadequate protection infrastructure, shortage of staff, financial constraints, absence of research, monitoring, interpretation, education and eco-tourism, and non-involvement of NGOs and research organization are other management challenges.

**Recommendations** - Recommendations include revision of management plan in consonance with WII guidelines; development of eco-development programmes with the local villagers, including eco-tourism on the islands; procurement of boats for protection and tourism; increase in staff numbers and improvement of staff housing, amenities and training and protection infrastructure; improvement of visitors' facilities; engagement with institutions and NGOs for ecological research and monitoring; and systematic habitat management.

## 21. Son Gharial WLS, Madhya Pradesh (2023-24):

Bordering eastern UP, Bihar and Chhattisgarh, the river sanctuary was notified in 1981 for protecting the Gharial, Crocodile, various Soft-shell Turtles and birds such as the Indian Skimmer and other migratory waterfowl. Total notified area of the PA is 418.22 Km<sup>2</sup> over 160.93 Km length of Son river along with its two tributaries, the Gopad and Banas. The Bansagar dam is within the PA. Administered under the Sanjay-Dubri TR, the PA has an approved management plan and a hatchery is present for conservation breeding. Bansagar dam is within the PA. A few breeding sites are protected by nets and a few watch towers have been constructed for watch and ward by the staff.

The water flow in the PA is not consistent over different seasons, as the release of water is regulated in the Bansagar dam and Gopad barrage. The resource use rights of the people of 122 villages residing along the river banks have not yet been settled, and patrolling the long stretch requires much man power. Sand mining and stray dogs pose serious challenge for protecting the nesting sites and eggs of the reptiles and birds. The PA suffers from shortage of staff and inadequate protection infrastructure.

**Recommendations** - Recommendations include improving inter-departmental coordination for maintaining ecological flow in the rivers and tributaries all through the different seasons; engaging with civil society at large for eliciting conservation support; controlling illegal sand mining; improving numbers, capabilities, equipments and amenities of the staff; improving overall protection infrastructure; establishment of additional hatcheries; protecting breeding sites from stray dogs and other predators; implementing participatory eco-tourism and systematic hydrological studies; and translocation of a male Gharial from Chambal WLS for rebuilding the population in the PA.

## 22. Veerangana Durgavati WLS, Madhya Pradesh (2023-24):

Veerangana Durgavati WLS was notified in 2021 and covers an area of 23.9 Km<sup>2</sup>. This highly revered historical site is one of the core areas of the Neoradehi TR and connects to Panna TR through dense forests in the Damoh Forest Division, under whose administration the PA is managed. The sanctuary features good forest cover and perennial water sources, supporting rich floral and faunal diversity.

Attractions such as the Singoragarh Fort, various scenic spots, water bodies, and waterfalls draw tourists to the area, although the level of tourism remains low. The management plan for the sanctuary is currently awaiting approval.

The PA is surrounded by 13 proximate villages that exert some biotic pressure on its fringes. The sanctuary lacks dedicated staff for management, relying instead on personnel from territorial ranges for protection and management activities. Despite its historical significance and natural resources, there is minimal publicity regarding the sanctuary. It also faces challenges due to a shortage of trained staff, lack of educational and interpretation programs, insufficient eco-tourism initiatives, a lack of ecological research and monitoring, and limited involvement from NGOs and scientific institutions.

**Recommendations** - Recommendations include the development and implementation of a participatory eco-tourism program, planning and executing livelihood-linked eco-development activities, remodeling the nature interpretation center and enhancing education, awareness, and publicity programs. It is also essential to regulate local picnic-based tourism to the fringes of the PA, increase entry fees for the sanctuary, implement systematic meadow development, engage with NGOs and research institutions for systematic biodiversity inventories, ecological monitoring, eco-development initiatives, and staff training, and urgently approve the management plan.

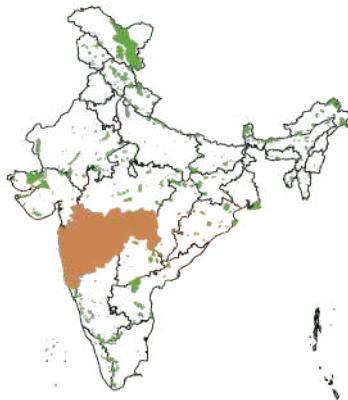
## Trend of MEE scores between first and repeat cycles

SI. No	PAs	First Cycle			Repeat Cycle			Trend
		Phase	MEE Score (%)	Category	Evaluation Year	MEE Score (%)	Category	
1	Kuno WLS	2006-2009	58.3	Fair	2018-2019	79.16	Very Good	▲
2	Madhav NP	2006-2009	51.5	Fair	2018-2019	76.6	Very Good	▲
3	Bagdara WLS	2015-2017	47.5	Fair	2020-2022	55.47	Fair	▲
4	Dinosaur Fossil NP	-	-	-	2020-2022	69.23	Good	▲
5	Ghatigaon WLS	2015-2017	51.67	Fair	2020-2022	50.81	Fair	▼
6	Ken Gharial WLS	2015-2017	69.17	Good	2020-2022	58.06	Fair	▼
7	Nauradehi WLS	2009-2010	59.38	Fair	2020-2022	57.81	Fair	▼
8	Ratapani WLS	2006-2009	52.3	Fair	2020-2022	67.19	Good	▲
9	Fossil NP	2017-2018	78.13	Very Good	2022-2023	54.69	Fair	▼
10	Gandhi Sagar WLS	2017-2018	58.62	Fair	2022-2023	52.34	Fair	▼
11	Kheoni WLS	2017-2018	50	Fair	2022-2023	64.84	Good	▲
12	Narsighgarh WLS	2017-2018	53.45	Fair	2022-2023	52.42	Fair	▼
13	National Chambal WLS	2017-2018	67.5	Good	2022-2023	59.38	Fair	▼
14	Orcha WLS	2017-2018	62.96	Good	2022-2023	43.75	Fair	▼
15	Van Vihar NP	2017-2018	91.67	Very Good	2022-2023	88.33	Very Good	▼
16	Phen WLS	2015-2017	82.5	Very Good	2023-2024	85.16	Very Good	▲
17	Ralamandal WLS	2018-2019	68.33	Good	2023-2024	71.09	Good	▲
18	Sailana WLS	2018-2019	64.29	Good	2023-2024	64.84	Good	▲
19	Sardarpur WLS	2018-2019	50.89	Fair	2023-2024	60.16	Good	▲
20	Singhori WLS	2018-2019	56.03	Fair	2023-2024	60.16	Good	▲
21	Son Gharial WLS	2018-2019	63.33	Good	2023-2024	71.09	Good	▲
22	Veerangana Durgavati WLS	2018-2019	67.24	Good	2023-2024	64.84	Good	▼
23	Karera WLS	2012-2013	33.33	Poor	-	Denotified -	-	-
24	Pachmarhi WLS	2018-2019	80.83	Very Good	-	TR	-	-

# Maharashtra



Black Francolin (Female) © Vivek Sankar



## Maharashtra

Maharashtra, located in western India, spans a geographical area of approximately 307,713 Km<sup>2</sup>. The state's forest cover is 50,858.53 Km<sup>2</sup>, accounting for 16.53% of its geographic area (ISFR 2023). In the first cycle of MEE, a total of 31 PAs are assessed. In the repeat cycle, 34 PAs are evaluated, including 7 newly added PAs. Five PAs are excluded from the assessment—two classified as CMPAs, two falling under TR category, which are assessed separately, and one PA is excluded as it is not under the control of the FD.

### 1. Sanjay Gandhi (Borivilli) NP, Maharashtra (2018-19):

The PA was notified in 1996. Extending over 86.79 Km<sup>2</sup>, with an additional 16.72 Km<sup>2</sup> as a non-notified area, the PA also has an ESZ notified in 2016. It is home to over 1,300 species, including the highest recorded densities of leopards in Indian PAs. The area is well-endowed with water sources and features archaeological and religious sites, making it a popular destination for visitors. Approximately 40% of the boundary is fenced with a 10-foot-high wall, and the management has adequate staff, including a veterinary healthcare center and a proficient rescue team.

However, the PA faces significant challenges, such as encroachments affecting around 25,000 families on the periphery and about 1,900 families within the PA. Management issues include unregulated roadside hawkers, stray dogs, invasive weeds, political interference, trespassing into core areas, garbage accumulation, inadequate housing for staff, and a lack of dedicated veterinary hospital facilities.

**Recommendations** - Recommendations for improvement include expediting court proceedings to

remove encroachments, controlling stray dogs and invasive weeds, enhancing education and awareness programs, regulating tourism and hawker activity, introducing battery-operated vehicles in tourist areas, constructing a dedicated veterinary hospital, increasing protection chowkies, establishing a canteen and souvenir shop run by EDCs, and improving staff training.

### 2. Bhimashankar WLS, Maharashtra (2020-22):

The PA, 138.75 Km<sup>2</sup> was notified in 1985. Situated at the crest of the Western Ghats, and composed of predominantly semi-evergreen forests, with a few patches of near virgin evergreens, the PA is home to a number of endemic and endangered species, including the Giant Squirrel, the state animal of Maharashtra. Region of high rainfall, the PA feeds two tributaries of river Krishna, and two reservoirs downstream. Proposal for final notification has been submitted, approved management plan is in place and the ESZ has also been notified. High cultural and religious values, as the famous Bhimashankar temple, along with many others, is situated within the PA. It has excellent tourism and nature education opportunities. Nine EDCs have been

constituted, of which three are actively engaged in temple tourism management.

Presence of Bhimashankar temple brings huge numbers of pilgrims with associated problems of litter and pollutants, and constant demand for land to create facilities for pilgrims. There are nine villages in the PA and 26 in the periphery. The traditional practice of 'rab' leads to accidental fires, some areas experience grazing by cattle and illegal felling, and there have been reports of poaching of Sambar Deer from Thane side.

**Recommendations** - Recommendations include obtaining the final notification of the PA after resolving any discrepancies regarding the area; enhancing research and monitoring efforts for key species; improving facilities, skills, and knowledge of front-line staff to strengthen management; planting fruit trees to provide better feeding sources for the Giant Squirrel; strengthening the functioning of EDCs; and actively pursuing the constitution of conservation and community reserves adjacent to the PA.

### 3. Chaprala WLS, Maharashtra (2020-22):

The PA covers 134.78 Km<sup>2</sup> and was notified in 1986. It is located near the Telangana border in Garhchiroli District and serves as a connection between Tadoba Andhari TR and Indravati TR in Chhattisgarh through neighboring forest divisions. The PA features central Indian mixed tropical deciduous forests, predominantly consisting of Teak, and has significant watershed value. It is managed according to the prescriptions outlined in the management plan of Tadoba TR. A management plan is in place, and an ESZ was notified in 2020. The PA is recognized for its floral and bird diversity, and the local community is generally supportive of conservation efforts.

However, there are five villages within the PA and 22 on the periphery, which exert extensive biotic pressure due to their subsistence dependence on the PA's resources. Additionally, the sanctuary suffers from a poor protection network and inadequate visitor facilities, publicity, and scientific information, which further weaken management.

**Recommendations** - Recommendations include reviewing the management plan; improving tourism facilities near the Prashant Dham temple; enhancing visitor management and nature interpretation strategies; improving scientific research and monitoring efforts; and strengthening linkages with civil society to facilitate better conservation practices.

### 4. Dhyanganga WLS, Maharashtra (2020-22):

The PA covers 205 Km<sup>2</sup> and is part of the Ajanta hill ranges in the Deccan Trap, featuring two lakes within its boundaries. The sanctuary consists of southern tropical dry deciduous forests, predominantly dominated by Teak, and is home to Sloth Bears, wolves, and hyenas, along with a variety of medium to small prey species. It serves as the catchment area for three reservoirs downstream. The PA is administered by the Field Director of Melghat TR and benefits from good staff numbers and protection networks. An approved management plan is in place, and an ESZ was notified in 2017. The habitat and water management practices are effective, and local villagers are supported through livelihood generation programs. The PA features excellent eco-tourism facilities and programs, which are managed by EDCs, alongside effective protection through an intelligence network.

Despite these strengths, the sanctuary is surrounded by 27 villages, housing about seven lakh sheep, which exerts massive grazing pressure on the area. The Deputy Conservator of Forests (DCF) office is located approximately 100 km away, causing administrative difficulties. Additionally, the lakes are not under the administrative control of the FD, although there are potential sites for promoting water sports in the surrounding areas. Other challenges include inadequate scientific research and delays in the release of funds.

**Recommendations** - Recommendations include improving the flow of funds, enhancing research and monitoring efforts—particularly focused on key predator species, upgrading eco-tourism infrastructure, engaging more EDCs to control grazing, and eradicating invasive weeds.

### 5. Ghodazari WLS, Maharashtra (2020-22):

The PA was established in 2019 and extends to 159 Km<sup>2</sup>. It features southern tropical dry forests and includes Ghodazari lake, located at its center. The sanctuary connects Tadoba Andhari TR and Umred Karhandala WLS. The relatively undisturbed water body serves as an excellent habitat for migratory birds and reflects the diversity of flora and fauna typical of tropical dry forests. An approved management plan is in place, and the PA is a popular eco-tourism destination with good accessibility. While boating facilities are provided by the irrigation department, the area is administered by the Brahmapuri territorial



division and is known for good tiger sightings. There has been effective eco-development work and eco-tourism support through local EDCs, including guides.

However, the PA faces significant challenges due to heavy biotic pressure from 39 villages located outside and 2 villages inside the sanctuary. The reservoir and draw-down area fall under the jurisdiction of the irrigation department, resulting in coordination issues regarding tourism facilities, such as guest houses and boating, which are also managed by the irrigation department.

**Recommendations** - Recommendations include transferring administration of the PA to the wildlife division, allocating sufficient funds and ensuring their timely release, improving the prey base, building a comprehensive eco-tourism program in consultation with the irrigation department, transferring the Ghodazari Guest House to the FD, developing the existing tourism complex for nature interpretation and

education, and improving information dissemination regarding the Ghodazari dam.

## **6. Great Indian Bustard WLS, Maharashtra (2020-22):**

The reconstituted PA covers 366.73 Km<sup>2</sup> and was notified in 2016. An additional area of 1.98 Km<sup>2</sup> has since been notified as New Maldhok Sanctuary to extend the habitat for GIB. This PA is the only one protecting bustards in Maharashtra and comprises a dry scrubland-grassland-savannah system that supports associations with wolves and blackbucks. The landscape features a mosaic of different land uses, including patches of RFs, rain-fed agricultural areas, intensively canal-irrigated croplands, wastelands, and fuelwood plantations, all hosting many endangered grassland fauna, including birds. The PA serves as a roosting place for Harriers, although it was once a good habitat for Bustards, which are now extinct. WII is conducting studies on GIB, and local NGOs in



Leopard © Vivek Sarkar

Sholapur collaborate with PA management on anti-poaching and nature education initiatives. A management plan, covering both the PA and the additional area, is in place.

Despite these strengths, the sanctuary faces significant challenges, including overall degradation of grasslands and fragmented habitats for GIB. Land use changes favor irrigated cash crops, while some RFs contain old plantations that are encroaching on grass and scrub vegetation. The area suffers from acute water shortages in the summer and profuse growth of weeds. Although the PA has been widely studied, the findings from research have not been applied effectively in management practices. Community support for conservation efforts is lacking, and funding remains poor.

**Recommendations** - Recommendations include implementing the recommendations made in the WII study titled "Tracking of GIB (*Ardeotis nigriceps*) and

Mapping Its Potential Habitat across the Deccan Landscape, Maharashtra," undertaking silvicultural operations in old plantations to control their spread, removing invasive weeds, improving water availability within the PA, establishing community-based conservation and livelihood programs, enhancing fund flow, bolstering staff capacities, and improving research, monitoring, and nature education programs. Additionally, the creation of a GIB captive breeding program should be examined.

### 7. Karnala Bird WLS, Maharashtra (2020-22):

Karnala Bird WLS, notified in 1991, spans 12.15 Km<sup>2</sup> and is located on either side of the Mumbai-Goa Highway, close to Panvel. The sanctuary features moist deciduous vegetation and attracts both resident and winter migratory birds. A proposal has been submitted to the competent authority to add 6.85 Km<sup>2</sup> from the Alibag Forest Division to enhance ecological contiguity. The PA serves as a catchment area for the Patalganga river and the dam built over it. The biodiversity within the sanctuary is rich, especially given its proximity to the metropolitan area of Mumbai. A management plan is in place, and the sanctuary operates with full staff strength. Local villagers have formed four EDCs, with two women's SHGs managing tourism and nature education, and tourism revenue is reinvested for management. An ESZ was notified in 2016, and the sanctuary boasts good signage and facilities.

However, 13 families live within the PA, having agricultural lands along its periphery, and there are six villages bordering the sanctuary. The area is facing rapid invasion by invasive weeds.

**Recommendations** - Recommendations include following up on the addition of the area from the Alibag division, providing funds as proposed in the management plan, eradicating invasive weeds, and relocating the 13 families at the earliest since the villagers are willing to move out.

### 8. New Maldhok Bird (Gangewadi) WLS, Maharashtra (2020-22):

New Maldhok Bird (Gangewadi) WLS was notified in 2015 and is situated in the Gangewadi grasslands of Solapur district. The sanctuary was reorganized based on recommendations from an expert committee constituted in 2007. The newly notified area of 1.98 Km<sup>2</sup> near the GIB WLS is deemed critical for the conservation of the GIB and, in conjunction with the GIB WLS, offers a potential habitat for building up the



*Black-capped Kingfisher © Niket Alashi*

GIB population in the area, which had sightings as recently as 2011.

The sanctuary faces challenges from fragmented habitats and degraded grasslands. However, management efforts have focused on building participatory programs with local communities to protect the area. The current management plan integrates both the New Maldhok and GIB Wildlife Sanctuaries, providing prescriptions applicable to both.

**Recommendations** - Recommendations include ensuring the timely implementation of the management plan; providing necessary funds for management activities; eradicating invasive weeds.

### 9. Phansad WLS, Maharashtra (2020-22):

Phansad WLS was notified in 1986 and extends to 69.79 Km<sup>2</sup>. The sanctuary spans across two biogeographically important regions: the Northern Sahyadri and the West Coast region. Crisscrossed by 27 perennial streams, it serves as a corridor between these two regions, showcasing a rich biodiversity that represents the flora and fauna of both areas in one location. Previously, the PA was a princely property and served as a hunting reserve for the aristocracy. It is home to the state animal, the Indian giant squirrel, and contributes to the water supply for three dams constructed downstream. While the management plan is pending approval, an ESZ was notified in 2017. The sanctuary holds excellent aesthetic and religious values, and a comprehensive eco-tourism plan has been prepared and submitted to various funding

agencies. Eco-tourism is well managed, with local communities assisting through EDCs. Additionally, a highly empowered women's SHG efficiently manages boarding and lodging facilities for visitors, with the staff numbers, training, and deployment being satisfactory.

Despite these strengths, the PA faces significant challenges due to being an island of greenery in a predominantly human-dominated landscape. There are 26 villages with associated cattle, roads, and markets, as well as 37 families residing on agricultural lands within the PA without settled rights, which contribute to various management issues. Habitat degradation, illegal movement of people and cattle, HWC, marginal encroachments, and inadequate mobility for staff compound these problems.

**Recommendations** - Recommendations include obtaining approval for a 23-km long chain-link fence around the PA to enhance protection, securing approval for the draft management plan, expanding eco-development programs through EDCs to improve livelihoods while widely distributing eco-tourism opportunities, obtaining approval for the Detailed Project Report (DPR) for eco-tourism development in the area, improving mobility and communication support for staff, ensuring timely release of funds, and enhancing habitat management efforts.

### 10. Pranhita WLS, Maharashtra (2020-22):

Pranhita WLS was notified in 2014 and covers an area of 418 Km<sup>2</sup>, spread across the states of Maharashtra and Telangana. The sanctuary is connected to Indravati TR

through the Kolamarka Conservation Reserve, although the connectivity is tenuous. The PA has significant biodiversity and catchment values, making it an important ecological area.

Situated predominantly in a tribal area within Garhchiroli district, the PA is exposed to left-wing extremism, which contributes to challenges such as poor road connectivity and an inadequate protection network. Most of the area remains inaccessible, and it is administered under the Brahmagiri territorial division, lacking exclusive wildlife staff.

**Recommendations** - Recommendations include transferring the administration of the PA to the wildlife wing, along with the corresponding transfer of posts and staff, creating dedicated posts for ROs specific to the PA, improving the numbers and capacities of staff in wildlife management, and establishing a dialogue with tribal communities to assist them in improving their livelihoods, especially given the area's left-wing extremism. Additionally, local volunteers should be utilized as part of the protection and monitoring team and equipped appropriately, and opportunities for rewilding the area with a native ungulate prey base should be explored.

## 11. Sudhagad WLS, Maharashtra (2020-22):

The PA was notified in 2014, covering an area of 77.12 Km<sup>2</sup>, which was carved out from three territorial divisions along with a small portion of acquired private land. Located in the Western Ghats, the PA possesses significant biodiversity and water catchment values, and the historic Sundargarh Fort is situated within its boundaries. In 2021, the management of the area was transferred to the Thane Wildlife Division. While there is no dedicated management plan in place, the entire area is included in the protection working circles of the respective working plans. There are 13 Joint Forest Management Committees (JFMCs) in the villages surrounding the PA, and the area holds good potential for eco-tourism.

However, the PA does not have a management plan, and it faces challenges due to 17 villages on its periphery and three tribal hamlets within the PA, with their cattle heavily dependent on its resources for subsistence. The area suffers from an acute shortage of staff and funds, and there are issues such as a monkey menace at Sundargarh Fort, as well as widespread weed infestation.

**Recommendations** - Recommendations include filling all posts of frontline staff and creating additional positions to strengthen protection; appointing a full-

time RO for the PA; improving overall protection infrastructure and enhancing staff skills and knowledge; preparing a comprehensive management plan; developing eco-development programs that focus on improving the livelihoods of dependent communities; establishing a community-based eco-tourism and nature education program at Sundargarh Fort; and improving habitats within the PA.

## 12. Tamhini WLS, Maharashtra (2020-22):

The PA was notified in 2013, having been carved out from 49.62 Km<sup>2</sup> of land in the Pune and Raigarh territorial divisions, and is placed under the Thane Wildlife Division. Located in the Sahyadri part of the Western Ghats, the PA boasts a significant assemblage of endangered and endemic flora and fauna, including the state animal, the Indian Giant Squirrel, and the state butterfly, the Blue Mormon. It has high watershed values and features outstanding scenic beauty, especially during the monsoon season, as well as well-known sacred groves and a few religious sites that attract numerous tourists. The management plan and ESZ are in place, and there are no human settlements within the PA; meanwhile, the surrounding human habitations have minimal dependence on its resources. There are two EDCs, although they are not very active.

However, the terrain is hilly, and the core area of the PA becomes inaccessible during the monsoon, making it vulnerable to unwanted activities. Development of meadows is challenging due to the hilly terrain and dense woodlands. Additionally, HWC is high in the peripheral areas, and there are inadequacies regarding the timely release of funds.

**Recommendations** - Recommendations include encouraging management-related studies in consultation with scientific institutions, improving habitats and increasing the prey base, filling all staff vacancies, and enhancing protection infrastructure. It is also essential to develop income generation activities for local communities by utilizing eco-tourism opportunities, encouraging the establishment of more EDCs, and instituting participatory protection and livelihood improvement programs. Lastly, ensuring timely and sufficient funds for these initiatives is crucial for effective management.

## 13. Tansa WLS, Maharashtra (2020-22):

The PA extends over 304.81 Km<sup>2</sup> and has been notified through multiple notifications since 1970. It plays a crucial role in feeding several rivers, streams, and the reservoirs of the Tansa and Modaksagar dams, which

supply drinking water to the city of Mumbai and nearby regions. The lakes, surrounded by tropical moist deciduous forests, feature numerous historical, cultural, and religious sites, as well as scenic beauty, making this PA a popular tourist destination. As part of a larger forested landscape, the PA has significant floral and faunal values. Although a management plan is in place, the ESZ notification is still pending. There are four tourism sites within the PA that cater to urban tourism needs, and 10 active EDCs assist in management, protection, and tourism activities, including the operation of a canteen at Mahuli Fort.

Historically known for its free-ranging mega fauna, the PA now experiences very low densities of major ungulates. There are five revenue villages within the PA, which, although excluded from the official notification, rely on the sanctuary for their agricultural and livelihood needs. This reliance has resulted in high disturbance levels, along with issues such as illicit felling and poaching of small animals and birds. The non-settlement of rights for these communities is a significant factor delaying the issuance of the final notification. Additionally, the two lakes are excluded from the PA limits and are under the control of the municipal body. Challenges include high social conflict, high unemployment among youth, a significant number of staff vacancies, inadequate protection networks, lack of demarcated boundaries, a large population of stray dogs, and the threat of a dam over the Gargei river. While 45 spotted deer were released in 2016 and 2018, the lack of scientific monitoring and appropriate protection measures has hindered successful rewilding efforts.

**Recommendations** - Recommendations include preparing a landscape-level perspective plan to integrate the PA into a larger landscape that includes several RFs and other PAs, expediting the issuance of the final notification and the ESZ for the PA, declaring the Tansa and Modaksagar lakes as conservation reserves to enhance protection for migratory birds and aquatic flora and fauna, establishing proper zonation within the PA, using the forest owlet as a conservation icon to attract financial support and protection initiatives from civil society, rewilding the area with native herbivores following proper protocols, filling staff vacancies, improving funding, enhancing interpretation and nature education programs, developing village eco-development programs to strengthen management, and improving coordination with the Bombay Municipal Corporation to maximize conservation benefits.

## 14. Aner Dam WLS, Maharashtra (2022-23):

The PA extends to 82.96 Km<sup>2</sup> and was notified as a WLS in 1986. An ESZ surrounding the PA was notified in 2019. The sanctuary serves as an important habitat for Chinkara and wolves and historically represents a rich wildlife area. The dry deciduous-savannah formations within the PA provide ideal habitats for several endangered and threatened wildlife species. The dam area, located within the sanctuary, is a popular tourist destination and the PA possesses high hydrological, archaeological, cultural, and religious values. It is connected to Melghat TR through tenuous corridors and maintains 70 waterholes to meet the needs of wildlife.

However, the final notification of the PA is still awaited due to delays in the settlement of FRA claims. Habitat fragmentation occurs due to the presence of two revenue villages, six unauthorized settlements, and 839 illegal cultivators, of which rights for only 250 have been settled. The remaining claims are yet to be resolved, preventing boundary demarcation on the ground. Additionally, the PA faces heavy livestock grazing from neighboring villages and migratory cattle, as well as issues such as water scarcity, inadequate funding, the proliferation of weeds, low herbivore density, and insufficient outreach, which collectively weaken management efforts.

**Recommendations** - Recommendations include demarcating areas settled under the FRA, systematically eradicating weeds, and restoring vegetation with palatable grasses, herbs, and shrubs; planting *Acacia nilotica* in shallow water zones; exploring possibilities to rewild the PA with deer and small mammals; engaging with local communities to plan and implement participatory programs that support PA protection and improve local livelihoods; regulating entry to the PA more effectively; improving staff training; creating a comprehensive PA database; enhancing nature education, awareness, and interpretation programs; preparing a Zonal Plan for the ESZ; and improving fund availability for management activities.

## 15. Bhamragarh WLS, Maharashtra (2022-23):

The PA covers 104.38 Km<sup>2</sup> and is situated in the picturesque valleys and lush green hills of the eastern plateau of the Deccan Peninsula. It was notified in 1997 and supports dense moist mixed tropical forests rich in

biodiversity. The PA holds high conservation value due to its proximity to the Indravati TR in Chhattisgarh, providing continuous habitats for tigers, wild buffalo, and other associated fauna. It is a source for several perennial rivers and has significant cultural value as it is home to the Madiya Gond indigenous tribe. The area has maintained its serenity due to poor connectivity to the outside world, and an ESZ has been notified. The Flying Giant Squirrel is common, and Jerdon's Courser has been reported to be present within the PA.

However, the PA is largely inaccessible to both staff and the public due to the significant presence of left-wing extremism. Regular patrolling has not been carried out for an extended period, and forest personnel are unable to visit the sanctuary for protection or development activities. Protection infrastructure is weak, and there is a lack of information regarding the status of wildlife in the area. There is one village of Madiya Gond within the PA and several others nearby. These communities are economically disadvantaged, depend on the PA for their livelihoods, and participate in annual ritual of hunting.

**Recommendations** - Recommendations include actively engaging with local tribes, social workers, and other influential individuals to facilitate safe entry and movement within the PA; involving local agencies like Lok Biradari Prakalp in developing conservation and development programs in Madiya villages; selecting students from Bhamragarh or Hemalkasa and training them in nature conservation to build a support group for the PA; preparing a management plan considering the prevailing situation; training staff in participatory management and planning, and implementing eco-development programs.

## 16. Deulgaon-Rehekuri WLS, Maharashtra (2022-23):

This tiny PA spans only 217.31 hectares and was notified in February 1980 to protect the remnants of savannah-grassland habitat (tropical thorn forests) and its wildlife, which once extended widely before being converted to agricultural lands. The PA has an approved management plan, which is an integral part of the management plan for the GIB Sanctuary. Historically, the area supported good populations of the GIB and Lesser Florican, along with wildlife such as Blackbuck, Chinkara, and Indian Wolf. Unfortunately, Bustards and Floricans have not been observed for a long time. The PA is well connected to cities like Pune, attracting visitors, and it has adequate staff and protection infrastructure.

However, the PA is surrounded by a human-dominated landscape and experiences significant biotic pressure. A state highway proposed for widening runs through the sanctuary, causing fragmentation. The grasslands are degraded, extensively covered with plantations of Neem and *Eucalyptus*, and suffer from heavy weed infestation. The blackbuck population is vulnerable to accidental deaths on roads and in open agricultural wells, and they are often chased by domestic dogs.

**Recommendations** - Recommendations include preparing a plan for the restoration of grasslands, restoring habitats for Blackbuck, increasing the size of the PA by incorporating neighboring forest areas and intervening lands, improving livestock disease surveillance and vaccination for cattle, exploring the possibility of conservation breeding for native grassland animals, and developing community-linked conservation and development programs.

## 17. Gautala-Autramghat WLS, Maharashtra (2022-23):

The PA covers 218.77 Km<sup>2</sup> in the Marathwada region and was notified as a WLS in 1986, with an ESZ notified in 2016. The PA predominantly consists of tropical dry Teak forests and riverine forests along the banks of rivers and streams. An isolated patch of grassland, extending to 950 hectares, is home to about 1,000 Blackbucks and a few wolves. The long ridge of the PA separates the basins of the Tapi and Godavari rivers and connects with Dhyanganga WLS through forest corridors. The Pithalkhora cave, an outstanding cultural site, along with numerous archaeologically significant caves and temples, attracts a large number of tourists. The government has included the PA in the Ajanta-Ellora tourism circuit. It is well protected, with an approved management plan, systematic camera monitoring of wildlife and waterholes, active eco-development programs, effective nature education initiatives, and technology-based patrolling. A male tiger moved into the area in 2021 and has been residing there since.

However, the sanctuary is surrounded by 30 villages and wadis that house a cattle population of about 27,000. Due to the lack of alternative grazing areas for villagers, the PA continues to experience livestock grazing pressure. Additionally, there is a significant influx of pilgrims and tourists visiting various temples and archaeological sites, especially during the Yatra Mahotsav of Patnadevi temple, attracting approximately 200,000 people. The linear shape of the PA, characterized by vertical cliffs and slopes, reduces

available space for ungulates. The presence of invasive weeds, roads adjacent to the PA, and the threat of marginal encroachments further challenge management efforts.

**Recommendations** - Recommendations include preparing and implementing a systematic management plan for the isolated grassland inhabited by Blackbucks; initiating a systematic weed removal project; ensuring that roads bordering the PA are safe for animal crossings; planting fruit-bearing trees where needed; expanding eco-development programs by identifying and developing some villages as 'solar-powered villages'; preparing a zonal plan for the ESZ and exploring the addition of neighboring forests to the PA; enhancing visitor facilities to accommodate the rising number of visitors; and planning for the rewilding of the PA with native ungulates.

## 18. Jaikwadi Bird WLS, Maharashtra (2022-23):

The Jaikwadi Dam, covering a massive water spread area of 339.79 Km<sup>2</sup> across the Godavari River, was established by acquiring lands from 118 villages in Aurangabad and Ahmednagar districts. The PA was declared to safeguard the rich bird and aquatic life within it. It was notified in 1991. Recognized as an IBA and part of the CAF, the PA was designated as a Ramsar site in 2013, hosting around 264 species of birds, including 80 migratory species, with significant populations. The area includes approximately two dozen islands that provide excellent nesting and breeding habitats for wintering birds and serves as a vital source of water for surrounding villages and towns. The PA management has developed good bird-watching facilities and involves numerous local and national institutions in annual bird counts, as well as in education, awareness, and training programs.

However, due to the lengthy process of rights settlement, the PA continues to experience substantial resource use pressure from neighboring communities. Approximately 2,500 to 3,000 families engage in seasonal cultivation across about 10,000 hectares of exposed reservoir area. There are 27 fishing cooperatives with around 5,000 registered members, alongside more than 2,000 individuals reported to be illegally fishing. Additionally, about 4,000 farmers are involved in lift irrigation through 41 cooperatives. The PA also supports 27 drinking water schemes and 7 industrial water schemes. Visitor facilities do not meet the volume and needs of incoming guests. There is an acute shortage of staff and funds, hindering the

realization of management objectives. High levels of PA-people conflict arise due to the varied needs of multiple stakeholders.

**Recommendations** - Recommendations include preparing a consultative management plan involving all governmental and non-governmental stakeholders to ensure proper spatial allocation of the water body that supports local livelihoods while protecting bird and aquatic wildlife. It is suggested to declare about 10% of a suitable site as a Preservation Zone, permitting only community-based eco-tourism and nature education. Additionally, increasing staff strength, improving protection infrastructure, enhancing bird-watching infrastructure and programs, and involving local and national institutions for the systematic preparation of a biodiversity inventory and monitoring of water quality and bird populations are essential. Protection measures for the islands during the wintering period should be implemented, along with training for local residents in eco-tourism and other livelihood improvement activities. Lastly, improving the availability of funds is crucial for effective management.

## 19. Kalsubai-Harishchandragad WLS, Maharashtra (2022-23):

The PA was initially notified in 1986, covering 361.81 Km<sup>2</sup>, including 32 tribal villages. Following the settlement process, a final notification was prepared for an area of 299.09 Km<sup>2</sup>, which encompasses 116.74 Km<sup>2</sup> of land from 24 villages; however, the final notification is still pending issuance. An ESZ was notified around the PA in 2017. The sanctuary is a unique example of collaborative management, with villagers acting as equal partners in PA protection and management. The EDCs run successful eco-tourism programs in areas that belonged to them before notification. The tourism management and revenue-sharing rules clearly define the roles, responsibilities, and accountability of both parties involved.

The PA boasts high biodiversity, hydrological, cultural, religious, archaeological, and aesthetic values, attracting more than 150,000 visitors annually for wilderness experiences, mountain hiking, camping, and visits to attractions such as Harishchandragad Fort and Sandhan Valley. Additionally, the highest peak of Maharashtra, Kalsubai, is located within the WLS, and more than 10 sacred groves are protected by the EDCs in collaboration with forest officials.

Despite these strengths, pending final notification, 40% of the PA comprises private land occupied by 24

villages, engaged in paddy and Ragi cultivation in the valleys and shifting cultivation in the hills. Local cattle graze within the PA, and the communities' fuel and small timber needs are sourced from the area. Marginal encroachment issues persist, and several claims under the FRA have been accepted. Management is weakened by problems related to staff mobility and communication, as well as a low density of ungulates.

**Recommendations** - Recommendations include planning for future collaborative management of the PA, particularly after the relocation of people following the issuance of the final notification; engaging EDCs in Soil Moisture Content (SMC) and habitat improvement projects; completing surveys and demarcation as soon as possible; improving staff mobility, communication, and capacities; organizing nature education programs for local youth and training them to become knowledgeable PA guides; and discouraging unwanted constructions within the PA.

## 20. Kanhargao WLS, Maharashtra (2022-23):

The PA comprises approximately 269.4 Km<sup>2</sup>, with about 90% of the area being dominated by Teak plantations that were managed by the Forest Corporation in the past. It was notified as a WLS in 2021 due to its ecological role in connecting Tadoba-Andhari TR through Tipeshwar WLS to Pakhal TR in Telangana. This prime plantation area features well-laid-out roads and records of various plantations, with the Wardha river forming the boundary of the sanctuary. The PA supports significant wildlife, including an estimated 10 to 12 tigers.

Prior to its notification, the area provided substantial employment to local communities through various forestry operations year-round. However, the loss of employment and restrictions on resource use and access to the PA have led to hostility toward management from the local population. The areas remain under the administrative control of the Forest Corporation and the Chandrapur Division for their respective territories, resulting in the absence of an independent wildlife administration. Intense local agitations against the PA's notification prompted a submission by local officers in 2022 for the denotification of the area, leaving the existence of the PA surrounded by uncertainties.

**Recommendations** - Recommendations include convening a meeting of the three wings of the FD—Forest Corporation, Territorial Administration, and Wildlife Administration to eliminate uncertainty

regarding the PA's status; using examples from other regions to manage monoculture plantations as wildlife habitats through silviculture operations; organizing local communities into EDCs and developing income-generating activities such as eco-tourism; and improving the availability of food, fodder, and water for the existing population of wild animals in the sanctuary.

## 21. Karanja Sohal (Blackbuck) WLS, Maharashtra (2022-23):

The PA spans 18.32 Km<sup>2</sup>, including 0.57 Km<sup>2</sup> of private land, and was notified as a WLS in 2000, primarily to protect the Blackbuck and associated fauna. It represents southern tropical dry deciduous forests interspersed with grasslands and savannah-like formations, creating a rich tapestry of biodiversity. The presence of the Aadan reservoir enhances both the hydrological and aesthetic value of the PA, attracting migratory birds. In addition to its ecological significance, the sanctuary holds substantial cultural and archaeological value, featuring old temples and ruins that attract a considerable number of visitors. It is a well-PA with an ESZ notified and a management plan in place.

However, the PA is fragmented and surrounded by human habitations, with two state highways passing through, compounding management challenges. HWC occurs due to crop depredation by Blue Bulls and wild pigs. Proliferation of non-palatable weeds, inadequate financial support, and insufficient publicity along with the undulating terrain present further difficulties in achieving management objectives.

**Recommendations** - Recommendations include increasing the size of the PA by lawfully acquiring agricultural lands from willing landowners, preparing and implementing a plan to develop patches of short grasses to support Blackbuck populations, establishing proper fire lines within the PA, creating a regular wildlife monitoring protocol, arranging safe wildlife crossings along state highways, systematically eradicating non-palatable weeds, and organizing regular nature education camps for students and local youth.

## 22. Katepurna WLS, Maharashtra (2022-23):

The PA was notified in 1988 and originally covered 73.69 Km<sup>2</sup>, consisting of approximately 60% RFs and the remainder made up of private and revenue lands. However, according to revenue records, the actual extent of the PA is only 57.44 Km<sup>2</sup>. An ESZ surrounding the PA was notified in 2021. The PA predominantly

features southern tropical dry deciduous forests, with Teak dominating many areas, and it supports a range of associated fauna. It has a linear shape and is bisected by the Katepurna river, which forms a large reservoir near the boundary and attracts migratory birds and tourists. The sanctuary contains several natural and man-made water bodies and connects Melghat TR and the Satpura hills through tenuous forest corridors and agricultural lands.

Management is supported by functional inter-departmental relations, seven EDCs in peripheral villages, decent visitor amenities, and interpretation materials. The PA also has a dedicated website, which enhances its effectiveness.

Nonetheless, the small size and linear shape of the PA expose it to heavy human-cattle interfaces. The high density of Teak limits fodder availability, and there is a low density of ungulates. The sanctuary also suffers from invasive aggressive weeds, annual fires, the presence of roads in and around the PA, inadequate scientific research and monitoring, and fragmented corridors that add to the management challenges.

**Recommendations** - Recommendations include appointing a RO exclusively for the PA, improving staff training, mobility, and amenities, managing Teak areas as wildlife habitats through silvicultural operations, organizing nature camps for school children and local youth, enhancing eco-development programs to generate revenue for the EDCs and conservation efforts, exploring possibilities for acquiring private lands adjacent to the PA to expand wildlife habitats and secure corridors, systematically organizing habitat and water improvement programs including weed removal and involving local NGOs, voluntary groups, and local institutions in periodic wildlife monitoring and nature education.

### 23. Lonar WLS, Maharashtra (2022-23):

Lonar Crater WLS was notified in 2000 and extends to 383.22 hectares. Formed by a meteorite impact approximately 52,000 years ago, the sanctuary is a Ramsar site and a National Geo-Heritage Monument. This unique geomorphological landscape is saucer-shaped, featuring a ridge cum plateau on top, forested tracts on the slopes, and a saline lake at the bottom. Located near State Highway 171, the crater is believed to be the third largest of its kind in the world, with a crest diameter of 1,800 meters and a depth of 150 meters, at the base of which lies an 1,100-meter-wide saline lake. The vegetation predominantly consists of tropical dry deciduous forests, and the sanctuary holds

archaeological and cultural significance, attracting many visitors to various ancient ruins and temples in and around the crater. A high-level committee coordinates with several stakeholders to oversee management, and two EDCs have been established in the surrounding villages.

However, the PA is more an object of wonder and curiosity than a vital habitat for critical wildlife species. The saline water supports various blue-green algae, but only a few bird species utilize the lake. Additionally, the lake functions as a dumping area for local sewage, albeit treated. The proliferation of *Prosopis* in the area poses another challenge, along with the task of regulating the high volume of pilgrimages to the site.

**Recommendations** - Recommendations include continuing the ongoing removal of *Prosopis* and other invasive weeds, relocating the nature interpretation center to a more frequently visited site and upgrading its displays and interactive information materials, dismantling unused old buildings and reusing their materials to construct new environmentally friendly structures for eco-tourism and nature education, developing appropriate nature trails, preparing a zonal plan, and conducting studies on wildlife abundance, water characteristics, and the ecology of the area.

### 24. Mayureswar Supe WLS, Maharashtra (2023-24):

The PA extends to 5.14 Km<sup>2</sup> and was notified on August 19, 1997. A few patches of RFs situated in two adjoining villages are in the process of being included in the PA. There are no villages within the sanctuary, making it easily accessible from Pune, and it is well-known for the Mayureshwar Temple, one of the first Ashtavinayak temples. The PA features dry deciduous scrub forests and some tree plantations that provide habitats for 938 species of flowering plants, as well as several mammals such as the Indian Gazelle (Chinkara), Striped Hyena, and Indian Gray Wolf. Bird species include the Indian Courser, Black-winged Kite, Eurasian Collared Dove, Bonelli's Eagle, and various migrants like the European Roller and Montagu's Harrier. The area also hosts an important nature education center and an interpretation center, attracting many visitors and offering good amenities. Additionally, the PA is equipped with an e-surveillance system and has two functioning VFCs supported by NGOs.

However, the management plan for the PA is still awaiting approval. The sanctuary faces challenges including livestock grazing, heavy traffic from nearby highways, the presence of stray dogs, and

inadequacies in staff numbers and funding. There is also an absence of ecological monitoring, issues related to crop depredation by wild animals, and limited participation from local communities in management activities.

**Recommendations** - Recommendations include obtaining approval for the revised management plan, improving staff strength, skills, and amenities, reinforcing community development and grazing control through eco-development initiatives, understanding and improving the availability of fodder and water for wild herbivores, enhancing the Grass Seed Bank, controlling the number of stray dogs, implementing entry ticket fees for information and publicity, developing visitor facilities at the entry gate, and improving displays and general publicity about the PA.

## 25. Naigaon Peacock WLS, Maharashtra (2023-24):

The PA is located in the drought-prone Marathwada region of Beed district and covers 29.94 Km<sup>2</sup>. It was notified on December 8, 1994. The sanctuary comprises hill slopes, with hill plateaus and valleys that include private Malki lands. The dry deciduous mixed and scrub forests, along with old forest plantations, support a rich population of peafowls as well as several species of mammals, birds, and herpetofauna. Percolation tanks in the neighboring villages also attract migratory water birds. With all encroachments removed, the PA features several water harvesting and soil conservation structures. It holds religious and aesthetic values and offers good visitor facilities and equipment. The area is well-visited and is supported by a few EDCs, an animal-rescue NGO, and local residents. An ESZ was notified in 2020.

Religious sites such as Madarshah Dargah and Hanuman Tekadi draw many pilgrims and tourists to the PA, while six villages and two hamlets exert heavy pressure from livestock grazing and wood extraction. The sanctuary also contends with the presence of private lands, highways with heavy traffic nearby, non-palatable grasses and weeds, water scarcity during the summer months, and the absence of RO quarters and an interpretation center.

**Recommendations** - Recommendations include preparing a new management plan, constructing boundary pillars and cattle-proof fences, regulating tourism to minimize impact, displaying signage based on specific needs, engaging with local communities to develop income generation programs, including eco-

tourism, establishing appropriate zonation of the PA, improving education, awareness, and bird watching programs, including the development of an interpretation center, establishing an entry gate at Naigaon, and enhancing staff training and ecological monitoring efforts.

## 26. Nandurmadhyameshwar WLS, Maharashtra (2023-24):

The century-old, man-made WLS covers an area of 100.12 Km<sup>2</sup> and is located at the confluence of the Godavari and Kadva rivers in Nashik district. It was notified as a WLS on February 25, 1986. Recognized as an IBA, the sanctuary represents tropical thorn forests and lies along the CAF, attracting approximately 30,000 birds annually, including around 240 species, such as the globally threatened Eastern Imperial Eagle. The wetland is rich in aquatic vegetation, featuring a diverse algal flora, and supports 20 species of fish, including the Fishing Cat. The PA has satisfactory infrastructure for bird watching, as well as nature education and interpretation facilities. The active involvement of EDCs in PA protection and tourism, along with the presence of 15 local youth acting as Pakshimitra, helps strengthen PA management through revenue sharing with the EDC.

However, there are 11 villages surrounding the PA, home to more than 27,000 livestock and several locally revered temples. The final notification of the PA and approval of the management plan are still pending. The area experiences stray incidents of illegal grazing and fishing, siltation and eutrophication of water bodies, algal blooms, the spread of Water Hyacinth and *Ipomoea*, inflow of pesticides-laden water from agricultural fields, insufficient funding, and porous boundaries.

**Recommendations** - Important recommendations include rationalization and consolidation of boundary and issuance of final notification, immediate management plan approval, regular monitoring of waterflows and water quality, development of roosting sites and planting of native trees over earth mounds, islands and bunds, improved ecological studies and monitoring, further strengthening of eco-development and interpretation programmes, removal of invasive species, development of a feed-back system, improved fund flow and better inter-sectoral coordination.

## 27. Painganga WLS, Maharashtra (2023-24):

Painganga WLS was notified in 1986. Spreading over 406 Km<sup>2</sup>, the PA is situated on the banks of the river Painganga in the Yawatmal district and is predominantly composed of tropical dry deciduous forests and savannah lands. It serves as an important corridor for transient tigers, linking with the Tipeshwar WLS to the northeast and Kawal TR to the southeast.

While the sanctuary has an approved management plan and adequate protection infrastructure, it faces significant challenges, including heavy grazing pressure from 13 villages outside its boundaries and significant HWC affecting local communities. Additionally, issues such as insufficient funds, inadequately trained staff, illegal mining of sand and river stones, and ineffective monitoring of transient tigers hinder effective conservation efforts.

**Recommendations** - The recommendations include preparation and implementation of the Zonal Master Plan for the ESZ, addition of adjacent forest areas to help transient tiger movement and its upgradation as a TR, effective monitoring of the transient tigers in the landscape, improved training programmes, improved ecological studies and monitoring of endangered species, revival of nature tourism, establishment of an interpretation centre, enhanced financing relocation of villages from the PA.

## 28. Radhanagari WLS, Maharashtra (2023-24):

The first WLS of Maharashtra since 1958, protected then by the Kolhapur dynasty, the 351.16 Km<sup>2</sup> area of the present PA was renotified on 16 September 1985. Located at the southern end of the Sahyadri hills, the area forms catchments of the Bhogavati and Doodh Ganga rivers, separated by Idarganj plateau. Hilly and undulating, the PA consists of dense tropical evergreen, semi-evergreen and moist deciduous forests with pockets of grasslands, and unique habitats, named Dangs and Sadas. One of the 18 critical wildlife habitats in the state, the PA has 42 species of mammal, 303 birds, 52 reptiles, 19 amphibians, 66 species of butterfly. The Gaur is the flagship species of the PA. Protected naturally by steep escarpments and cliffs on the west, the PA is surrounded by the territorial forests, and community conserved sacred forests.

Although excluded in the notification, there are 12 villages, 17 settlements and the town of Radhanagari within the perimeter of the PA. In addition, there are two reservoirs within the PA and the State Highway 116 passes through it. Open areas and grasslands are infested with non-palatable species like *Strobilanthes*

*callosa*, *Eupatorium odoratum* etc.

**Recommendations** - Major management recommendations include immediate preparation of the new management plan, expediting village relocation plan, strengthening of eco-development programme for community welfare, eco-tourism and PA protection, calibrating the Monitoring System for Tigers: Intensive Protection and Ecological Status (M-STrIPES) monitoring data for generating PA-specific ecological information, improvement of fodder and water availability, especially in the grasslands and plateau areas, improving protection infrastructure, field staff numbers and their training and protection gear, improved signage displays, and vaccination of local cattle.

## 29. Tipeshwar WLS, Maharashtra (2023-24):

Tipeshwar WLS, in Yawatmal district was notified in 1997. Extending over 148.63 Km<sup>2</sup>, this PA is part of a very large landscape in the Vidarbha region and is dominated by dry Teak-bearing forests. It is home to a variety of habitats suitable for many threatened species of plants and animals, acting as a stepping stone corridor for tigers, which constitutes part of the Tadoba metapopulation. The PA has an approved management plan, and the necessary protection infrastructure, along with the presence of breeding tigers, attracts high-end tourism in the sanctuary. Two villages have been relocated from the PA, assisting in its conservation efforts.

However, the PA faces challenges from 26 villages outside and one village inside that exert heavy grazing pressure. The adjacent villages experience significant HWC, which can threaten local livelihoods and conservation efforts. Being close to Nagpur, the PA draws a significant number of tourists, enhancing its profile as a wildlife destination. Despite this, it suffers from inadequate funds and ineffective monitoring of the transient tigers moving through the PA, which complicates overall management and conservation initiatives. Addressing these issues is essential for the long-term viability of the PA and the wildlife it harbors.

**Recommendations** - The recommendations include preparation and implementation of the Zonal Master Plan for the ESZ, addition of adjacent forest areas to help transient tiger movement and its upgradation as a TR, effective monitoring of the transient tigers in the landscape, filling up of the vacancies of staff and improved training programmes, systematic monitoring of areas of the relocated villages, improved grassland management, improved ecological studies

and monitoring of endangered species, establishment of an interpretation centre, and enhanced financing.

### 30. Tungareshwar WLS, Maharashtra, (2023-24):

The PA extends over 85.70 Km<sup>2</sup> in Palghar district and was notified on October 24, 2003. It is administered under the Sanjay Gandhi NP Division in Borivali. Located on a plateau, the PA features moist Teak-bearing and deciduous forests, as well as western sub-tropical and semi-evergreen forests. It is home to 600 plant species, 43 mammals, 250 birds, 150 butterflies, and 36 species of herpetofauna. The plateau is notable for the gregarious flowering of Karvi (*Strobilanthes callosa*) that occurs every 7th to 9th year. The leopard, which is the apex predator, is revered by local tribal communities as a divine deity known as Waghoba. The PA has 12 perennial springs and connects through tenuous corridors with Sanjay Gandhi NP and three other wildlife sanctuaries. It features an approved management plan, an adequate number of staff and equipment, timely availability of funds, and does not contain any villages within its boundaries, with a notified ESZ and high cultural and aesthetic values.

However, the PA is surrounded by 24 villages and a state highway and an express highway, which exert significant biotic pressure on the area. Popular sites such as the Tungareshwar Mahadev Temple, Parashuram Kund, caves, and the ruins of Kaman Fort attract large numbers of pilgrims, bird watchers, trekkers, and tourists. Additional management challenges include a porous PA boundary, inappropriate collection and disposal of solid waste in visitation areas, unresolved rights of non-tribal communities, inadequate implementation of eco-development programs, and limited education, awareness, and outreach activities.

**Recommendations** - Recommendations include strengthening the PA boundary, urgently settling FRA rights of local people, restoring the corridors that connect the landscape, regulating pilgrimages and tourism to prevent accidental deaths of wild animals, developing meadows and other habitats, activating and extending eco-development programs for improved livelihoods, enhancing protection and nature education, raising awareness, and increasing publicity efforts. Additionally, improving ecological research and monitoring, especially for vulnerable species such as vultures, Mouse Deer, and frogs, as well as implementing revenue recycling for effective PA management, should be prioritized.

### 31. Umred Karhandla WLS, Maharashtra (2023-24):

The Umred Karhandla WLS, notified in 2012 and renamed Umred Paoni Karhandla WLS in 2017, covers 189 Km<sup>2</sup> in the Bhandara and Nagpur districts. It serves as an ecological corridor linking to Tadoba Andhari and Nawegaon Nagzira TRs. The sanctuary supports many threatened species, is managed by well-equipped staff, and has an approved management plan, with the ESZ notified on 16 March 2017.

However, it faces challenges, including limited size affecting transient tiger numbers, inadequate and delayed funding, staff vacancies, biotic disturbances, increasing tourist traffic, and ineffective monitoring of tigers. Addressing these issues is critical for its conservation.

**Recommendations** - The recommendations include preparation and implementation of the Zonal Master Plan for the ESZ, addition of adjacent forest areas to help transient tiger movement and its upgradation as a TR, effective monitoring of the transient tigers in the landscape, filling up of the vacancies of staff and improved training programmes, systematic monitoring of areas of the relocated villages, improved grassland management, improved ecological studies and monitoring of endangered species, improving the publicity and outreach functions, and enhanced financing.

### 32. Yedshi Ramling Ghat WLS, Maharashtra (2023-24):

The PA in Osmanabad district encompasses a diverse ecosystem characterized by tropical dry deciduous stunted forests and thorny scrub, making it vital for local wildlife conservation. Its establishment on 17 May 1997 was primarily aimed at preserving habitats for various species, including leopards, wolves, hyenas, Sambar, Barking Deer, Blackbucks, and Chinkaras, in addition to numerous bird species and herpetofauna. The presence of old plantations of *Gliricidia* and *Prosopis*, along with water-logged areas populated by Shedy and Marvel Grass, contributes to the ecological diversity of the area.

The PA is well-protected with adequate staff and infrastructure, including a heritage railway guest house, which supports eco-tourism and offers a unique experience for visitors. However, despite its protective measures, the PA faces significant challenges due to nearby villages with over 4300 cattle, the influx of pilgrims to the Ramling temple, and the increasing

vehicular traffic from the state highway, all of which contribute to habitat disturbance.

Additional challenges include the expiration of the current management plan, an inactive eco-development program, a high incidence of invasive weeds and wildfires, accumulating solid waste around the temple complex, the non-functionality of the interpretation center, and a lack of adequate wildlife training for staff. Addressing these issues is crucial for the future sustainability of the PA, as it strives to balance conservation efforts with the needs of surrounding communities and visitors.

**Recommendations** - Recommendations include preparation of the new management plan with proper zonation, fixing boundary around Ramling temple, appropriate equipment and regular wildlife training to staff, installation of more camera traps and systematic monitoring of key species, putting the heritage railway guest house under PA control for eco-tourism and interpretation, improved availability of fodder and water to wildlife, strengthening eco-development for community development, pilgrimage management and PA protection, improved education-awareness programmes and appropriate display of signage, especially in and around the temple premise, renovation of abandoned buildings improved engagement with temple authority, and obtaining CSR funding.

### 33. Sagarshwar WLS, Maharashtra (2024-25):

The PA, situated in Sangli district, covers an area of 10.87 Km<sup>2</sup> and was notified as a WLS in 1985 through the collective efforts of local people, political leadership, and a respected freedom fighter. Thanks to effective protection measures and consistent habitat improvement initiatives, the once dry scrubland has transformed into a green oasis. The area is partially fenced and supports several introduced species, including Spotted Deer, Blackbuck, Sambar, and Barking Deer, along with reports of leopards and Gaurs. The PA has adequate infrastructure, funding, and staff, and an ESZ 100 meters wide was notified in 2017.

However, the PA is quite small and is surrounded by agricultural fields. It has a fragile connection with the Sangli Forest Division and suffers from fragmentation due to the presence of a road, a canal, and a few temples nearby. Approximately one-third of the PA is infested with weeds, and there are a few encroachments on the edges of the PA, along with seasonal pilgrimages, which increase biotic pressures.

**Recommendations** - Recommendations include preparing a zonal master plan for the ESZ, conducting genetic profiling of the introduced species, performing ecological restoration studies, preventing woodland encroachment in the grasslands, and improving the management of grasslands. Additionally, it is essential to continue scientific engagement with the Wildlife Conservation Trust and implement improved population estimation methods for better wildlife management.

### 34. Yawal WLS, Maharashtra (2024-25):

The PA spans 198.06 Km<sup>2</sup> and was notified on February 21, 1969. It is a crucial component of the tiger corridor connecting Melghat TR in the east to Aner dam WLS in the west. Predominantly inhabited by tribal communities, the PA serves as the catchment for three major rivers: The Aner, Suki, and Manjal. The reservoir of the Suki dam medium irrigation project and its surrounding areas have significant potential for eco-tourism. An ESZ was notified in 2019.

However, the PA contains four villages within its boundaries and about 20 villages in the vicinity, creating significant biotic pressure. The largely hilly and narrow terrain makes it difficult to effectively patrol the area due to inadequate staff numbers. Additionally, the PA boundaries are not completely demarcated, and the presence of inadequately trained staff along with the absence of an interpretation center further undermine management efforts.

**Recommendations** - Recommendations include revising the management plan as a unit of the Satpura Landscape in accordance with Government of India guidelines; preparing a zonal master plan for the ESZ; urgently settling tribal rights under the FRA; improving the number, skills, and knowledge of staff while instituting appropriate wildlife training; developing the Suki dam reservoir area into a community-linked eco-tourism site; examining the rationalization of boundaries to include important forest areas from neighboring divisions; and enhancing ecological monitoring, interpretation, and awareness programs.

### 35. Isapur WLS, Maharashtra (2024-25):

The PA extends over 3,789.69 hectares and was constituted in 1995 by amalgamating areas from the Pusad and Hingoli Forest Divisions, along with 637.34 hectares from the irrigation department to grant environmental clearance for the Upper penganga project. The PA is administered under the Pusad Forest Division and has an approved management plan.

However, despite being established for more than two decades, the management has not yet aligned itself with effective wildlife management practices, and dedicated staff have not been deployed. Additionally, there are no patrolling camps or associated

infrastructure within the WLS.

**Recommendations** - Recommendations include constituting a unified dedicated administration for PA management, revising the management plan to align with Government of India guidelines, and providing

*Trend of MEE scores between first and repeat cycles*

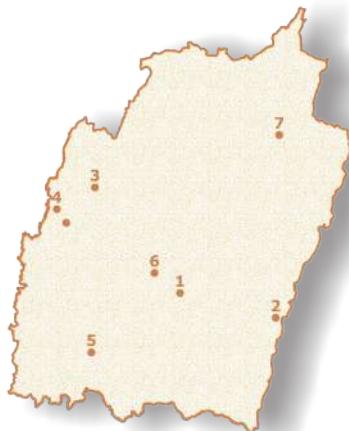
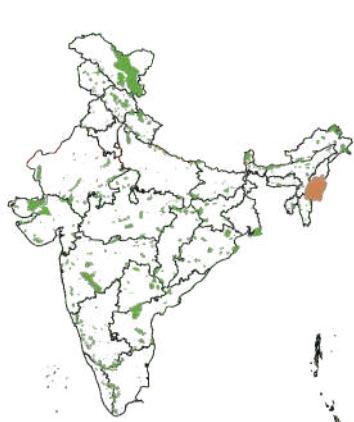
Sl. No	PAs	First Cycle			Repeat Cycle			Trend
		Phase	MEE Score (%)	Category	Evaluation Year	MEE Score (%)	Category	
1	Sanjay Gandhi (Borivilli) NP	2006-2009	62.1	Good	2018-2019	75.8	Very Good	▲
2	Bhimashankar WLS	2006-2009	58.3	Fair	2020-2022	73.44	Good	▲
3	Chaprala WLS	2009-2010	54.69	Fair	2020-2022	63.28	Good	▲
4	Dhyanganga WLS	2015-2017	74.17	Good	2020-2022	71.88	Good	▼
5	Ghodazari WLS	-	-	-	2020-2022	45.97	Fair	-
6	Great Indian Bustard WLS	2012-2013	47.5	Fair	2020-2022	67.97	Good	▲
7	Karnala Bird WLS	2012-2013	63.33	Good	2020-2022	74.22	Good	▲
8	New Maldhok Bird (Gangewadi) WLS	-	-	-	2020-2022	55.65	Fair	-
9	Phansad WLS	2015-2017	70.83	Good	2020-2022	68.75	Good	▼
10	Pranhita WLS	-	-	-	2020-2022	50	Fair	-
11	Sudhagad WLS	-	-	-	2020-2022	38.28	Poor	-
12	Tamhini WLS	-	-	-	2020-2022	60.16	Good	-
13	Tansa WLS	2015-2017	58.33	Fair	2020-2022	57.81	Fair	▼
14	Aner Dam WLS	2017-2018	49.14	Fair	2022-2023	55.47	Fair	▲
15	Bhamragarh WLS	2017-2018	39	Poor	2022-2023	41.41	Fair	▲
16	Deulgaon-Rehekuri WLS	2017-2018	72.5	Good	2022-2023	69.53	Good	▼
17	Gautala-Autramghat WLS	2017-2018	76.67	Very Good	2022-2023	72.66	Good	▼
18	Jaikwadi Bird WLS	2017-2018	66.38	Good	2022-2023	60.16	Good	▼
19	Kalsubai Harishchandragad WLS	2017-2018	59.17	Fair	2022-2023	73.44	Good	▲
20	Kanhargao WLS	-	-	-	2022-2023	53.91	Fair	-
21	Karanja Sohal (Blackbuck) WLS	2017-2018	69.17	Good	2022-2023	73.44	Good	▲
22	Katepurna WLS	2017-2018	73.33	Good	2022-2023	74.22	Good	▲
23	Lonar WLS	2017-2018	67.24	Good	2022-2023	88.28	Very Good	▲
24	Mayureswar Supe WLS	2018-2019	75	Very Good	2023-2024	64.06	Good	▼
25	Naigaon Peacock WLS	2018-2019	66.4	Good	2023-2024	58.59	Fair	▼
26	Nandurmadhyameshwar WLS	2018-2019	64.6	Good	2023-2024	61.72	Good	▼
27	Painganga WLS	2018-2019	62.06	Good	2023-2024	70.31	Good	▲
28	Radhanagri WLS	2015-2017	72.5	Good	2023-2024	60.94	Good	▼
29	Tipeshwar WLS	2018-2019	70.8	Good	2023-2024	78.13	Very Good	▲
30	Tungareshwar WLS	2018-2019	64	Good	2023-2024	64.06	Good	▲
31	Umred-Karhandla WLS	-	-	-	2023-2024	89.84	Very Good	-

32	Yedshi Ramling Ghat WLS	2018-2019	72.41	Good	2023-2024	57.03	Fair	▼
33	Sagareshwar WLS	2018-2019	71.5	Good	2024-2025	75.78	Very Good	▲
34	Yawal WLS	2018-2019	65.8	Good	2024-2025	71.88	Good	▲
35	Isapur WLS	-	-	-	2024-2025	Not under - the unified control of FD	-	-
36	Chandoli NP	2009-2010	60.16	Good	-	TR	-	-
37	Malvan Marine WLS	2017-2018	28.7	Poor	-	CMPA	-	-
38	Navegaon NP	2006-2009	53.8	Fair	-	TR	-	-
39	Thane Creek Flamingo WLS	2018-2019	75.92	Very Good	-	CMPA	-	-

# Manipur

Keibul Lamjao © Rupali Thakur





## Manipur

Manipur located in north-eastern India, spans a geographical area of approximately 22,327 Km<sup>2</sup>. The state's forest cover is 16,585.46 Km<sup>2</sup>, accounting for 74.29% of its geographic area (ISFR 2023). In the first cycle of MEE, 3 PAs were assessed. In the repeat cycle, 8 PAs were evaluated, including 5 newly added PAs. 1 PA was omitted from the assessment as its boundary was not properly demarcated.

### 1. Keibul-Lamjao NP, Manipur (2018-19):

Keibul-Lamjao NP, located in Manipur, was notified in 1977 and spans an area of 40 Km<sup>2</sup>. Being part of Loktak lake, a Ramsar site, the PA is well integrated into a broader ecological network and is home to the only population of Sangai (Dancing Deer) in the country, alongside many threatened species. The unique Phumdi habitat is protected within well-defined management zones. Local communities support the PA, aided by an active eco-development program focused on women's SHGs, and the annual Sangai festival promotes conservation awareness.

However, the PA faces challenges, including inadequately trained staff particularly regarding the ecology of freshwater ecosystems, absence of an approved management plan, lack of interpretation facilities, and no functional complaint handling system.

**Recommendations** - Recommendations involve training front-line and mid-level staff, conducting frequent population estimates of the Sangai and associated wildlife, establishing a second population of Sangai, conducting participatory threat analyses, urgently preparing the management plan, improving

fire protection and weed management, ensuring timely and adequate fund releases, and establishing a complaint handling system.

### 2. Yangoupokpi Lokchao WLS, Manipur (2020-22):

The PA, covering 184.80 Km<sup>2</sup>, was notified in 1986 to safeguard the biodiversity of this significant region, which lies within the Indo-Malayan biogeographic zone. Situated along the border of Myanmar, the east Himalayan tropical and sub-tropical semi-evergreen and pine forests extend into Myanmar, creating a vast ecological landscape and securing high biodiversity and water catchment values. The unique Indo-Burmese zoological affinity enriches the area with a distinctive assemblage of wild animals. National Highway 102 runs through the PA, which is also home to about 20 indigenous tribes. The presence of the Assam Rifles in part of the PA aids in management and protection activities, with trained officers and staff overseeing wildlife management.

However, the DFO is responsible for multiple PAs, which hampers dedicated supervision of this particular area. Weaknesses in management include social unrest

due to intra-tribal conflicts and law and order issues, spillover effects of insurgency, inadequate staffing and protection infrastructure, lack of participatory programs with local communities, severe poverty and unemployment, and the absence of ecotourism, nature education, and research-monitoring initiatives.

**Recommendations** - Recommendations include appointing a full-time wildlife warden and adequate staff, improving staff capabilities and protection infrastructure, establishing EDCs within local communities to initiate eco-development programs for protection and livelihood enhancement, collaborating with scientific institutions to build a comprehensive database on the PA, and instituting awareness programs among police, revenue, paramilitary, and military organizations about the issues related to wildlife trade, smuggling, and the loss of critical wildlife resources through international networks.

### 3. Bunning WLS, Manipur (2022-23):

The PA, covering 115.8 Km<sup>2</sup> and located in the Barail Hills, was notified in 1997. It consists predominantly of evergreen and montane forests, along with alpine grasslands, and is situated near the Barak river, which forms the catchment for many streams. The PA links with the westernmost PA of Manipur, Jiri Makru, through a forested landscape. It is rich in biodiversity characteristic of the northeastern Himalayas, and the local community is generally supportive of management efforts, with some community-linked projects already implemented nearby.

However, the final notification of the PA is still awaited. The PA suffers from a lack of frontline staff, management plan, baseline information, and connections with local institutions. Weak inter-sectoral linkages and the continuation of customary hunting by local tribals further complicate management challenges.

**Recommendations** - Recommendations include urgently appointing supervisory and frontline staff, preparing a comprehensive management plan, involving local establishments like the ZSI and BSI to create baseline information on key flora and fauna, actively engaging with local communities to develop income-generating eco-development programs such as eco-tourism, providing employment opportunities for local youth in PA management, and intervening in alpine grasslands only under expert supervision.

### 4. Jiri Makru WLS, Manipur (2022-23):

The PA, located between the Jiri and Makru rivers—tributaries of the Barak river at the Assam-Manipur border—covers 198 Km<sup>2</sup> and was notified in 1997. It is part of the West Manipur Hills and features undulating terrain with tropical semi-evergreen to sub-tropical wet hill forests. The PA connects to Assam in the west and Bunning WLS in the east, and it contains some of the last remaining primary forests. The area serves as an important migratory route for elephants, and local tribes report the presence of tigers.

However, the PA is remote, with poor access and minimal staffing (only one RO). It suffers from severe shortages of human and financial resources. Local communities have contested the establishment of the PA and have raised objections to its final notification. Challenges such as inadequate protection infrastructure, the absence of a management plan, lack of a landscape-level vision, insufficient stakeholder participation, and weak inter-sectoral coordination further complicate management efforts.

**Recommendations** - Recommendations include actively engaging with local communities to address their objections, assessing the status and migratory patterns of tigers and elephants, posting adequate staff and improving protection infrastructure, collaborating with local NGOs for awareness generation and conflict mitigation, establishing an inter-state coordination mechanism to manage elephant conflict issues, employing local youth in PA management activities, and fostering constructive dialogue with local communities for the long-term conservation of the area.

### 5. Kailam WLS, Manipur (2022-23):

The PA, covering 187.5 Km<sup>2</sup> in the hilly region of Manipur, was notified in 1997. It primarily consists of sub-tropical wet hill forests and is the second largest PA in Manipur, home to five species of Hornbills as well as several endangered and threatened plant and animal species. Bounded by National Highway 102 B and three rivers, the PA acts like a forested island with high biodiversity values, though it is connected to surrounding forests. An ESZ has been notified around the PA.

The management of the PA is centralized at the state headquarters, with only one RO in place and no frontline staff or protection infrastructure. There is no management plan established for the PA. Local communities continue to resist the PA's establishment,



leading to ongoing conflict as they assert traditional rights to PA resources, which previously belonged to them before notification. There has been no collaboration with local NGOs or other institutions.

**Recommendations** - Recommendations include involving local political leaders, NGOs, and other stakeholders to resolve land ownership conflicts and introduce participatory wildlife management. Training local youth in Hornbill watching, tree identification, and hospitality can help develop community-centric eco-tourism, enhancing livelihoods while supporting PA conservation. Introducing nature education programs in nearby schools, promoting the PA as a Hornbill habitat to attract tourists, and collaborating with local NGOs to highlight the benefits of participatory management are essential steps for successful conservation efforts.

## 6. Khongjaingamba Ching WLS, Manipur (2022-23):

The PA, covering just 0.412 Km<sup>2</sup>, was notified in 2016. Located on a small hillock near the renowned Keibul Lamjao NP, it has helped prevent encroachments in the area. Composed of evergreen forests, the PA is home to some wildlife and is part of the Bishnupur Division. Recent community-based habitat restoration efforts indicate a growing acceptance of the PA among local residents.

Despite its small size, which limits its significant ecological value, the PA's importance lies in its proximity to Keibul Lamjao NP.

**Recommendations** - Recommendations include integrating this small PA into Keibul Lamjao NP under a single administration to enhance conservation benefits.

## 7. Shirui NP, Manipur (2022-23):

Situated near the India-Myanmar border in East Imphal district, this high mountainous area covering 100 Km<sup>2</sup>



was notified in 1982. It is the only known habitat for the endemic Shirui Lily (*Lilium mackliniae*), the state flower, and is also home to the state bird, Lady Hume's Pheasant. The PA represents East Himalayan wet temperate forests and boasts a rich diversity of Rhododendrons and Oaks, along with several endangered and threatened animal species. An annual Shirui Lily festival is held in May-June, attracting numerous tourists and adding to the state's tourism circuit.

The forests were historically owned by local communities prior to the PA's notification. Due to strong objections from local people concerned about the potential loss of their traditional rights, including hunting, the final notification has not been issued. The PA faces challenges, including the absence of a dedicated wildlife establishment and protection infrastructure, a lack of a management plan, insufficient dialogue with local communities, and

uncontrolled tourism during the lily festival, which impacts the habitat. Additionally, ex-situ propagation of the lily has not been successful.

**Recommendations** - Recommendations include finalizing the management plan, engaging local political leaders, NGOs, and stakeholders to resolve land ownership conflicts and introduce participatory wildlife management. Training local youth to develop community-centric eco-tourism can improve their livelihoods while supporting PA conservation. Local communities should be involved in regulating tourism during the annual lily festival, and documenting local conservation methods would be beneficial. Collaborating with local NGOs and institutions to generate baseline biodiversity information and promote the benefits of participatory management is also crucial.

### 8. Zeiland WLS, Manipur (2022-23):

The compact PA of 21 Km<sup>2</sup>, featuring semi-evergreen and wet hill forests, was notified in 1997. Located near the town of Tamenglong and bordered by the Barak river to the east, the PA includes Barak lake, a major tourist attraction, as well as several smaller lakes that attract wintering birds, including Amur Falcons during the winter months. While local residents are generally supportive of the management, they seek financial benefits from the PA. Some management activities, such as weed removal, have been attempted with community participation, and a draft management plan has been prepared and is awaiting approval.

The PA currently faces challenges, including a lack of field staff, weak participatory management efforts, insufficient involvement of NGOs and local institutions in management activities, and poor cross-sectoral coordination.

**Recommendations** - Recommendations include appointing frontline staff as soon as possible, developing livelihood-support eco-development programs in collaboration with local communities, training local youth to build community-linked eco-tourism that benefits both the PA and the people, promoting the conservation of Amur Falcons for broader publicity, and improving cross-sectoral coordination among various governmental and non-governmental organizations.

### 9. Thinungei Bird WLS, Manipur:

The PA, extending to 103 hectares, was initially notified in 2019 with the support of local communities who owned land and fish ponds in the area. However,



discontent grew among the locals regarding the establishment of the PA due to fears of restrictions on their traditional resource use rights. Tensions escalated into violence when officials attempted to demarcate the PA boundaries, leading to a situation where the PA

is currently inaccessible to forest officials, and the MEE team could not visit the site.

The MEE team has recommended that an evaluation of the PA be conducted once the situation normalizes.

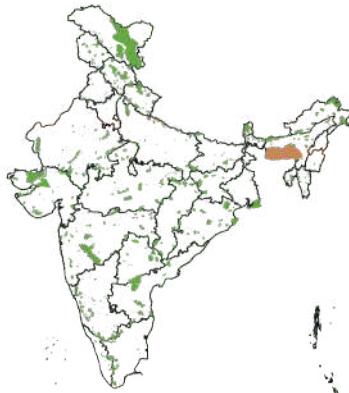
*Trend of MEE scores between first and repeat cycles*

Sl. No	PAs	First Cycle			Repeat Cycle			Trend
		Phase	MEE Score (%)	Category	Evaluation Year	MEE Score (%)	Category	
1	Keibul-Lamjao NP	2006-2009	73.5	Good	2018-2019	73.33	Good	▼
2	Yangoupokpi Lokchao WLS	2015-2017	50.89	Fair	2020-2022	64.84	Good	▲
3	Bunning WLS	-	-	-	2022-2023	39.03	Poor	-
4	Jiri Makru WLS	-	-	-	2022-2023	35.16	Poor	-
5	Kailam WLS	-	-	-	2022-2023	32.81	Poor	-
6	Khongjaingamba Ching WLS	2017-2018	27.08	Poor	2022-2023	42.74	Fair	▲
7	Shirui NP	-	-	-	2022-2023	44.53	Fair	-
8	Zeiland WLS	-	-	-	2022-2023	46.09	Fair	-
9	Thinungei Bird WLS	-	-	-	-	Boundary is not demarcated	-	-

*Meghalaya*



Bent toed Gecko © Vivek Sarkar



# Meghalaya



Meghalaya located in north-eastern India, spanning over a geographical area of approximately 22,429 Km<sup>2</sup>. The state's forest cover is 16,966.84 Km<sup>2</sup>, accounting for 75.65% of its geographic area (ISFR 2023). In the first cycle of MEE, 5 PAs were assessed. In the repeat cycle, 6 PAs were evaluated, including 1 newly added PA.

## 1. Nongkhylliem WLS, Meghalaya (2018-19):

Nongkhylliem WLS was notified in 2010 and covers an area of 29.54 Km<sup>2</sup>. As the PA has been carved out from existing RFs, it is fully integrated into a wider ecological landscape, and there is a proposal to extend its current area. The sanctuary has an approved management plan with proper zonation, and the ESZ has been notified. The PA experiences low biotic interference and includes several livelihood improvement programs to garner support from local communities, with systematic evaluation and routine reporting of management-related trends in place.

However, some management weaknesses include the absence of a coordinated system for conducting wildlife censuses, limited staff trained in wildlife management, and a lack of coordinated research.

**Recommendations** - Recommendations include training staff in wildlife management, standardizing methodologies and periodicity for key wildlife species assessments, and improving coordination with research institutions.

## 2. Balphakram NP, Meghalaya (2020-22):

The PA, covering an area of 335 Km<sup>2</sup>, was acquired over several years starting from 1986 from local tribal clans, with approximately 132 Km<sup>2</sup> yet to be formally notified. Known as "the land of spirits," the PA is situated in the South Garo Hills and features significant landscape changes over the years. The last MEE took place about a decade ago, and many Recommendations from that evaluation remain unimplemented. With an altitudinal gradient ranging from flood plains near Bangladesh to over 4,500 feet above sea level, the PA supports diverse habitats for a variety of wildlife, including a globally significant population of insectivorous plants, along with many endemic species. It is recognized as a migratory route for elephants, and its relative inaccessibility has helped preserve local biodiversity and catchment values.

However, the remoteness of the area poses challenges for PA protection, management, and the implementation of various programs. Additional issues include insufficient staff numbers, inadequate capacity and protection infrastructure, heavy northeast monsoon rains, and low-intensity insurgency, all of which adversely affect management efforts.

**Recommendations** - Recommendations include

enhancing eco-tourism programs and facilities, establishing an interpretation center, and implementing nature education programs. It is crucial to improve the connectivity of the PA with the outside world, constitute EDCs to boost eco-development activities, and involve local NGOs in creating participatory livelihood improvement and nature education programs. Increasing staff numbers, enhancing their capacities and facilities, ensuring timely fund flow, and promoting research and monitoring are also vital for effective management of the PA.

### 3. Narpuh WLS, Meghalaya (2020-22):

The PA, covering 49.90 Km<sup>2</sup>, was carved out of the Narpuh RF and is recognized as the only multi-storeyed, tall eastern tropical forest in the East Jaintia Hills. It was notified in 2014 to protect indigenous flora and fauna. The diverse habitats and wildlife are attributed to significant altitudinal variations, ranging from about 150 feet to 5,000 feet above sea level. However, the management plan has expired in 2022, and there are no villages within the PA. Local unemployed youth have formed voluntary protection squads to aid in its conservation.

The PA faces several challenges, including inadequate staff numbers, poor skills and knowledge in wildlife management (particularly regarding participatory approaches), insufficient protection infrastructure, and a lack of effective eco-tourism, eco-development programs, nature education, and research-monitoring initiatives.

**Recommendations** - Recommendations include improving protection infrastructure and increasing staff numbers, skills, and deployment. It is essential to prepare a new management plan immediately and enhance the planning and implementation of participatory programs with local communities for both PA protection and livelihood improvement. Institutionalizing the engagement and deployment of voluntary protection squads will bolster effective protection efforts. Additionally, developing eco-tourism and nature education programs, as well as collaborating with scientific institutions to establish a biodiversity database and promote ongoing research and monitoring of important habitats and species, are crucial for effective management.

### 4. Nokrek Ridge NP, Meghalaya (2020-22):

The PA, extending to 47.48 Km<sup>2</sup>, was notified in 1986 in the Nokrek ranges to protect the birthplace of *Citrus*

*indica* and its germplasm. Known for its rich biodiversity, the PA contains no villages and enjoys support from the surrounding local communities.

However, the PA faces significant challenges, including inadequate protection infrastructure, staff shortages, an inability to manage HWCs effectively, and insufficient participatory programs, nature education, and research monitoring.

**Recommendations** - Recommendations include preparing a management plan immediately, improving staff numbers, skills, and the protection network, instituting participatory programs with local communities—particularly in eco-tourism that utilizes local myths and stories—and enhancing publicity and interpretation efforts to promote the significance of the place that gave *Citrus indica* to the world.

### 5. Siju WLS, Meghalaya (2020-22):

The oldest and first PA in Meghalaya, covering just 5.19 Km<sup>2</sup>, was notified in 1989 in the southern Garo Hills for the protection of its catchment and biodiversity values. As part of the Balpakram-Baghmara and Siju-Rewak elephant corridor, the PA is a crucial component of a larger conservation landscape. The Simsang river, the longest river in Meghalaya, runs along its western border. The area is well known for bird watching and is home to five species of arboreal primates. There are no human settlements inside the PA, and it has potential for developing eco-tourism programs.

However, the PA suffers from several challenges, including staff shortages and inadequate training, poor infrastructure, and a lack of participatory programs. Additionally, it faces threats from insurgent activities, an absence of nature education and interpretation programs, inadequate institutional eco-tourism initiatives, and a lack of scientific information on various attributes of the PA.

**Recommendations** - Recommendations include improving the protection network by increasing the numbers, capacities, and deployment of frontline staff, preparing a comprehensive management plan, coordinating with local scientific institutions for the documentation and cataloguing of biodiversity, ensuring better fund flow, and developing participatory eco-tourism and nature education programs.

### 6. Baghmara Pitcher Plant WLS, Meghalaya (2022-23):

The PA for the in-situ conservation of the pitcher plant


*Roridomyces phyllostachydis* © Vivek Sarkar

(*Nepenthes khasiana*) covers 2.70 hectares and was notified in 1984. Located within the Baghmara Town Municipal limits, near Baghmara NP and Siju WLS, the PA is a well-protected RF administered under Baghmara NP. It attracts students, researchers, and nature enthusiasts, and an ESZ proposal has been prepared.

However, the PA is an isolated patch located on a steep slope, making it difficult for visitors to access. It is vulnerable to landslides, erosion, and fires, with marginal grazing also taking place. The ecological status of the pitcher plant population and its habitat hasn't been thoroughly studied, and a reported 40% decline in the species has occurred over the last 30 years. Local awareness of the plant is minimal, and other areas with significant pitcher plant populations

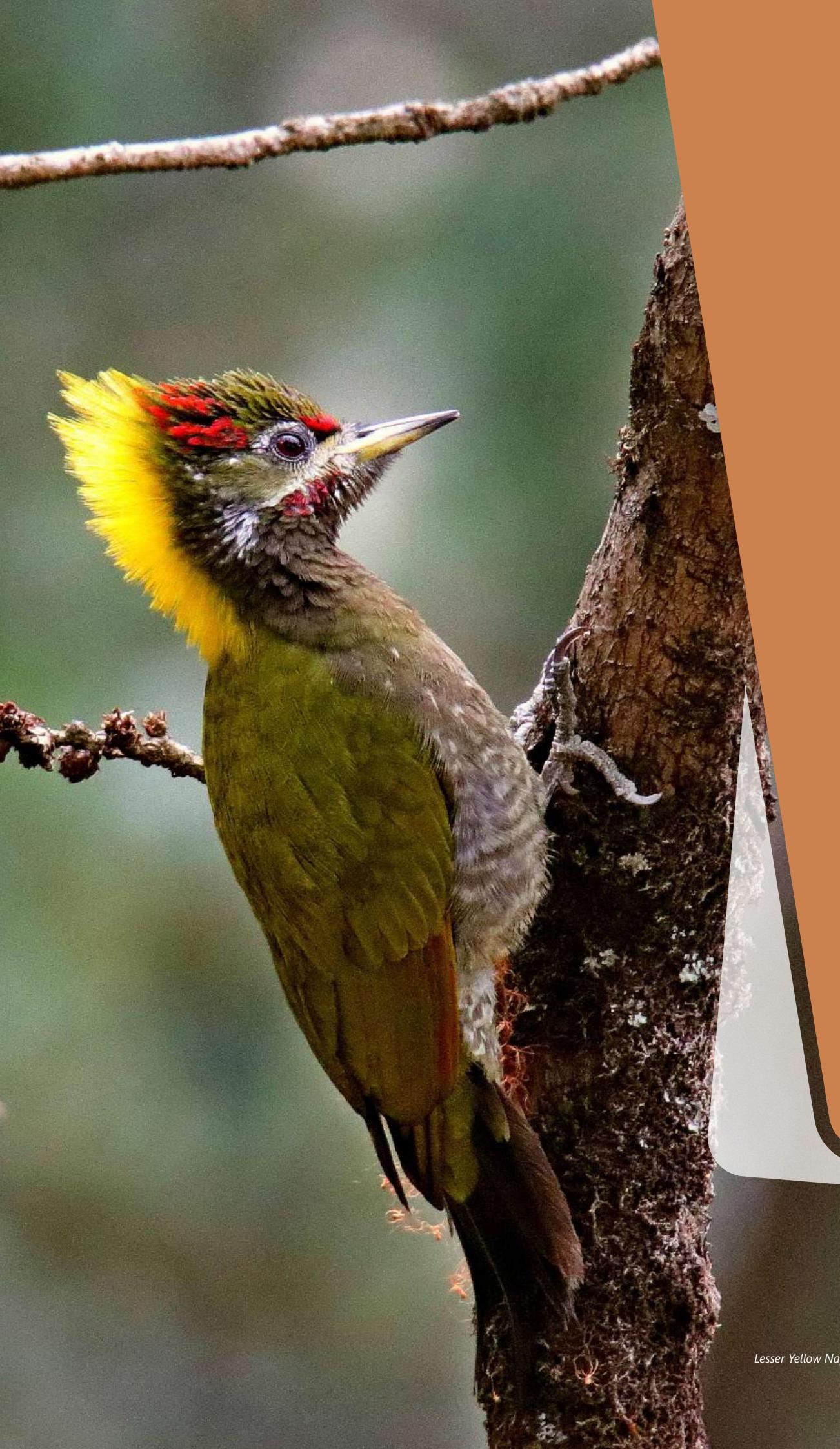
remain unidentified. Additionally, pollution from plastic and glass waste poses a threat to the PA.

**Recommendations** - Recommendations include incorporating an identified 8-hectare area in Baghmara RF into the PA network to enhance protection for the pitcher plant, improving visitor amenities, and raising awareness about the PA and the plant to attract more visitors. Developing a participatory eco-tourism program with local residents can aid in livelihood improvement and PA conservation. Engaging scientific and educational institutions for ecological research and monitoring, adequately training staff, initiating ex-situ conservation of the plant, maintaining a garbage-free area, and conducting periodic nature education programs for students and stakeholders are also crucial for effective conservation efforts.

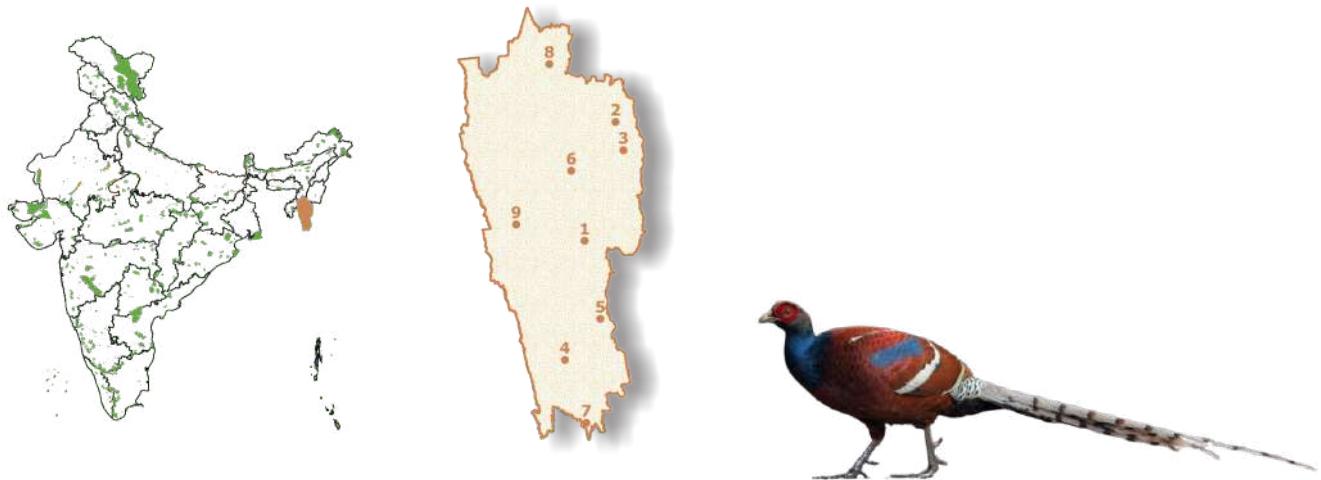
*Trend of MEE scores between first and repeat cycles*

Sl. No	PAs	First Cycle			Repeat Cycle			Trend
		Phase	MEE Score (%)	Category	Evaluation Year	MEE Score (%)	Category	
1	Nongkhyllam WLS	2006-2009	72	Good	2018-2019	79.17	Very Good	▲
2	Balphakram NP	2009-2010	58.59	Fair	2020-2022	64.06	Good	▲
3	Narpuh WLS	-	-	-	2020-2022	64.84	Good	-
4	Nokrek Ridge NP	2012-2013	60	Good	2020-2022	54.69	Fair	▼
5	Siju WLS	2015-2017	50	Fair	2020-2022	63.28	Good	▲
6	Baghmara Pitcher Plant WLS	2017-2018	53.45	Fair	2022-2023	69.17	Good	▲

Mizoram



Lesser Yellow Nape © Vivek Sarkar



## Mizoram

Mizoram is located in north-eastern India, spanning over a geographical area of approximately 21,081 Km<sup>2</sup>. The state's forest cover is 17,990.46 Km<sup>2</sup>, accounting for 85.34% of its geographic area (ISFR 2023). In the first and repeat cycle of MEE, 9 PAs were assessed. In both the MEE exercises one PA was not included as the final notification was not issued.

### 1. Khawnglung WLS, Mizoram (2022-23):

The PA, initially notified over an area of 41 Km<sup>2</sup> in 1991 and subsequently rationalized to 35 Km<sup>2</sup> with final notification issued in 2001, was carved out of the Thenzawl Forest Division. The PA is accessible via a fair-weather road connected to NH 54 leading to Aizawl. Its hilly terrain, featuring tropical evergreen and semi-evergreen forests, supports several species of plants and animals of conservation significance. The Mizo tribe inhabits the area, and PA management has implemented women-centric eco-development programs. A management plan is in place, and the PA is well protected, with connections to neighboring forests that enhance its landscape value.

However, challenges persist, including insufficient human and financial resources, a lack of data on population trends of critical wildlife species, absence of climate change monitoring, ongoing customary hunting of wild animals, and unregulated tourism.

**Recommendations** - Recommendations include conducting a DGPS survey to consolidate the PA boundary, improving staff numbers and training, increasing financial allocations with timely fund

releases, undertaking long-term collaborative ecological research and monitoring, developing an interpretation center, and implementing nature education programs. Engaging local communities in participatory eco-tourism can generate income for local residents and aid PA protection. Additionally, efforts should be made to include the Lumpi hillock, which serves as a catchment for various streams, within the PA.

### 2. Lengteng WLS, Mizoram (2022-23):

The Lengteng WLS, located in the Lengteng Hills near the Indo-Myanmar border, was notified in 2002 and encompasses an area of 60 Km<sup>2</sup>, previously designated as community forests. The hilly terrain features large tracts of relatively undisturbed sub-tropical evergreen, semi-evergreen, and montane forests. Historically a significant hunting area for local tribes, the PA still supports substantial wildlife populations and is recognized as an IBA, hosting several endemic and threatened species. The sanctuary has an approved management plan and holds landscape value, being connected to the Chin Hills of Mizoram.

However, the PA faces challenges due to the presence

of seven surrounding villages, with one village, Selam, exhibiting hostility towards PA management. Additionally, it suffers from a shortage of human and financial resources, ongoing customary hunting, poaching, forest fires, HWCs, habitat degradation, and a lack of ecological research, monitoring, and eco-tourism initiatives.

**Recommendations** - Recommendations include conducting a DGPS survey to consolidate the PA boundary, improving staff numbers and training, increasing financial allocations with timely fund releases, conducting long-term collaborative ecological research and monitoring, implementing nature education programs, and engaging local communities in participatory eco-tourism to generate income for the residents and support PA protection efforts.

### 3. Murlen NP, Mizoram (2022-23):

Located in the southern part of the Naga-Mizoram Mountain near the Indo-Myanmar border, an area of 50 Km<sup>2</sup> was initially notified as a WLS in 1989, upgraded to a NP in 1991, and received final notification as a NP for an area of 100 Km<sup>2</sup> in 2003. The PA is dominated by sub-tropical wet evergreen and semi-evergreen hill forests, as well as pine forests, and is identified as an IBA with several endemic and threatened bird species. It holds significant hydrological and cultural value and is home to the state bird, Lady Hume's Pheasant. An interpretation center and a management plan are in place.

However, there are seven villages surrounding the PA that exert biotic pressures on its ecosystems. Other management challenges include a shortage of human and financial resources, customary hunting by tribal communities, poaching, forest fires, HWCs, habitat degradation, and a lack of ecological research, monitoring, and adequate nature education and eco-tourism programs.

**Recommendations** - Recommendations include conducting a DGPS survey to consolidate the PA boundary, improving staff numbers and training, increasing financial allocations with timely fund releases, conducting long-term collaborative ecological research and monitoring, implementing nature education programs, and engaging local communities in participatory eco-tourism to generate income for local residents and support PA protection efforts.

### 4. Ngengpui WLS, Mizoram (2022-23):

Located near the Indo-Myanmar and Indo-Bangladesh

borders, this PA, covering 110 Km<sup>2</sup>, is renowned as one of the finest rainforests in the region and is referred to as the "great forests of sambars." Notified in 1997 and administered by the Chhimtuipui Wildlife Division, the PA is home to elephants, Gaurs, eight species of primates, six species of ungulates, several felids, and aquatic fauna, including the Malayan Sun Bear. It is designated as an IBA with many endemic and threatened bird species and possesses significant hydrological, cultural, and landscape values, also serving as an important ethnobotanical site. Local NGOs assist with PA management by addressing PA-people conflicts and promoting women-centric income-generating activities.

Despite its ecological significance, the PA faces several challenges. There are ten villages located around the PA, with some villagers continuing to enter the area for NTFP collection and customary hunting. Additional management issues include shortages of human and financial resources, poor protection infrastructure, poaching, forest fires, human-animal conflicts, habitat degradation, and a lack of ecological research and monitoring, as well as inadequate nature education and eco-tourism programs. Notably, some departmental gun licenses have expired and require renewal.

**Recommendations** - Recommendations include conducting a DGPS survey to consolidate the PA boundary; improving staff numbers and training; increasing financial allocations and ensuring timely fund releases; conducting long-term collaborative ecological research and monitoring; developing an interpretation center and implementing nature education programs; engaging local communities in participatory eco-tourism to generate income for residents and support PA protection; renewing departmental gun licenses; mitigating human-elephant conflict; and integrating wildlife management into the working plans of adjacent forest divisions.

### 5. Phawngpui Blue Mountain NP, Mizoram (2022-23):

Also known as Blue Mountain NP, this PA encompasses 50 Km<sup>2</sup> and was notified in 1997. Its local name translates to "a place of Bamboo grass," reflecting the widespread presence of Bamboo grass (*Eulalia trispicata*). The PA shares a boundary with Myanmar and contains the highest peak in Mizoram, rising to 2,157 meters above sea level. It holds significant ecological, hydrological, and historical-cultural value. Comprising tropical evergreen and montane wet



forests, along with Bamboo brakes, the PA is home to mega-herbivores such as elephants and gaurs, as well as bears (including the Malayan Sun Bear), several species of primates, felids, ungulates, and a variety of lower-order fauna. As an IBA, it hosts many globally threatened and restricted-range bird species, attracting a limited number of bird watchers. The PA is also recognized as an important ethnobotanical site, with various plants used by local tribal communities, and has a management plan in place.

However, the PA is surrounded by 11 culturally associated villages on the Indian side, which exert biotic pressures on its ecosystems. The PA faces several challenges, including shortages of human and financial resources, poor protection infrastructure, customary hunting, poaching, forest fires, human-animal conflicts, habitat degradation, a lack of ecological research and monitoring, and inadequate nature education and eco-tourism programs.

**Recommendations** - Recommendations include improving staff numbers and training, enhancing protection infrastructure, increasing financial allocations with timely fund releases, conducting long-term collaborative ecological research and monitoring, developing an interpretation center and implementing nature education programs, engaging local communities in participatory eco-tourism to generate income for residents and aid PA protection, and adopting trans-boundary conservation strategies with the Myanmar FD through landscape-based planning.

#### **6. Tawi WLS, Mizoram (2022-23):**

The PA, located in the southeastern part of Aizawl district near the Myanmar border, received its final notification in 2001 and spans an area of 35.75 Km<sup>2</sup>. This landscape is surrounded largely by community forests and is part of the Indo-Burma Global Biodiversity Hotspot. It features tropical evergreen, semi-evergreen, and sub-tropical hill forests, along



*Elephant © Rupali Thakur*

with extensive bamboo brakes, which are rich in plant diversity and host many RET species, as noted in the management plan. The PA also supports several conservation-significant animal species and holds high hydrological and cultural values.

Surrounding the PA are seven villages, and its proximity to the international border makes it susceptible to illegal poaching and tribal hunting. The PA faces several challenges, including inadequate human and financial resources, poor protection infrastructure, forest fires, human-animal conflicts, habitat degradation, unregulated tourism, and a lack of ecological research, monitoring, and sufficient nature education and eco-tourism programs.

**Recommendations** - Recommendations include improving staff numbers and training, enhancing protection infrastructure, conducting a DGPS survey to consolidate the PA boundary, increasing financial allocations with timely fund releases, undertaking

long-term collaborative ecological research and monitoring, developing an interpretation center, and implementing nature education programs. Engaging local communities in participatory eco-tourism can generate income for residents and support PA protection, while regulating tourism is essential to mitigate impacts on the area.

### **7. Tokalo WLS, Mizoram (2022-23):**

Located in the Mara Autonomous district Council (MADC) area and administered under the Siaha Forest Division, the PA was initially notified as a TR by the MADC in 2006 and was finally designated as a WLS in 2007, covering approximately 250 Km<sup>2</sup>. The PA is bordered by the Kolodyne river, the largest river in Mizoram, and is locally known as Kiasie-Tlapi. It features excellent evergreen and semi-evergreen forests, along with extensive bamboo brakes, supporting several RET species of plants and animals endemic to the northeastern Himalayas. The PA holds significant hydrological, cultural, and landscape values. The previous management plan was valid until 2021, and a new plan is currently being prepared.

Surrounding the PA are five villages with a combined population of 2,592, which makes the area vulnerable to customary hunting, illegal extraction of forest resources, livestock grazing, forest fires, and insect attacks. Additional management challenges include shortages of human and financial resources, poor protection infrastructure, human-animal conflict, habitat degradation, a lack of ecological research and monitoring, and inadequate nature education and eco-tourism programs.

**Recommendations** - Recommendations include improving staff numbers and training, enhancing protection infrastructure, increasing financial allocations with timely fund releases, finalizing the management plan preparation, conducting long-term collaborative ecological research and monitoring, developing an interpretation center, and implementing nature education programs. Engaging local communities in participatory eco-tourism can provide income for residents and support PA protection. Furthermore, collaborating with local leadership and stakeholders to discourage customary hunting and adopting trans-boundary conservation strategies with the Myanmar FD through landscape-based planning are essential for effective management.

### **8. Pualreng WLS, Mizoram (2023-24):**

The PA, covering 50 Km<sup>2</sup> in Kolasib district, was initially



notified on 29 July 2004, with the final notification issued on 10 December 2013. An ESZ has also been established. The PA features hilly terrain with wet, dense evergreen and semi-evergreen forests, complemented by numerous springs and streams. It serves as the catchment for the river Turial and the hydroelectric project constructed on it. The area is rich in RET species, including the Clouded Leopard, Malayan Sun Bear, Hoolock Gibbon, Slow Loris, Binturong, Phayre's Leaf Monkey, and four species of hornbills, along with various pheasants, partridges, and butterflies. The management has begun engaging with local communities.

Surrounding the PA are six villages that exert low resource extraction pressure, although some illegal hunting and fishing activities are reported, particularly during the winter months. The PA faces several challenges, including poor protection infrastructure, inadequate river patrolling, a lack of basic ecological information, insufficient restoration activities for Jhum-impacted habitats, absence of ecological monitoring, and inadequate eco-tourism and nature awareness initiatives.

**Recommendations** - Recommendations include improving staff numbers, capacities, and amenities; organizing regular patrolling of water bodies; planning urgent eco-restoration works in degraded areas, particularly abandoned Jhum plots; surveying and documenting RET species with regular monitoring; enhancing community participation through eco-development, including eco-tourism; and improving nature education and awareness in the local area.

## 9. Thorangtlang WLS, Mizoram (2023-24):

The PA, located in Lunglei district, western Mizoram, was initially notified in 2002 with an area of 50 Km<sup>2</sup>. This area was later expanded to 198 Km<sup>2</sup> by including contiguous northern forest areas and two villages, and it was renotified in 2013. Situated close to the Indo-Bangladesh border and contiguous with dampa TR to the north, the PA serves as an important elephant corridor and is administered by the DFO (Wildlife Division), Aizawl. The PA features steep slopes covered with evergreen and semi-evergreen forests, along with 18 major water bodies, including the Tut and Kau rivers, and several perennial streams. It supports a range of RET species such as the Clouded Leopard, Leopard Cat, Hoolock Gibbon, Leaf Monkey, Serow, and various birds, including hornbills, pheasants, and raptors. The Mizo Youth Association, an NGO, collaborates with PA management, and camera trap documentation for some RET species has commenced.

However, there are 16 nearby villages that exert resource extraction pressure on the PA. The absence of legally notified internal boundaries has resulted in no demarcation of core and buffer zones. The PA suffers from poor protection and communication infrastructure, a low number of staff, degraded or abandoned Jhum areas, illegal hunting activities, insufficient ecological information on biodiversity, very low funding, and limited tourism opportunities, as well as discrepancies regarding the PA's area.

**Recommendations** - Recommendations include

legally notifying internal boundaries and resolving area discrepancies, undertaking eco-restoration of degraded areas, improving protection infrastructure, increasing staff numbers, capacities, and amenities, systematically estimating populations of RET species along with ecological monitoring, developing participatory income generation programs including eco-tourism with local communities, enhancing fund flows, and extending and strengthening connections to the northern corridor with Dampa TR.

## 10. Buvhum WLS, Mizoram :

Following consultations with the CWLF of Mizoram, it was decided not to visit the Bhuvum WLS at this time. Concerns were raised regarding the final notification status of the sanctuary, which has not yet been issued. Additionally, the local autonomous council is reconsidering the declaration of the area as a WLS. It was noted that a team visiting the site could potentially send a misleading signal to the local council during this critical decision-making period.

*Trend of MEE scores between first and repeat cycles*

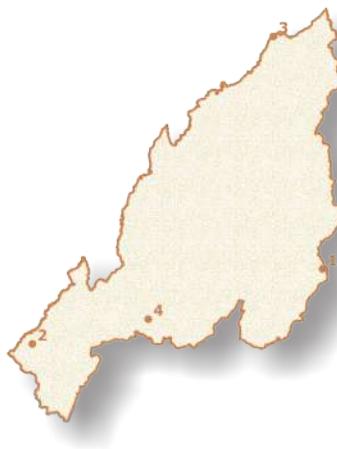
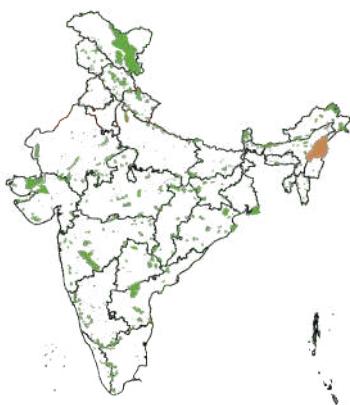
Sl. No	PAs	First Cycle			Repeat Cycle			Trend
		Phase	MEE Score (%)	Category	Evaluation Year	MEE Score (%)	Category	
1	Khawnglung WLS	2017-2018	43.33	Fair	2022-2023	57.03	Fair	▲
2	Lengteng WLS	2015-2017	57.41	Fair	2022-2023	46.88	Fair	▼
3	Murlen NP	2006-2009	71.2	Good	2022-2023	52.34	Fair	▼
4	Ngengpui WLS	2009-2010	72.5	Good	2022-2023	50.78	Fair	▼
5	Phawngpui Blue Mountain NP	2012-2013	57.5	Fair	2022-2023	53.91	Fair	▼
6	Tawi WLS	2015-2017	55.56	Fair	2022-2023	54.69	Fair	▼
7	Tokalo WLS	2015-2017	54	Fair	2022-2023	52.34	Fair	▼
8	Pualreng WLS	2018-2019	73.21	Good	2023-2024	63.28	Good	▼
9	Thorangtlang WLS	2018-2019	67.86	Good	2023-2024	72.66	Good	▲
10	Buvhum WLS	-	-	-	-	Final notification not issued	-	



Nagaland

Indian White - eye © Vivek Sajkar





# Nagaland

Nagaland is located in north-eastern India, spanning over a geographical area of approximately 16,579 Km<sup>2</sup>. The state's forest cover is 12,222.47 Km<sup>2</sup>, accounting for 73.72% of its geographic area (ISFR 2023). In the first and repeat cycle of MEE, 3 PAs were assessed. In the repeat cycle one new PA was assessed and one PA which was previously evaluated under first cycle was excluded as it was falling under State Jhumland Act and not under WLPA, 1972.

## 1. Fakim WLS, Nagaland (2020-22):

An area of 6.14 Km<sup>2</sup> in Fakim village, close to the international border, was acquired by the Government of Nagaland in 1980 and notified as a WLS, with the final notification issued in 2000. This PA is part of a larger network of high-altitude, contiguous community forests extending to Myanmar and serves as an important corridor for connecting eastern Nagaland. Located at the foothills of the Saramati mountain, the PA is characterized by montane wet temperate forests and subtropical scrub, featuring high hills and steep valleys intersected by streams and rivers. The Village Council (VC) actively participates in participatory planning and management, working towards declaring neighbor forests as Community Reserves and contributing to PA protection, nature education, and eco-tourism initiatives. The VC has also adopted a resolution against hunting. There are no villages within the PA.

However, the PA faces several management challenges, including its small size and the VC's unwillingness to cede additional land for conservation. Additionally, there is an absence of an approved management plan, inadequately equipped protection teams, insufficient

protection infrastructure, and a lack of staff, funding, and incentives to work in the difficult terrain. There are also limited facilities for outreach, tourism, and nature education.

**Recommendations** - Recommendations include expediting the declaration process for a Community Reserve to integrate the PA into a trans-boundary ecological landscape, preparing a comprehensive management plan, allocating sufficient human and financial resources, posting at least one additional RO to enhance protection, introducing eco-development programs to help improve local livelihoods, leveraging the potential for eco-tourism to benefit both the community and the PA, and engaging scientific institutions to conduct studies on the flora and fauna of the region.

## 2. Intanki NP, Nagaland (2020-22):

Intanki NP, which extends to 202.02 Km<sup>2</sup> with a core zone of 55 Km<sup>2</sup>, was initially notified as a WLS in 1975 and upgraded to NP status in 1993. Situated along the banks of the Dhansiri and Intanki rivers, it forms part of a critically important landscape that connects fragmented and isolated forest patches in Nagaland

and Assam, particularly towards Karbi Anglong. The park consists of mixed lowland and moist deciduous riverine forests, safeguarding a significant number of threatened flora and fauna. Although the management plan is currently under preparation, the PA features appropriate zonation, with encroachments removed and successful habitat restoration efforts undertaken at evacuated sites. Stakeholders are actively involved in management, and community support is generally positive. Populations of most threatened species are reported to be stable, with low instances of HWC. However, the PA is not open to visitors.

Management weaknesses include the presence of a village within the core zone, ongoing law and order issues, inadequate trained personnel, a missing approved management plan, absence of nature interpretation and eco-tourism activities, delayed compensation payments related to human-elephant conflict, insufficient intra-departmental coordination, lack of human, financial, and infrastructural resources, and a progressive loss of cultural heritage.

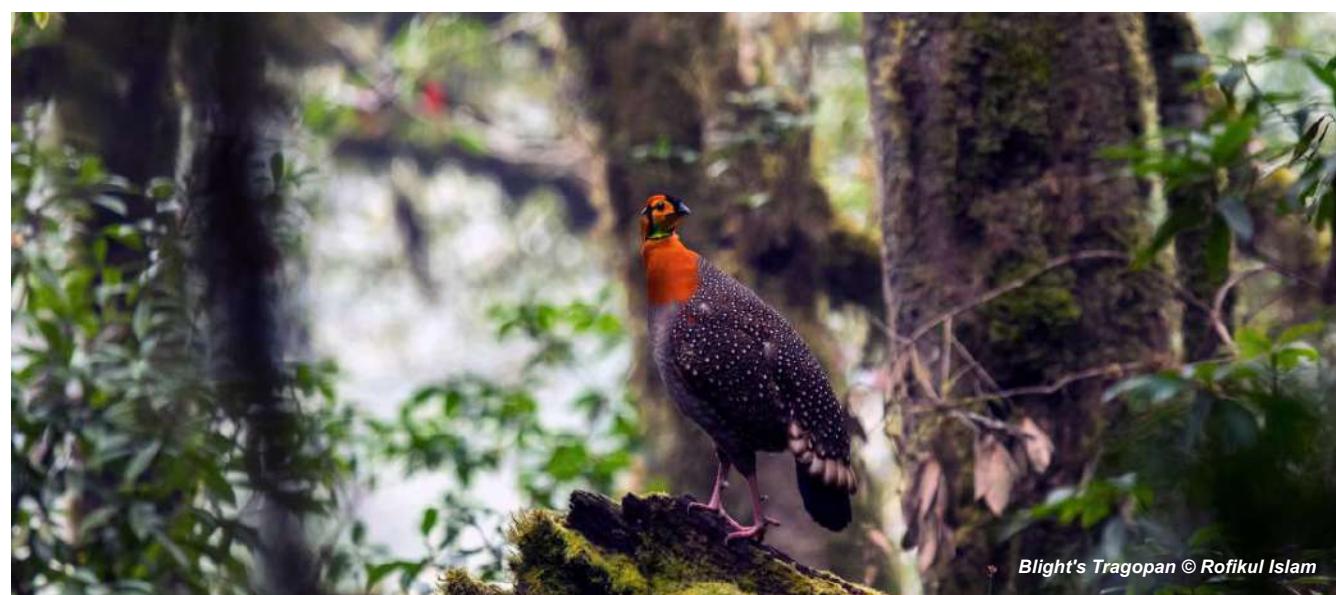
**Recommendations** - Recommendations include improving overall protection infrastructure by enhancing staff numbers and capacities; completing the management plan; fostering better intra-departmental coordination; engaging scientific institutions for studies on various aspects of PA management; opening areas of tourism interest to the public and developing an eco-tourism policy to benefit both the community and the PA; conducting collaborative studies with the Assam FD on elephant corridors; and engaging local communities in preserving culturally significant assets.

### 3. Singphan WLS, Nagaland (2022-23):

The PA, covering 23.57 Km<sup>2</sup>, was originally community land before being purchased by the British administration in 1929 and designated as a RF. It was notified as a WLS in 2009 and designated as an ER in 2018 to protect the Abhapor-Singphan corridor, facilitating elephant movement from Assam to Tirap district in Arunachal Pradesh. The PA represents a remnant of protected evergreen forest in Nagaland, which still harbors endangered species such as the White-winged Duck, Binturong, Asian Elephant, and various other endangered and threatened animals.

The landscape is highly fragmented due to human habitation and development activities, with several unregulated coal mines located along the fringes of the PA. The area faces significant challenges, including inadequate human and financial resources, a lack of basic facilities and training for existing staff, heavy truck traffic in the vicinity related to coal transport, absence of a management plan, insufficient baseline information on the PA, and a lack of ecological research and monitoring.

**Recommendations** - Recommendations include preparing and approving a management plan as soon as possible, providing basic facilities for housing, camping, mobility, communication, and equipment for the staff, regulating coal mining and transport activities along the PA's edges, improving funding, organizing periodic wildlife training for staff members, enhancing publicity and outreach efforts, conducting basic studies on the flora and fauna of the area, establishing an ecological monitoring protocol, and improving overall protection infrastructure.



## Trend of MEE scores between first and repeat cycles

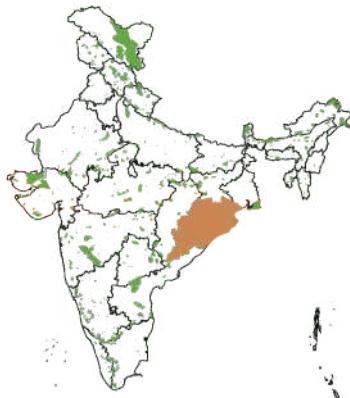
Sl. No	PAs	First Cycle			Repeat Cycle			Trend
		Phase	MEE Score (%)	Category	Evaluation Year	MEE Score (%)	Category	
1	Fakim WLS	2012-2013	48.33	Fair	2020-2022	74.22	Good	▲
2	Intanki NP	2006-2009	58.3	Fair	2020-2022	69.53	Good	▲
3	Singphan WLS	-	-	-	2022-2023	48.33	Fair	-
4	Puliebadze WLS	2015-2017	53.95	Fair	-	Not under WPA (Notified under state Jhumland act)	-	-



Golden Bush Robin © Vivek Sarkar

Odisha

Rhesus Macaques © Uddalak



## Odisha

Odisha is located in eastern India, with a geographical area of 155,707 Km<sup>2</sup>. The state's forest cover is 52,433.56 Km<sup>2</sup>, accounting for 33.67% of its geographic area (ISFR 2023). In the first cycle of MEE, 16 PAs are assessed. In the repeat cycle, 15 PAs are assessed, including one new PA. However, in the repeat cycle, 2 PAs are excluded, as one falls under a CMPA and another is a Zoo, which undergoes a separate MEE evaluation.

### 1. Bhitarkanika NP & WLS, Odisha (2018-19):

Bhitarkanika NP & WLS was notified in 1975 and covers an area of approximately 672 Km<sup>2</sup>. Bhitarkanika in Odisha represents a unique coastal and marine ecosystem, extending over a large landscape with connectivity to Gahirmatha WLS and adjoining territorial forests. This well-known PA serves as a repository for rich mangrove diversity. The NP part has no villages and boasts adequate management and protection infrastructure, staff facilities, equipment, and funding support. With a comprehensive system for regular monitoring of habitats and species, the PA provides excellent opportunities to sight crocodiles.

However, the PA faces significant challenges, including an acute shortage of ROs and frontline staff, substantial biotic pressure from approximately 410 villages located in the WLS portion, the progressive expansion of villages into small townships, large-scale shrimp farming along the PA's fringes, and mining operations that result in pollution of the Brahmani river upstream.

**Recommendations**-Important management Recommendations include rationalizing the boundaries of the PA, particularly for the WLS;

establishing an umbrella institution like a Tiger Foundation to enhance community participation through upscaled EDCs and eco-development programs, ecotourism, and nature interpretation and awareness initiatives; consolidating existing scientific data and creating a digital ecological database; preparing a new management plan; immediately filling existing staff vacancies; and improving publicity and outreach activities.

### 2. Sunabeda WLS, Odisha (2018-19):

Sunabeda WLS was notified in 2009 and covers an area of approximately 789.7 Km<sup>2</sup>. Sunabeda, located in Odisha, is part of a large ecologically significant landscape that includes Udanti Sitanadi TR, Khariar, and Raipur East Divisions, providing a suitable habitat for tigers and their associated species. The forest vegetation and habitats within the PA remain intact, featuring beautiful forest vistas and waterfalls. Despite challenges posed by left-wing extremism, field staff are actively patrolling the area.

However, the PA faces several issues, including left-wing extremism, inadequate protection infrastructure, heavy biotic pressures from surrounding villages, low community participation in management efforts,

insufficient eco-development programs, an overgrowth of invasive weeds like *Eupatorium*, and a lack of ecological baseline data and monitoring.

**Recommendations** - Recommendations for improving management include reviving EDCs and eco-development programs to enhance community engagement, developing livelihood improvement activities and community-centric eco-tourism, pursuing the elevation of the PA to a TR, increasing staff numbers and their training, enhancing habitat management through systematic weed removal, and establishing a robust ecological monitoring system.

### 3. Chandaka-Dampara WLS, Odisha (2020-22):

The PA was notified in 1982, with its boundaries rationalized and fully described in 1988. Located at the northeastern edge of the Eastern Ghats, the PA consists of two disjointed parts: the larger section extends to 172.12 Km<sup>2</sup>, while the smaller portion, near the city of Bhubaneshwar, covers 21.27 Km<sup>2</sup>. Historically, the PA was part of the vast Eastern Ghats and the central Indian elephant range, serving as a stronghold for tigers. The PA acts as the catchment for the Mahanadi river and its tributaries, feeding two large reservoirs within its boundaries and eight on the periphery. The water bodies and marshes attract numerous resident and migratory birds, and the diverse habitats are home to a range of threatened floral and faunal species of the northern Eastern Ghats. Additionally, the PA offers cultural, eco-tourism, and educational values, drawing many visitors from Bhubaneshwar, for whom the PA serves as a vital "green lung." It includes a well-managed animal rescue center, and the protection and eco-tourism infrastructure are considered satisfactory. EDCs are meaningfully engaged in PA protection and eco-tourism initiatives, and an ESZ has been notified.

The PA has one revenue village within its boundaries and 56 villages on the periphery, along with numerous others located within 5 km, all exerting significant biotic pressure on the area. There are over 211 cases of post-1980 encroachments currently under process, with final notification pending due to the need for resolving the rights of local residents. Additional management challenges include high vacancies at the level of Forest Guards, inadequate boundary surveys, a lack of robust scientific monitoring of critical species populations, and a low elephant population.

**Recommendations** - Recommendations include settling the rights of villagers over revenue and private lands designated as parts of the PA, issuing the final notification, consolidating boundaries with masonry

pillars following a DGPS survey, persuading the five villages still residing within the PA to voluntarily relocate, requesting the government to enhance funding to the necessary levels, filling vacancies for Forest Guards, strengthening monitoring of habitats and critical species, organizing in-house wildlife training sessions, and enhancing the eco-development program to benefit both the local community and the PA.

### 4. Chilika (Nalaban) WLS, Odisha (2020-22):

The PA covers 15.53 Km<sup>2</sup> and consists of two sections: Nalaban Island (6.72 Km<sup>2</sup>) in Chilika Lake, along with a one-kilometer-wide buffer zone surrounding the island (8.81 Km<sup>2</sup>). As part of the largest brackish water lagoon with an estuarine character, the PA serves as a vital wintering ground for migratory waterfowl. It is designated as a Ramsar site and is well protected with robust technical support from the Chilika Development Authority (CDA). Protection-related issues are minimal, although illegal fishing within the sanctuary area remains a concern. The boundaries have been consolidated with RCC pillars and secured with two rows of marine-grade PVC steel wires, with 24x7 patrolling in place. The PA plays an integral role in the Chilika waterscape, supporting the livelihoods of 152 neighboring fishing villages.

The PA spans three administrative districts, and the DFO responsible for it oversees multiple territorial areas. Currently, the PA is supervised by only a Deputy RO, which highlights a significant management gap. Challenges include high vacancies among frontline staff, inadequate coordination with the CDA, and minimal protection infrastructure.

**Recommendations** - Recommendations involve improving staff numbers, skills, and deployment for effective management; enhancing protection infrastructure to ensure better security; and strengthening coordination with the CDA and neighboring territorial forest divisions to garner support for the effective management of the PA.

### 5. Debrigarh WLS, Odisha (2020-22):

The PA, covering 353.81 Km<sup>2</sup>, was notified in 1985 and is located in the Chhota Nagpur region of the Deccan Plateau. Dominated by sal forests with abundant bamboo groves, the PA borders the massive Hirakud reservoir and holds significant catchment values, serving as a repository for native biodiversity and winter migratory birds. The PA is rich in historical and cultural significance, making it a popular tourist destination for visitors from nearby towns. EDCs manage eco-tourism effectively, ensuring a proper



Indian Yellow Tit © Vivek Sarkar

revenue-sharing arrangement between the department and the EDCs. Two villages in the core zone have been successfully relocated, and the process is ongoing for the remaining villages. The PA connects to Sonabeda WLS through intervening RFs, facilitating elephant movement between Odisha and Chhattisgarh. Recognizing the connectivity and biodiversity values of the area, a proposed TR extending over 850 Km<sup>2</sup> includes this PA.

However, several challenges persist, including a few villages remaining within the PA and approximately 155 villages bordering it, which exert considerable biotic pressure. Issues such as excessive grazing, illicit felling, trespassing, poaching, and seasonal fires are prevalent. Additionally, licensed fishermen with permits to fish in the Hirakud Reservoir camp inside the PA, causing further biotic disturbance.

**Recommendations** - Recommendations include relocating the remaining villages from the core area; improving overall protection architecture by

enhancing the numbers, skills, and knowledge of frontline staff regarding participatory wildlife management; initiating eco-development programs for the benefit of local communities and the PA; and instituting scientific monitoring of key species and their habitats.

## 6. Gahirmatha WLS, Odisha (2020-22):

The PA was notified in 1997 and encompasses 1,435 Km<sup>2</sup>, of which 1,408 Km<sup>2</sup> is situated in the territorial waters of the Bay of Bengal, while 27 Km<sup>2</sup> comprises landmasses that support mangroves and associated vegetation. The PA features sand spits along a 43 km stretch, where millions of olive ridley marine turtles come for mass nesting, recognized as the largest rookery in the world. The landward area is buffered by the Bhitarkanika NP and WLS. There is satisfactory inter-departmental coordination in the protection of the PA, which attracts many visitors, particularly during the nesting season.



However, the PA faces several management challenges, including large-scale disturbances in the sanctuary's waters caused by fishing vessels, extensive prawn farming in the Mahanadi delta, industrial developments in Paradeep, a new port planned at Dhamra, loss of potential nesting beaches due to sea erosion and cyclones, damage to turtle eggs by wild and domestic carnivores, bright lights along the beach disorienting the turtles, and a shortage of staff.

**Recommendations** - Recommendations include filling staff vacancies and improving overall protection infrastructure; removing encroachments from the mangrove forests within the PA; enhancing the condition of the extended beaches to provide safe and adequate habitat for nesting turtles; upgrading the existing two on-shore protection camps to disaster-resilient structures capable of withstanding strong cyclones and tsunami effects; appointing a dedicated ACF to supervise management of the PA; and instituting eco-development programs to benefit both

the PA and the local communities.

### **7. Hadgarh WLS, Odisha (2020-22):**

The PA covers 179.31 Km<sup>2</sup> and was notified in 1978. It was carved out of RFs from two adjacent wildlife divisions and is managed under two separate administrations: the larger part, Keonjhar, operates under its own approved management plan, while the smaller part, Karanjia, is managed under the buffer plan of the Similipal TR. The entire PA is designated as a core area and is part of the Mayurbhanj Biosphere Reserve, known for its high biodiversity value. Three mining leases have been stopped, and one village has been successfully relocated outside the PA. The area serves as a vital corridor for elephants and tigers, linking Similipal, Hadgarh, and Kudliha. The large Hadgarh reservoir within the PA supports local livelihoods and provides an important wintering habitat for birds. The PA also possesses high tourism potential due to its aesthetic, cultural, and religious significance.

An ESZ notification for Similipal TR includes Hadgarh WLS, leading to anthropogenic pressures and conflicts from 20 villages located around the PA. Additionally, there are 13 settlements in the Keonjhar part and 16 in the Karanjia part. Rights settled under the FRA include 47.2 Km<sup>2</sup> in the Keonjhar section and 10.17 Km<sup>2</sup> in the Karanjia section. The issue of mining leases remains unresolved and is still in lower courts following a Supreme Court ban on such activities in PAs. The management of the PA suffers from inadequate protection and outreach infrastructure, as well as the lack of a unified command and a single management plan.

**Recommendations** - Recommendations include unifying the command structure for the PA and preparing a single management plan that treats both parts as integral components; pursuing a village relocation program using a conversance approach similar to that applied for the successfully relocated village; engaging peripheral villages through livelihood-enhancing eco-development programs; and improving protection infrastructure along with the skills and knowledge of the staff.

### **8. Kapilash WLS, Odisha (2020-22):**

The PA, covering 125.50 Km<sup>2</sup>, was notified in 2011 and is part of the Dhenkanal Forest Division. It serves as a critical link in a larger elephant-tiger corridor extending to the Satkosia and Simlipal TRs. The PA has significant watershed value, acting as a catchment for two of the 13 reservoirs in the Dhenkanal Division. A Special Facilitation Team has been constituted under



Great Nawab © Vivek Sarkar

an ACF to enhance anti-poaching efforts and continuously monitor elephant movements, alongside inter-departmental coordination to assist in protection and mitigate human-elephant conflicts. The DFO has special funds allocated for emergency situations. An animal rescue center and a mini zoo operate within the PA, and several animal crossings have been created to facilitate safe passage for wildlife across linear infrastructure.

However, PA-people conflicts present the most severe challenges to management. Approximately 30 villages populated by largely impoverished communities exert heavy anthropogenic pressure for subsistence living, with many granted rights under the FRA. Human-elephant conflicts are significant, compounded by linear infrastructures such as national highways, railway tracks, and water channels running through the PA, as well as proposals for additional projects. Furthermore, the VFCs established prior to the PA's declaration have ceased functioning.

**Recommendations** - Recommendations include consolidating the recently surveyed PA boundaries; improving staff numbers, capacities, and facilities; reviving the previously established participatory village-based committees; implementing eco-development programs to enhance livelihoods; engaging EDCs in pilgrimage management and protection activities; establishing closer coordination with various development agencies to collectively protect biodiversity and manage HWCs; proposing independent administration for the PA; and expanding elephant monitoring efforts to include other species of concern, especially tigers and their prey.

### 9. Kothagarh WLS, Odisha (2020-22):

The PA, extending 399.5 Km<sup>2</sup>, was constituted from the expansive 5,000 Km<sup>2</sup> Balliguda Forest Division in the Eastern Ghats and was notified in 1981. Located in the central region of Odisha, the PA is characterized by a mix of hills and plateaus, drained by several streams that feed into the Mahanadi river. It comprises moist peninsular sal forests, sal-savannahs, and bamboo brakes, making it a region of rich biodiversity. The PA currently serves as a vital link in the Kothagarh-Chandrapur Elephant Corridor and is proposed to be a major part of the larger South Odisha ER. Approximately 30% of the PA area consists of revenue land and encompasses 65 villages, many inhabited by indigenous tribes, alongside numerous others in the buffer zone. It also holds significant cultural value, although administrative jurisdiction is not centralized under one Range. A management plan has been submitted for approval.

The PA faces massive biotic pressure due to intense resource use by local populations. Issues such as marginal encroachments, unrestricted movement of people within the PA, collection of NTFP, forest fires, and HWCs stem from the ongoing traditional practice of shifting agriculture, known locally as "podu." Additionally, fringe-level insurgency has been reported in the PA, hampering staff movement.

**Recommendations** - Recommendations include planning and implementing eco-development programs to facilitate livelihood improvement, education, awareness, and mutual dialogue; organizing participatory eco-tourism activities;

improving protection infrastructure in collaboration with security forces; requesting the competent authority to issue the final notification of the PA; placing the entire PA under the supervision of an ACF within the divisional administration; and enhancing staff numbers, capacities, and deployment.

## 10. Lakhari Valley WLS, Odisha (2020-22):

The PA, covering 185.87 Km<sup>2</sup>, was notified in 1985 and serves as an ecotone between the Eastern Ghats and the riverine plains of the Rushikulya–Mahanadi system. The PA features a wide plain valley surrounded by densely forested hills, acting as watersheds for several streams and providing passages for wildlife, including elephants. It is included in the buffer zone of the proposed Mahendragiri Biosphere Reserve. In 2020, 41 Spotted Deer from Berhampur University were released in the PA and are currently being monitored. Some habitat improvement and research initiatives have been undertaken. An ESZ has been notified, and a PA Advisory Committee is in place under the Chief Conservator of Forests (CCF) Berhampur.

Inside the PA, there are six revenue villages and 30 encroached habitations, with a pending final notification for an agreed area of 174.95 Km<sup>2</sup>. Managed under the Parlakhemundi Forest Division, the PA faces significant anthropogenic pressures from local populations, particularly along the eastern frontier. Villagers have been informed about a government-supported village relocation program offering attractive financial incentives. Reports suggest that left-wing extremism in the area is declining. Challenges include a decreasing elephant population, poor protection infrastructure, and porous boundaries, which complicate effective management.

**Recommendations** - Recommendations include preparing a management plan through a consultative process and securing immediate approval; surveying the PA boundaries using DGIS technology and consolidating them; continuing efforts to persuade villagers to relocate outside the PA; planning and implementing eco-development programs to improve livelihoods and protect habitats; enhancing protection infrastructure, including staff facilities; undertaking relevant research and monitoring programs; and appointing an exclusive ACF for PA management under divisional administration.

## 11. Badrama WLS, Odisha (2022-23):

Badrama WLS was officially notified in 2009 and extends over 304.63 Km<sup>2</sup>. Along with its neighbor, Khalasuni WLS, it constitutes an important forested landscape primarily comprising tropical moist

deciduous forests, including moist and peninsular Sal forests and Bamboo breaks. Surrounded by a large ESZ of 1,413.96 Km<sup>2</sup>, notified in 2019, the PA is relatively well protected and generally enjoys the support of local communities.

However, there are 27 revenue villages located within the PA, along with associated infrastructure, agriculture, and livestock, which exert high biotic pressure. The area has experienced left-wing extremism, though this is now diminishing, and approximately 23 km of NH 53 cuts through the PA. Other management challenges include staff shortages, water scarcity during summer, low herbivore densities, and a lack of tourism and interpretation facilities.

**Recommendations** - Recommendations include filling existing staff vacancies and constructing more spacious watchtowers for monitoring and eco-tourism; improving staff mobility and communication; organizing periodic wildlife training for staff; systematically planning the removal of invasive species like *lantana* and *eupatorium*; and developing participatory eco-tourism and nature education programs.

## 12. Karlapat WLS, Odisha (2022-23):

Located in the western part of Kalahandi district, this PA extends to 175.5 Km<sup>2</sup> and was notified in 1992. The surrounding forests, covering more than 500 Km<sup>2</sup>, serve as buffer areas for the PA. The area features a mix of dry peninsular Sal and deciduous forests, along with moist deciduous forests containing Bamboo brakes, which support significant wildlife in the region. Elephants from the Kandhamal area use the PA as a corridor for movement. A management plan is in place, and the PA is reasonably well protected with assistance from local communities.

However, more than 100 villages surround the PA, and 19 villages, including 10 revenue villages, are located within the PA, posing serious management challenges. The area has experienced significant left-wing extremism in the past, although reports indicate that this issue is declining. Additional challenges include inadequate infrastructure for managing HWCs, particularly with bears and leopards; low community engagement in eco-development initiatives; resistance from enclaved villagers to relocate from the PA; inadequately trained staff; and a lack of publicity, research, and monitoring efforts.

**Recommendations** - Recommendations include filling existing staff vacancies and organizing periodic wildlife training for frontline staff; developing an animal rescue and veterinary care unit; activating EDCs

by engaging them in community-based eco-tourism with support from local NGOs and institutions; establishing an interpretation center along with nature education and awareness programs, particularly targeting school children; systematically removing invasive weeds; and improving publicity, research, and monitoring efforts.

### 13. Baisipalli WLS, Odisha (2023-24):

Well-protected as part of the Satkosia TR and Mahanadi ER, the PA was initially notified in 1981 and was renotified on 12 July 1999, covering 168.35 Km<sup>2</sup>. A unit of the Mahanadi Basin, the PA predominantly consists of moist deciduous forests, primarily dominated by Sal trees. It is home to 38 species of mammals, including elephants, leopards, Gaurs, Chinkaras, and Mouse Deer, as well as 157 bird species, 68 species of herpetofauna, and 67 fish species. The Deer Park, which houses 270 deer, attracts visitors. The management employs a systematic protection protocol and uses modern technology for daily monitoring of tigers and elephants, including fire protection, habitat monitoring, and population estimation.

Despite these efforts, the PA faces challenges, with 18 enclaved and 43 proximate villages hosting large human and cattle populations that exert significant biotic pressure through NTFP collection (mainly Bidi Patta), livestock grazing, illegal lopping, and bush-meat hunting. The NH 57 crosses the WLS, contributing to disturbances, and during summer, the area experiences severe forest fires and water scarcity. Additionally, there is a lack of adequate ecological information.

**Recommendations** - Recommendations include intensive engagement with local communities to develop income-generating eco-development programs, improving inter-sectoral coordination, enhancing the capacity of PA staff and villagers, promptly filling vacancies, increasing awareness and extension programs, collecting ecological information to inform the new management plan, fostering greater collaboration with scientific institutions and development departments, and implementing systematic weed eradication and habitat improvement initiatives.

### 14. Khalasuni WLS, Odisha (2023-24):

Administered under the Bamra Wildlife Division in Sambalpur district, the PA was notified on 7 January 1982 and covers an area of 116 Km<sup>2</sup>. It adjoins the forest areas of Deogarh, Rairakhol, Sambalpur Forest Divisions, and Badrama WLS, forming part of the

Sambalpur ER and the catchments of the Mahanadi and Brahmani rivers. The PA predominantly features hilly, moist deciduous and moist peninsular sal forests, with 158 recorded floral species. It is home to 42 species of mammals, 33 birds, 41 reptiles, 15 amphibians, 12 fish, and 20 invertebrate species. Management employs a systematic protection protocol and utilizes modern technology for daily monitoring of tigers and elephants, as well as for PA protection, including fire management and habitat monitoring to address HWCs. Two villages have been successfully relocated from within the PA.

However, 38 surrounding villages with large human and cattle populations exert significant pressure on the PA. Management challenges include villagers' heavy dependence on the area for livestock grazing and the collection of NTFPs such as Sal Patta, Mahua flowers, and Sal seeds. The PA also faces issues such as summer fires, silting of water holes, inadequately trained staff, an insufficient protection network, and seasonal crop raiding by wild animals, including elephants.

**Recommendations** - Recommendations include improving overall protection infrastructure, enhancing staff deployment and amenities, actively engaging with local villagers for eco-development and HWC mitigation, desilting water bodies, conducting improved ecological studies and monitoring, and implementing scientific grassland management practices.

### 15. Kuldiha WLS, Odisha (2023-24):

Located in the Similipal–Hadgarh–Kuldiha Landscape in Balasore district, the PA covers 272.75 Km<sup>2</sup> and is part of the Mayurbhanj ER, having been notified on 1 April 1984. The undulating terrain is densely forested, featuring moist deciduous, riparian, and low-elevation dry deciduous and Sal forests. The PA is home to significant wildlife, including elephants, Spotted Deer, leopards, gaurs, and Giant Squirrels, with a resident population of about 70 elephants. The management employs a systematic protection protocol, utilizing a good communication network and modern technology for monitoring elephants, PA protection, including fire prevention, habitat monitoring, and addressing HWCs.

However, the PA is impacted by 12 peripheral villages that exert severe biotic pressure through resource extraction, livestock grazing, forest fires, and illegal stone quarrying and hunting. Additionally, 12 Lodha families have encroached on a small peripheral area of the PA. Foot-and-mouth disease (FMD) is prevalent among the livestock, and the management's

engagement with local communities is inadequate.

**Recommendations** - Recommendations include improving overall protection infrastructure, particularly in the Soro Range, enhancing staff deployment and amenities, actively engaging local villagers in eco-development, PA protection, and HWC

mitigation, relocating the 22 Lodha families, collaborating with scientific institutions for improved ecological studies and monitoring, and implementing awareness and extension programs to educate the community.

*Trend of MEE scores between first and repeat cycles*

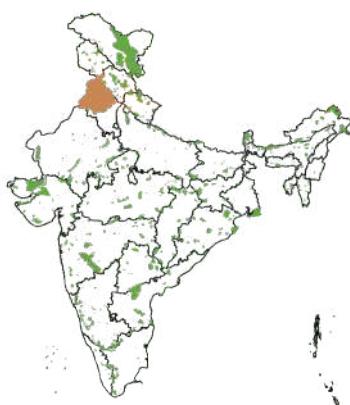
Sl. No	PAs	First Cycle			Repeat Cycle			Trend
		Phase	MEE Score (%)	Category	Evaluation Year	MEE Score (%)	Category	
1	Bhitarkanika NP & WLS	2006-2009	70.5	Good	2018-2019	70	Good	▼
2	Sunabeda WLS	2006-2009	58.3	Fair	2018-2019	61.67	Good	▲
3	Chandaka-Dampara WLS	2009-2010	61.36	Good	2020-2022	66.41	Good	▲
4	Chilika (Nalaban) WLS	2012-2013	65.83	Good	2020-2022	75.86	Very Good	▲
5	Debrigarh WLS	2015-2017	75	Very Good	2020-2022	73.44	Good	▼
6	Gahirmatha WLS	2006-2009	66.7	Good	2020-2022	68.75	Good	▲
7	Hadgarh WLS	2012-2013	55.83	Fair	2020-2022	61.72	Good	▲
8	Kapilash WLS	2015-2017	62.5	Good	2020-2022	65.63	Good	▲
9	Kothagarh WLS	2015-2017	68.33	Good	2020-2022	60.94	Good	▼
10	Lakhari Valley WLS	2015-2017	55.83	Fair	2020-2022	62.5	Good	▲
11	Badrama WLS	2017-2018	73.33	Good	2022-2023	73.44	Good	▲
12	Karlapat WLS	2017-2018	56.67	Fair	2022-2023	60.16	Good	▲
13	Baisipalli WLS	-	-	-	2023-2024	64.06	Good	-
14	Khalasuni WLS	2018-2019	70.83	Good	2023-2024	69.53	Good	▼
15	Kuldiha WLS	2018-2019	64.17	Good	2023-2024	69.53	Good	▲
16	Balukhand Konark WLS	2017-2018	70	Good	-	MPA	-	-
17	Nandankanan WLS	2018-2019	79.17	Very Good	-	Zoo	-	-



# Punjab



Golden Jackal © Vivek Sarkar



## Punjab

Punjab is located in the northern India, with the total area of 50,362 Km<sup>2</sup>. The state's forest cover is 1,846.09 Km<sup>2</sup>, accounting for 3.67% of its geographic area (ISFR 2023). In the first and repeat cycle of MEE, 13 PAs were assessed.

### 1. Abohar WLS, Punjab (2020-22):

The PA, notified in 1975, is a semi-arid region that serves as the westernmost habitat for the Blackbuck population in India, surviving in an agriculture-dominated landscape due to the conservation ethics of the Bishnoi community. It covers an area of approximately 354.25 Km<sup>2</sup>. The PA comprises agricultural lands from 13 Bishnoi villages and has an approved management plan. It plays an important role for small wild animals and their semi-arid habitats. A census of Blackbucks, Neelgai, and trees was conducted in 2020.

However, since the PA is situated on private lands, enforcing the provisions of WLPA poses challenges. Improved irrigation has led to advancements in horticulture and agriculture, resulting in more fenced areas and an increased use of water and pesticides, which progressively reduces the size and quality of the Blackbuck habitat. The PA is hindered by poor protection infrastructure, inadequately trained staff, and delays in fund releases. Additionally, freely roaming feral cows, bulls, and dogs cause significant management issues.

**Recommendations** - Recommendations include improving staff training and deployment; making uniform-wearing compulsory for frontline staff while on duty; increasing funding for the PA; enhancing outreach and publicity efforts by the management; and, given the private land ownership and conservation support in the Bishnoi community, extending conservation efforts to neighboring village lands and renotifying the entire area as a Community Reserve.

### 2. Bir Bhadson WLS, Punjab (2020-22):

The PA is the largest sanctuary in Patiala district and serves as a biodiversity refuge within an agricultural landscape. It was notified in 1995 and covers an area of approximately 667.08 hectares. The final notification has been issued, and the perimeter of the PA is fortified with a high chain-link fence. There are 12 water tanks, some large enough to attract migratory birds. The PA is connected to the Bhorey Aghoul RF on the southwestern side and is in proximity to educational and religious institutions. Some areas within the PA have successfully been planted with various tree species after the removal of *Prosopis*.

However, the PA Advisory Committee has not convened for a long time. Habitat quality is poor beneath the *Prosopis* plantations, and the area is impacted by feral cattle and approximately 10,000 resident Rhesus Macaques. Local people feeding the macaques has led to littering issues, and management efforts are weakened by inadequately trained and uniformed staff, the absence of EDCs, and inadequate outreach programs.

**Recommendations** - Recommendations include exploring the possibility of adding the Bhorey Aghoul RF to the PA; organizing meetings with local stakeholders under the auspices of the PA Advisory Committee to control the movement of feral cattle in the PA; examining the creation of a separate enclosure for the macaques and restricting feeding by locals to that area only; strictly preventing littering within the PA; utilizing the newly developed multi-species areas for nature education and awareness, especially related to habitat restoration; promoting bird watching and nature camps; improving staff training and deployment; and taking action to make the wearing of uniforms compulsory for frontline staff while on duty.

### 3. Harike Lake WLS, Punjab (2020-22):

Harike Lake WLS, notified in 1981 and spanning an area of approximately 85.50 Km<sup>2</sup>, is fed by the Sutlej and Beas rivers and has been recognized as a Wetland of International Importance (Ramsar site) since 1990. It is renowned for its rich avifauna and wetland values, serving as a birdwatcher's paradise that attracts many local, national, and international birdwatchers, thereby supporting the local economy. The sanctuary is home to several endangered species, including the Gangetic dolphin, and features a high-quality draft management plan. The State Wetland Authority (SWA) and Harike Wetland and Eco-tourism Authority (HWEA) have contributed to the development of tourism infrastructure, and local communities are largely supportive of the PA.

However, the PA faces significant challenges, including a long-standing dispute regarding land ownership in certain areas and a long, porous unmarked boundary of about 54 km, making it vulnerable to encroachments and illegal entry by people and cattle. High levels of industrial effluents released from upstream cities and towns have increased pollution in the Sutlej river, while the proliferation of Water Hyacinth, inadequate staffing, lack of uniformed personnel, and absence of participatory management further compound the issues.

**Recommendations** - Recommendations include filling existing vacancies, including the position of the RO; considering the international significance of the PA by appointing an ACF exclusively for it; resolving the land dispute with the irrigation department; organizing more structured meetings of the SWA and HWEA to improve inter-departmental coordination and develop tourism and nature education programs; enhancing protection infrastructure, including staff training, dress code, and deployment; monitoring the populations of threatened species and pollution levels in the rivers; keeping the "Left Marginal Trail" free from four-wheelers and motorbikes while promoting walking or cycling; and establishing EDCs in the peripheral villages to improve participatory management of the PA.

### 4. Bir Aishvan WLS, Punjab (2022-23):

The PA covers 264.40 hectares and was notified in 1952 under the then Patiala and East Punjab law. Located near the town of Sangrur, the PA represents northern tropical dry deciduous forests along with associated flora and fauna. The area features dense vegetation and is enclosed by a chain-linked fence, with mixed species plantations established. Institutional arrangements have been made to enhance community participation, and effective awareness programs are in place. The PA is part of the CAF for migratory birds, and many Recommendations from the previous MEE are being implemented.

However, the PA currently lacks a management plan, faces issues with stray cattle and Rhesus Macaques, and problems are exacerbated by the local community feeding these animals due to religious beliefs. Furthermore, scientific documentation of the area's resources is absent.

**Recommendations** - Recommendations include removing stray cattle from the PA, establishing an interpretation center, developing wetlands or marshy habitats for migratory birds, collaborating with BSI and ZSI to create floral and faunal inventories, persuading locals not to feed cattle and monkeys within the PA, and updating the notification of the PA under the WLPA.

### 5. Bir Bunerheri WLS, Punjab (2022-23):

The PA extends over 661.66 hectares and is administered by the Patiala Forest Division (Wildlife). It is one of the oldest princely hunting areas, initially notified in 1939 and renotified in 1952. Located within a semi-arid biogeographic zone, the PA showcases the flora and fauna typical of the Indus plains, including



reported populations of Hog Deer. It acts as a biodiversity refuge within a predominantly agricultural landscape. The entire perimeter of the PA is fenced, except for about 1,100 meters. Mixed species plantations have been established, and there are institutional arrangements in place to enhance community participation, along with effective awareness programs. The PA is also part of the CAF for migratory birds, and many Recommendations from previous MEE are being implemented.

However, the PA faces challenges, particularly due to a large presence of stray cattle and Rhesus monkeys.

**Recommendations** - Recommendations include removing stray cattle from the PA, establishing an interpretation center within the area, developing wetlands or marshy habitats for migratory birds, and updating the PA notification under WLPA.

## 6. Bir Dosanjh WLS, Punjab (2022-23):

The PA extends over 517.59 hectares and is administered by the Patiala Forest Division (Wildlife). It is one of the oldest princely hunting areas, initially notified in 1952 by the Punjab Government and renotified in 1961. Situated in a semi-arid biogeographic zone, the PA represents the flora and fauna of the Indus plains. Notable features within the PA include the remains of the famous lalkothi (the red mansion) and the Central Buffalo Research Centre. A veterinary doctor is stationed in the area, and 12 cameras have been deployed to monitor key species. The PA has a completely fenced boundary, and mixed species plantations have been established. Institutional arrangements are in place to strengthen community participation, and effective awareness programs are being implemented. Additionally, it is part of the CAF for migratory birds, with many previous MEE Recommendations being followed.

The PA faces challenges from a significant presence of stray cattle and Rhesus Macaques.



Common Snipe © Rajdeep Mitra

**Recommendations** - Recommendations include removing stray cattle from the PA, establishing an interpretation center within the area, developing wetlands or marshy habitats for migratory birds, and updating the PA notification under WLPA.

### 7. Bir Gurdialpura WLS, Punjab (2022-23):

The PA spans 620.53 hectares and represents the Indus plains with a semi-arid biogeography. It is one of the most important PAs in Patiala district and was originally established as a hunting reserve, being notified in 1952. The river Ghaggar runs through the PA, which consists of 36 forest compartments. The eastern boundary of the PA adjoins the state of Haryana, and approximately 11 km of the PA's boundary is fenced. A management plan is in place along with a veterinary doctor, and institutional arrangements have been made to strengthen community participation. Effective awareness programs are being conducted, and the PA is part of the CAF for migratory birds, with 12 camera

traps deployed. Many Recommendations from previous MEE are being followed.

However, management concerns arise from the fact that six of the 36 compartments have not been included in the PA notification. There are several bordering villages that cause biotic disturbances, alongside a significant presence of feral cattle within the PA. Additionally, the water quality of the Ghaggar river is highly polluted.

**Recommendations** - Recommendations include removing stray cattle from the PA, establishing an interpretation center within the area, developing wetlands or marshy habitats for migratory birds, updating the PA notification under WLPA, and periodically monitoring the water quality of the Ghaggar river.

### 8. Bir Mehaswala WLS, Punjab (2022-23):

Bir Mehaswala WLS was notified in 2008. The PA is managed by the Patiala Forest Division (Wildlife) and covers 123.43 hectares, representing the Indus plains of a semi-arid biogeography. Approximately 40 feral bulls have been sterilized, and water can be drawn from borewells in the surrounding villages. The extension wing of the Division handles publicity and outreach functions, with a management plan and a veterinary doctor already in place. Institutional arrangements have been adopted to enhance community participation, and effective awareness programs are conducted. The PA is part of the CAF for migratory birds, and 12 camera traps have been deployed, with many Recommendations from previous MEE being implemented.

However, the PA is surrounded by agricultural fields and villages, and the presence of feral cattle within the PA poses a significant challenge.

**Recommendations** - Recommendations include removing stray cattle from the PA, establishing an interpretation center within the area, developing wetlands or marshy habitats to support migratory birds, and updating the PA notification under WLPA.

### 9. Bir Motibagh WLS, Punjab (2023-24):

The PA, covering 654.37 hectares, was notified on 28 February 1952, and it was formerly a princely hunting reserve of Patiala. It represents the Semi-Arid Biogeographic Zone and consists of notified second-class forests. The PA features heterogeneous vegetation and associated biodiversity and is completely enclosed by a chain-link fence. Mixed-species plantations have been established, and both a



Ant mimicking spider feeding on ant © Anand Sharma

stakeholders' advisory committee and an ESZ monitoring committee have been formed. Approximately 80 hectares have been cleared of *Prosopis* thickets and replanted with native deciduous trees. Regular awareness programs are conducted to engage the local community.

Surrounding the PA are numerous villages and agricultural lands. However, the management faces challenges due to the presence of about 170 stray cattle and several Rhesus Macaques, which locals religiously feed. Significant areas are overrun by *Prosopis* thickets, and there is a complete information deficit regarding the local flora and fauna.

**Recommendations** - Recommendations include a scientifically designed gradual removal of *Prosopis*, followed by the planting of native trees; removing stray cattle from the PA; engaging with local communities to discourage feeding of cattle and monkeys within the PA; procuring vehicles for improved PA protection; developing an interpretation center; creating wetlands or marshy habitats inside the sanctuary as potential landing grounds for migratory birds; documenting flora and fauna with assistance from scientific institutions; and ensuring the provision of adequate funding for these initiatives.

#### 10. Jhajjar Bacholi WLS, Punjab (2023-24):

The PA, located near Anandpur Sahib in Rupnagar

district, covers an area of 116 hectares. It was initially notified in 1998, with the final notification issued on 11 December 2003. The PA features dry deciduous vegetation, including species such as Khair, Shisham, *Prosopis*, and Neem. It supports a diverse range of wildlife, including Sambar, Barking Deer, jackals, hares, several snake species, and migrating leopards. The PA is well protected, with regular removal of exotic weeds and some plantations of mixed native trees. Awareness programs are conducted periodically.

However, a public road runs through the PA, which is frequently used by locals, and the area suffers from a shortage of funds, staff, and protection infrastructure. There is also a lack of scientific information regarding the PA's biodiversity.

**Recommendations** - Recommendations include completing boundary fencing; increasing the numbers, capacities, and deployment of Forest Guards; improving protection infrastructure; enhancing funding; developing wild animal-friendly waterholes; establishing an interpretation center; and conducting comprehensive documentation of flora and fauna with assistance from scientific institutions.

#### 11. Kathlaur-Kushlian WLS, Punjab (2023-24):

The PA, covering 1,896 acres, is situated on the floodplains of the river Ravi and was notified on 22 June

2007. It was established over village forests acquired due to the forest area submerged by the Ranjit Sagar dam. Located adjacent to Himachal Pradesh and near the international border, the PA is a high-security area that is well protected and provides refuge for various wild animals dispersing from Himachal Pradesh and Pakistan. The PA is free from biotic disturbances, making it a potentially important site for interpretation and eco-tourism, and it has basic visitor facilities.

The PA is divided into two sections, Kathlour and Kushlian, located on either side of the river Ravi, and it experiences seasonal flooding. However, it faces challenges including shortages of funds, staff, and protection infrastructure, as well as a lack of ecological research and monitoring, and the absence of an interpretation center. The reported absence of predators has led to an increase in herbivore populations.

**Recommendations** - Recommendations include enhancing protection infrastructure, increasing staff numbers and training, and providing sufficient funding for protection, habitat improvement, and eco-development initiatives; gradually removing *Leucaena* and *Lantana* while planting native trees in the resulting gaps; and conducting regular population estimates of key species with assistance from scientific institutions.

## 12. Nangal WLS, Punjab (2023-24):

The PA, covering approximately 1,125 hectares, is located about 13 km downstream of the Bhakra dam and is a reservoir of the Nangal dam on the river Sutlej. It was notified as a WLS in 2009 and is listed as a Ramsar site. Surrounded by the Shivalik foothills, the PA attracts a variety of resident and migratory birds, including the Black-bellied Tern, Ferruginous Duck, Woolly-necked Stork, Greater Spotted Eagle, Bald Eagle, and Egyptian Vulture, as well as wildlife such as Hog Deer, Indian Pangolin, and leopards. As a tourism site, the PA is well protected and features an interpretation center along with regular awareness programs.

However, the management faces challenges, including inadequate staff and protection infrastructure and a lack of regular population estimation, ecological monitoring, and biodiversity documentation.

**Recommendations** - Recommendations include the documentation of flora and fauna with assistance from scientific institutions; engaging with the local community to discourage the feeding of cattle and monkeys around the PA; and increasing the number of staff posted to enhance management efforts.

## 13. Takhni-Rehampur WLS, Punjab (2023-24):

Representing the Shivalik Hills, the PA covers 382 hectares in Hoshiarpur district and was notified on 8 June 1999. Situated between the plains and hills, it offers a rich habitat for wildlife, including Barking Deer, Pangolins, Pythons, and Khalij pheasants, as well as occasional leopards from Himachal Pradesh. Known for its outstanding natural beauty, the PA attracts nature lovers and bird watchers.

However, the small size of the PA and its proximity to agricultural fields and human habitations result in significant biotic disturbances, including illegal removal of forest products and attempts at encroachment. Management weaknesses include a shortage of staff, inadequate funding, poor protection infrastructure, the prevalence of exotic weeds, and a lack of ecological information and eco-development programs.

**Recommendations** - Recommendations include increasing staff numbers and enhancing their capacities and deployment; strengthening protection infrastructure, including fencing vulnerable stretches of the boundary; developing participatory income generation activities, such as eco-tourism; systematically removing *Lantana* and planting native fruit and fodder trees; conducting regular population estimates and ecological monitoring; and improving the flow of funds for effective management.

## Trend of MEE scores between first and repeat cycles

Sl. No	PAs	First Cycle			Repeat Cycle			Trend
		Phase	MEE Score (%)	Category	Evaluation Year	MEE Score (%)	Category	
1	Abohar WLS	2009-2010	51.56	Fair	2020-2022	55	Fair	▲
2	Bir Bhadson WLS	2015-2017	61.61	Good	2020-2022	60.48	Good	▼
3	Harike Lake WLS	2015-2017	55	Fair	2020-2022	67.97	Good	▲
4	Bir Aishvan WLS	2017-2018	65.83	Good	2022-2023	76.56	Very Good	▲
5	Bir Bunerheri WLS	2017-2018	64.17	Good	2022-2023	82.03	Very Good	▲
6	Bir Dosanjh WLS	2017-2018	62.5	Good	2022-2023	83.59	Very Good	▲
7	Bir Gurdialpura WLS	2017-2018	63.33	Good	2022-2023	83.59	Very Good	▲
8	Bir Mehaswala WLS	2017-2018	61.67	Good	2022-2023	83.59	Very Good	▲
9	Bir Motibagh WLS	2018-2019	65	Good	2023-2024	75	Very Good	▲
10	Jhajjar Bacholi WLS	2018-2019	64.17	Good	2023-2024	64.84	Good	▲
11	Kathlaur Kushlian WLS	2018-2019	58.33	Fair	2023-2024	60.94	Good	▲
12	Nangal WLS	2018-2019	65.83	Good	2023-2024	67.19	Good	▲
13	Takhni-Rehampur WLS	2018-2019	68.33	Good	2023-2024	71.88	Good	▲

Rajasthan



Laggar Falcon © Rajdeep Mitra



# Rajasthan

Rajasthan is located in western India, with a total area of 342,239 Km<sup>2</sup>. The state's forest cover is 16,548.21 Km<sup>2</sup>, accounting for 4.84% of its geographic area (ISFR 2023). In the first cycle of MEE, 19 PAs are assessed. In the repeat cycle, 18 PAs are assessed. However, one PA is excluded as it was previously evaluated in the first cycle but now falls under a TR, which is assessed separately through the MEE process.

## 1. Keoladeo Ghana NP, Rajasthan (2018-19):

Keoladeo NP, notified in 1981, covers an area of approximately 29 Km<sup>2</sup>. A World Heritage Site and a Ramsar site, the PA is an artificially maintained wetland that attracts about 375 species of migratory and resident birds. As a popular destination for both Indian and international tourists, the PA welcomes around 140,000 visitors annually, allowing them to observe birds with minimal disturbance. The management has a long history of collaboration with renowned ornithologists, academic institutions, and NGOs. The tourism sector generates significant employment and revenue for the local community, which participates in protection efforts, nature education, and publicity.

However, the PA requires approximately 550 million cubic feet (m.cft.) of water annually to sustain its ecosystem, and maintaining a regular, adequate water supply poses a major challenge for management. The increasingly frequent drought years, the proliferation of invasive weeds like *Prosopis juliflora*, the African Sharptooth Catfish, and the scientific management of privately owned satellite wetlands in the vicinity are significant management challenges.

**Recommendations** - Important Recommendations include the protection and scientific management of satellite water bodies within and outside Rajasthan; conducting a study to understand the ecological relationships between the PA and satellite wetlands that support the birds; upgrading visitor amenities; implementing measures to tackle increasing alkalinity in the water body; and filling staff vacancies to enhance management effectiveness.

## 2. Bhensrodgarh WLS, Rajasthan (2020-22):

The PA, covering 275.45 Km<sup>2</sup>, was notified in 1983 and is unique for its location at the tri-junction of the Aravalli and Vindhyan hill ranges and the Malwa Plateau. The sanctuary is connected to Mukundra NP in Rajasthan and Gandhi Sagar WLS in Madhya Pradesh through a series of RFs. It forms the northwestern limit of Teak-bamboo forests and serves as the catchment area for the Chambal river, its tributaries, and the Rana Pratap Sagar dam. The PA exhibits a diverse range of habitats and is rich in biodiversity, earning the nickname "sanctuary of reptiles and gorges." It is home to three species of vultures and has the potential to support a significant population of Mugger crocodiles,

adding to its ecological importance. Saddle dam is a popular destination for tourists.

However, the final notification for the PA has not been issued, resulting in ambiguity about its actual boundaries. Within the PA, 35 villages contribute to heavy anthropogenic pressures, further exacerbated by a large population of people and cattle in the surrounding area. Other management weaknesses include a low density of wild ungulates, poor protection infrastructure, inadequately numbered staff, insufficient outreach, and a lack of research and monitoring programs, as well as a significant occurrence of invasive weeds.

**Recommendations** - Recommendations include initiating action to identify and relocate villages occupying critical areas within the PA; addressing area discrepancies by securing the final notification of the PA; improving overall protection infrastructure, including filling vacancies for frontline staff; enhancing staff capacities and facilities; implementing systematic weed removal and habitat improvement programs; requesting the government to establish a "PA Development Foundation, Rajasthan" for alternative funding arrangements for the state's PAs; exploring funding opportunities from Corporate Social Responsibility (CSR) and other agencies; developing eco-development programs with local communities to benefit both the PA and the residents; and improving nature interpretation and eco-tourism activities.

### 3. Desert NP, Rajasthan (2020-22):

Part of the vast Thar Desert, the PA extends over 3,195 Km<sup>2</sup> and was initially designated as a WLS in 1980, with plans to upgrade it to a NP in 1981. However, final notification is still pending. Located at the international border with Pakistan, the PA represents a unique desert ecosystem characterized by sand dunes, semi-arid vegetated mounds, extreme temperatures, and scarce rainfall. It is the only area with a viable population of the GIB, which is also Rajasthan's state bird, alongside other important species like the Chinkara, as well as the tree (Khejri) and flower (*Tecomella undulata*) designated as state symbols. The PA features a specially designed, 178 Km<sup>2</sup> wide enclosure for the conservation breeding and protection of GIB.

Despite its ecological significance, the absence of a final notification has left its actual limits undefined. Within the notified PA, only 50 Km<sup>2</sup> is declared as 'Forest,' leading to pressure from multiple land-use demands. The area is surrounded by 98 villages that exert significant biotic pressure. Additionally, high-

tension power lines and windmills within the PA pose constant threats to the GIB's survival. There is an acute shortage of staff, leaving much of the PA unguarded. Moreover, the availability of irrigation water from the Indira Gandhi Canal has increased vulnerability to marginal agricultural encroachments. Weak connections with stakeholders, including local communities, district administration, and security forces, hinder effective protection of the GIB, especially across non-forest landscapes.

**Recommendations** - Recommendations include issuing the final notification for the NP as soon as possible; ensuring that villages are kept outside the limits of the PA in the final notification; developing eco-development programs with villagers, particularly through eco-tourism, to provide them with income-generating opportunities; increasing staff numbers, capacities, and deployment as necessary; requiring that transmission lines and windmills be fitted with reflectors to help prevent accidents involving the GIB; notifying an ESZ; coordinating with security forces to make them partners in protecting the GIB habitat; and improving overall protection infrastructure, nature interpretation facilities, and ensuring timely release and adequacy of funds.

### 4. Kumbhalgarh WLS, Rajasthan (2020-22):

The PA spans 610.53 Km<sup>2</sup> and was notified in 1971 under the then Rajasthan wildlife act and rules. Serving as an ecotone between the hill forests of the Aravallis and the Thar Desert, the eastern part of the PA is predominantly hilly, while the western section borders the Marwar plains. The sanctuary features diverse topography along with a variety of flora and fauna. It is linked to Todgarh Raoli WLS and neighboring territorial divisions, forming a large landscape that is suitable for establishing a TR. The PA is located about 60 km from the city of Udaipur and includes the famous Kumbalgarh fort, attracting high visitor numbers. The Kumbalgarh hills are also a crucial water source for about 16 rivers and 23 dams downstream, draining towards both the Arabian Sea and the Bay of Bengal. The area holds significant watershed, cultural, and religious values.

However, the PA has experienced habitat degradation and low ungulate density, leading to the local extinction of tigers. There are 22 villages within the PA and 138 surrounding it, creating enormous anthropogenic pressure on habitats and resources. The excessive resource use issue is further exacerbated by



©Aritra Roy

migrating tribal groups and the settlement of rights for some villagers under FRA. Low water availability during the summer months, along with fires and invasive weeds, adversely impacts habitats and wildlife populations. The elongated shape of the PA narrows at certain points, increasing protection vulnerabilities, and there is an acute shortage of staff and funds.

**Recommendations** - Recommendations include initiating a village relocation program; immediately filling existing vacancies for frontline staff and increasing their numbers, capacities, and facilities; issuing the final notification of the PA under WLPA; developing eco-development programs with local communities, particularly eco-tourism related to the fort and other tourist attractions to enhance livelihoods; improving protection infrastructure and inter-departmental coordination; increasing funding for the PA and exploring alternative funding arrangements; enhancing research and monitoring efforts; and considering the proposal to designate the

PA and connected landscape as a TR.

## 5. Mount Abu WLS, Rajasthan (2020-22):

The PA, covering 326.09 Km<sup>2</sup>, was initially notified in 1960, with a reissued notification in 2008. It represents the Aravalli Hills, featuring hills and plateaus with significant biodiversity, watershed, aesthetic, cultural, and religious values. The PA includes Guru Shikhar, the highest peak in the region at 1,722 meters above sea level, and encompasses the town of Mount Abu, a well-known hill station in India. There is notable variation in vegetation along the altitudinal gradient, ranging from dry deciduous forests in the foothills to semi-evergreen forests in higher, sheltered areas. The PA is also a popular destination for bird watchers and serves as a barrier against the eastward advance of the desert. An ESZ has been notified around the PA.

However, the PA faces significant challenges, including high-volume tourism and resource extraction from fringe villages, which create substantial biotic pressure.



There is a lack of proper nature education and interpretation programs, alongside an acute shortage of staff and high staff vacancies. Management issues are compounded by inadequate funding and physical infrastructure, the proliferation of invasive weeds, and human-sloth bear conflicts. Additionally, PA management has limited influence over developmental activities occurring in the ESZ.

**Recommendations** - Recommendations include coordinating with the administrative authority of the ESZ to establish an efficient waste disposal and management system to keep the area pollution-free and prevent sloth bears from entering populated areas in search of food; proposing the PA manager as the Chairman of the inner core of the ESZ surrounding the PA; activating EDCs to enhance participatory eco-tourism, along with nature education and interpretation programs; conducting scientific monitoring of habitat changes and the populations of critical species; and improving protection

infrastructure, funding, and staff numbers and capacities.

## 6. Sitamata WLS, Rajasthan (2020-22):

The PA, located at the tri-junction of the Aravalli and Vindhyan hill ranges and the Malwa plateau, covers 422.25 Km<sup>2</sup> (comprising 359.60 Km<sup>2</sup> of RFs and 63.35 Km<sup>2</sup> of protected forests). This area exhibits unique biodiversity and is zoogeographically significant as it represents the northwestern limit of Teak-Bamboo forests and associated fauna. The PA predominantly features dry deciduous forests with dense, linear riverine forests along stream courses, and it holds important watershed and religious values. It has the potential to support good populations of Flying Squirrels and Chousinghas. A management plan is in place, and there have been commendable biodiversity studies conducted by local universities and NGOs.

However, challenges include ambiguity regarding the actual size and boundaries of the PA, non-issuance of the final notification, and the presence of 21 villages within and many more on the periphery, resulting in significant biotic disturbances. The PA also experiences massive visitation from pilgrims to Sitamata Temple throughout the year, alongside poor interpretation and visitor facilities, staff shortages, inadequate capacities, insufficient protection infrastructure, and high levels of weed infestation.

**Recommendations** - Recommendations include issuing the final notification of the PA; initiating a village relocation program; immediately filling existing vacancies for frontline staff and increasing their numbers, capacities, and facilities; developing eco-development programs with local communities, especially in relation to pilgrimage management for livelihood improvement; establishing a nature interpretation center and enhancing facilities for pilgrims; improving protection infrastructure; increasing funding for the PA and exploring alternative funding arrangements; and building a scientific information base for the PA.

## 7. Bandh Baretha WLS, Rajasthan (2022-23):

Located in the Vindhyan Plateau, the PA covers 198.30 Km<sup>2</sup> and was notified in 1985. After denotifying two blocks and adding a large area, a new proposal for a PA of 370 Km<sup>2</sup> has been prepared, and the final notification for this revised area is awaited. The PA represents dry deciduous mixed forests and is home to many endangered and threatened species. Tigers were reported in the area until the 1980s. Currently, there is



Desert Fox © Prayas Auddy

no management plan since the planning process is contingent on the issuance of the final notification. Aside from reductions in illegal mining, none of the previous MEE Recommendations have been complied with.

The PA suffers from a lack of sanctioned staff strength, heavy livestock grazing pressure, resource dependence of local villagers, low herbivore abundance, absence of eco-development and eco-tourism initiatives, lack of involvement from local NGOs or institutions in management, and insufficient research and monitoring activities.

**Recommendations** - Recommendations include issuing the final notification as soon as possible; preparing an Annual Plan of Operations (APO) for management activities until the revised notification is issued; planning for the deployment, training, and provision of amenities for staff in the proposed PA area; continuing systematic habitat improvement programs; scientifically planning for the rewilding of existing areas with herbivores; providing employment to local people for the development of the new area; and involving WII, local institutions, and NGOs in the planning of the expanded PA.

## 8. Bassi WLS, Rajasthan (2022-23):

The PA, known as Bassi WLS, extends over 138.69 Km<sup>2</sup> and was notified in 1988, originally as a hunting reserve of the erstwhile Banaras State. It is characterized by a diverse mix of habitats, including dry deciduous forests, and is vital for the conservation of species such as the Panther, Chinkara, Wild Boar, Chital, and Four-

horned Antelope. Enhancing its ecological significance, the PA is buffered by forests from the Chittorgarh Division, which provides important corridors for wildlife movement. The presence of water bodies, including the Orai and Bassi dams, not only supports a rich array of flora and fauna but also attracts tourists, especially to the historical and religious sites in the area, like Jharia Mahadev and Tukara Mata.

Despite its strengths, the PA faces significant management challenges such as a high presence of biotic pressure from 12 villages within and 40 surrounding the sanctuary, contributing to resource extraction and habitat degradation. The PA suffers from approximately 50% staff capacity, lack of mobility, and inadequate infrastructure, which hinders effective wildlife management. While no incidents of HWC have been reported in the last three years, the PA is still vulnerable due to a low prey base and limited tourism potential despite excellent opportunities for eco-tourism.

**Recommendations**- Immediate actionable points include increasing human resources, enhancing mobility for frontline staff, and securing improved infrastructure and financial support. Engaging EDCs in eco-tourism activities and training local youth as tourist guides could enhance community involvement. There is also a need for public awareness regarding compensation for livestock loss due to wildlife, ensuring that cases are reported. Furthermore, scientific research and documentation should be improved through collaborations with local universities or reputable institutions. The upcoming

management plan should address landscape planning, including corridor linkages with surrounding territorial forests, in addition to pursuing the proposal for including adjacent forest areas.

### 9. Jaisamand WLS, Rajasthan (2022-23):

The PA, covering 52.88 Km<sup>2</sup>, forms the catchment for the famous Jaisamand lake and numerous other water bodies. It was notified as a WLS in 1955. The area features undulating terrain with steep escarpments and tropical dry deciduous forests. The PA is home to 256 plant species, 21 mammal species, 227 bird species, as well as various reptiles, amphibians, and fish. Notable ancient forts, temples, and water bodies within a forested landscape attract many tourists. The PA is surrounded by RFs of the Udaipur Division to the north and east, and movement of Sloth Bears has been reported through these forests. Of the proposed 34 km boundary wall, 6.8 km has been completed, enhancing protection efforts for the PA.

Despite its ecological significance, the PA faces challenges such as livestock grazing, annual fires, inadequate protection infrastructure, and limited staff amenities. Availability of drinking water is insufficient, there is a low prey base, EDCs are inactive, and there is a lack of eco-tourism, publicity, and wildlife research and monitoring programs.

**Recommendations** - Recommendations include improving protection infrastructure as well as staff amenities, capacities, and mobility; enhancing eco-tourism infrastructure to leverage the area's outstanding tourism potential, while involving local communities in planning and implementing community-based eco-tourism programs; increasing funding availability; developing patches of grasslands in areas occupied by *Prosopis*; and collaborating with local institutions and NGOs to improve publicity, nature education, interpretation, and wildlife monitoring efforts.

### 10. Jamwa Ramgarh WLS, Rajasthan (2022-23):

The PA, located in the Aravalli hills, extends to 300 Km<sup>2</sup> and was notified in 1982. It is predominantly characterized by *Anogeissus pendula* forests interspersed with dry thorny patches and serves as an extension of Sariska TR, managed as its buffer zone. The PA is an important habitat for lesser cats, along with several critical wildlife species. It features numerous historical and religious sites, as well as three dams and one fort. The PA has adequate manpower

and resources, and the department is conducting regular training to enhance the skills of frontline staff.

However, the PA faces significant challenges, including the presence of 83 villages and 66.29 Km<sup>2</sup> of revenue land, which exert heavy biotic pressure. Issues such as water scarcity, lack of involvement from NGOs and scientific institutions, an expired management plan, and inactive EDCs further weaken effective management.

**Recommendations** - Recommendations include preparing an updated management plan immediately; expediting the settlement of rights for people occupying land within the PA and the issuance of final notification; activating eco-development programs to improve livelihoods and protect the PA; organizing wildlife management training for staff; enhancing tourism facilities; improving publicity, nature education, and interpretation programs; and consulting experts to release a few female tigers to help integrate a male tiger that has recently moved in from Sariska.

### 11. Kesarbagh WLS, Rajasthan (2022-23):

The PA, located in the Vindhyan plateau near the Chambal river, covers an area of 14.76 Km<sup>2</sup> and was notified in 1955. It is dominated by *Anogeissus pendula* and characterized by a dry deciduous landscape, serving as habitat to species such as Sloth Bears, Hyenas, Spotted Deer, Wild Boars, Blue Bulls, And Porcupines. The PA is tenuously connected to two other PAs, namely Van Vihar and Ram Sagar.

Regrettably, this is one of the most neglected PAs in Rajasthan, facing significant challenges due to inadequate manpower, limited infrastructure, poor mobility, and insufficient financial resources. Additional management problems arise from sporadic illegal mining, livestock grazing, marginal encroachments, a widespread presence of *Prosopis*, and the proximity of a military school.

**Recommendations** - Recommendations include preparing a management plan immediately to activate necessary management actions; improving protection infrastructure, including increasing staff numbers, capacities, amenities, and deployment; systematically removing *Prosopis* and developing fodder areas for wild herbivores; engaging with military school authorities to seek a consolidated area under Forest Conservation Act (FCA) at the fringe of the PA; planning to strengthen connectivity with the neighboring PAs; and involving NGOs to develop income-generating eco-development programs, such as eco-tourism, in

collaboration with local villagers.

## 12. Phulwari Ki Nal WLS, Rajasthan (2022-23):

The PA, extending over 511.41 Km<sup>2</sup>, was notified in 1983, with its administrative headquarters located in Kota. Comprising excellent forests of the Aravallis, the PA serves as an important watershed for the Sabarmati river and provides vital corridors for local wildlife. The PA's boundary includes a rubble stone wall and fencing along some sections, and there has been some improvement in eco-tourism facilities.

However, the PA faces significant challenges due to the presence of 134 villages within its boundaries and 53 villages on the periphery, resulting in substantial biotic pressure. Management is weakened by limited manpower and financial resources, non-availability of sufficient weapons and modern equipment, restricted mobility, poor infrastructure, and inactive EDCs.

**Recommendations** - Recommendations include taking action to secure the final notification of the PA; developing income-generating eco-development programs, such as community-based eco-tourism, to engage and activate EDCs; improving protection infrastructure, along with human and financial resources; involving NGOs and scientific institutions in wildlife research and monitoring; and enhancing publicity and outreach to attract wildlife enthusiasts and nature lovers to the PA.

## 13. Ramsagar WLS, Rajasthan (2023-24):

The PA, extending over 348.72 Km<sup>2</sup>, was notified on 21 October 1997. It is an important catchment for the river Chambal and is dominated by *Anogeissus pendula* and associated dry deciduous, thorny vegetation. The PA is home to species such as leopards, Sloth Bears, Hyenas, Sambar, Chital, Wild Boars, Nilgais, and Porcupines. It serves as a corridor to the Dholpur-Karoli TR and constitutes a significant part of the Ramsagar Wetland, with a draft notification of the ESZ published on 19 October 2015.

However, the PA currently lacks an approved management plan and suffers from high biotic interferences, inadequate staffing, insufficient training, and a lack of funds. The facilities for interpretation and eco-tourism are poor, and there are no basic ecological inventory and monitoring programs in place.

**Recommendations** - Recommendations include preparing and obtaining approval for a management plan; improving staff numbers, training, and

deployment; enhancing visitor facilities and outreach programs; increasing the flow of funds; and conducting improved scientific studies and monitoring of both populations and habitats.

## 14. Sajjangarh WLS, Rajasthan (2023-24)

The PA, covering 5.19 Km<sup>2</sup>, was notified on 17 February 1987 and is located near Udaipur City, representing the Aravalli Hill Ranges. The Sajjangarh Palace, which overlooks Udaipur City, is situated within the PA and attracts a significant number of visitors. The terrain is hilly and undulating, with the PA surrounded by territorial forests of the Udaipur Division. It is primarily dominated by tropical dry deciduous forests, housing a variety of mammals, birds, and herpetofauna. The PA is well protected by a boundary wall, and there are no human settlements within its limits. The ESZ around the PA has been finalized, and an EDC is functional, with good inter-sectoral and NGO coordination.

However, the PA faces biotic pressures from neighboring cities and villages, and it is prone to fires. The densities of wild animals within the PA are very low.

**Recommendations** - Recommendations include the promulgation of the final notification for the PA; the immediate preparation of a management plan; the development of a long-term landscape-level plan that integrates PA management with the management of the Badi Mahseer Conservation Reserve; and improved outreach functions.

## 15. Shergarh WLS, Rajasthan (2023-24):

The PA, covering 98.8 Km<sup>2</sup>, was notified on 25 May 1992 in the Baran district. It lies within a linear stretch of forest in the Vindhyan range and is surrounded by agricultural and settlement areas. An ESZ has been proposed, which includes 38 villages. The PA constitutes part of the catchment area for the river Parvan and is predominantly a dry deciduous forest, characterized by an *Acacia catechu*- *Anogeissus pendula* -Bamboo community. It provides habitat for species such as leopards, wolves, Hyenas, Chinkaras, and both White-backed and Red-headed Vultures. The PA is strategically located between Mukundara TR, Gandhisagar WLS, and Kuno-Palpur WLS and has been included in the planned Rajiv Gandhi Biosphere Reserve. It is recognized as a good eco-tourism site and has a few operational EDCs.

However, the PA faces several management challenges, including one revenue settlement with seven

households inside the PA and a large population of forest-dependent communities and livestock around it, exerting severe biotic pressure. The new management plan for the period 2023-32 is pending approval, and the PA suffers from 67% staff vacancies, inadequate training, and insufficient ecological research and monitoring.

**Recommendations** - Recommendations include promulgating the final notification of the PA; preparing an integrated landscape-level plan; obtaining approval for the new management plan; securing final notification of the ESZ; filling staff vacancies and providing appropriate training for staff and EDCs; implementing systematic ecological research and monitoring; developing a participatory eco-tourism plan around the Parwan river and Shergarh Fort; and improving awareness and outreach activities.

### 16. Tal Chhapar WLS, Rajasthan (2023-24):

Located on the fringes of the Great Indian Thar Desert, the PA was first notified as a "Reserved Area" in 1962. After settling the rights of the local people, the area was finally notified as a WLS on 23 August 1998, covering 719 hectares. The PA features flat savannah-grasslands dotted with scattered *Acacia* and *Prosopis* trees. It is home to more than 15 species of mammals, 290 resident and migratory birds, 10 snake species, and four species of lizards. The savannah-grassland supports a large population of Blackbucks and serves as an important wintering ground for the Demoiselle Crane and Bar-headed Goose, as well as hosting approximately 35 species of raptors. The creation of extensive grasslands through the systematic removal of woody species, along with good inter-sectoral coordination, has enhanced the PA's ecological value, making it attractive to visitors, especially due to its proximity to the famous Salasar Balaji Temple.

Despite these advantages, the PA does not have a management plan and lacks systematic ecological research and monitoring. A high density of Blackbucks within the PA poses the potential for increased crop depredation, and the presence of feral dogs surrounding the area constitutes further management challenges.

**Recommendations** - Recommendations include preparing a comprehensive management plan with a special focus on Blackbuck and grassland management; ensuring continuous conservation efforts; and bringing the existing rest house under PA administrative control.

### 17. Todgarh-Raoli WLS, Rajasthan (2023-24):

The PA, covering 495.27 Km<sup>2</sup>, was notified on 28 September 1983 and is spread across three districts of the Aravalli region: Rajsamand, Pali, and Ajmer. Adjacent to Kumbalgarh WLS, the PA consists of Dhok and Salar mixed forests, dry lands, seasonal streams, and newly formed sand dunes. This diversity of habitats supports various wildlife, including leopards, Jungle Cats, wolves, jackals, foxes, Hyenas, Sloth Bears, Sambar, Nilgais, and Wild Boars. The PA also acts as a catchment for eight rivers and holds significant historical and religious value. An ESZ covering 202.68 Km<sup>2</sup> was notified on 12 April 2017. Over 10 Km<sup>2</sup> of grasslands have been restored, and popular tourist spots such as Bheel Beri, Goram Ghat, and the Dudheshwar temple contribute to the area's visitor appeal, with active EDCs in operation. The PA has been proposed for inclusion in a TR, and management utilizes the M-STRIPES monitoring system.

Despite these strengths, the PA faces heavy anthropogenic pressure due to the presence of numerous villages and significant religious and historical sites in and around it. Three Public Works Department (PWD) roads traverse the PA, leading to forest fragmentation and vehicular disturbances. Additionally, management is hampered by a 29% vacancy rate among staff, inadequate training programs, lack of an approved management plan, and insufficient research and monitoring efforts.

**Recommendations** - Recommendations include the immediate approval of the management plan; filling existing staff vacancies and enhancing training programs; developing wildlife-friendly crossings on the PWD roads; improving the management of tourism; and conducting systematic ecological research and monitoring.

### 18. Van-Vihar Sanctuary, Rajasthan (2023-24):

Spread across the Vindhyan plateau in Dholpur district, this PA covers 25.66 Km<sup>2</sup> and was notified on 7 November 1955. It is situated near the Urmila Sagar dam and is connected to the Ram Sagar and Kesarbagh WLSs and the Kha NP territorial forest, forming part of the catchment area for the river Chambal. As one of the largest natural tracts among the fragmented forest belts of Rajasthan, the PA primarily consists of *Anogeissus* and *Acacia* thorny vegetation communities. It is home to various species, including Sloth Bears,

Hyenas, Sambar, Chital, Wild Boars, Nilgais, and Porcupines. The PA, which adjoins the Dholpur-Karoli TR, reported tigers until the 1980s. A 1.5 to 5 km wide ESZ has been notified, and some EDCs actively collaborate with PA management. Joint patrolling with the police helps to prevent illegal mining activities.

However, the PA is challenged by the presence of 11 revenue villages on its periphery, which exert high biotic pressure through grazing, lopping and cutting of trees, and encroachments. It also suffers from the absence of a management plan, severe drought during summer months, staff inadequacies and insufficient training, lack of systematic ecological research and

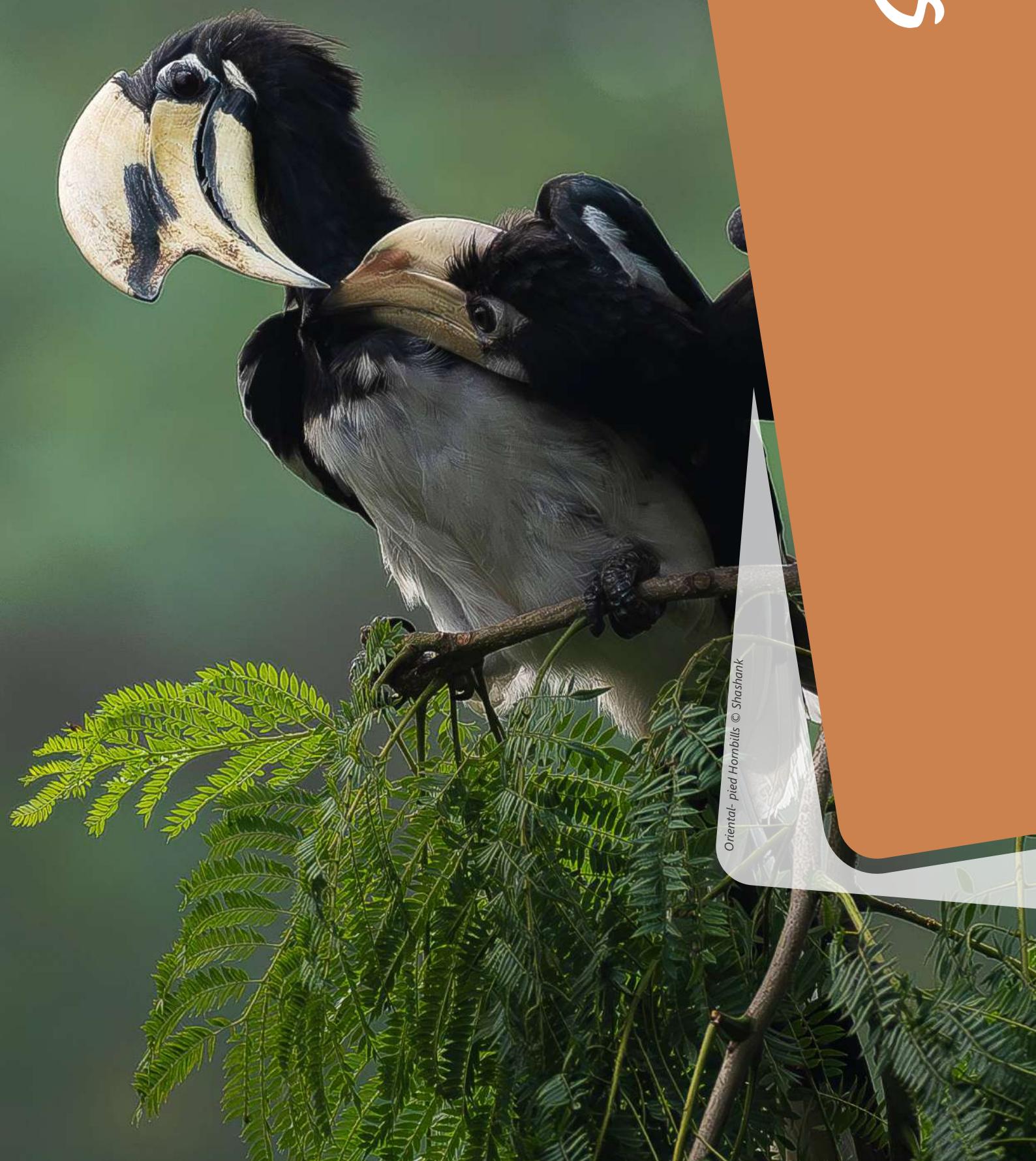
monitoring, absence of signage and visitor services, funding constraints, and increasing incidents of mining violations.

**Recommendations** - Recommendations include preparing a comprehensive management plan; improving the number, capacity, and deployment of staff; conducting systematic wildlife population estimations and establishing scientific ecological research and monitoring; enhancing water availability within the PA; implementing stronger protections to curb illegal mining; and improving visitor services and outreach activities.

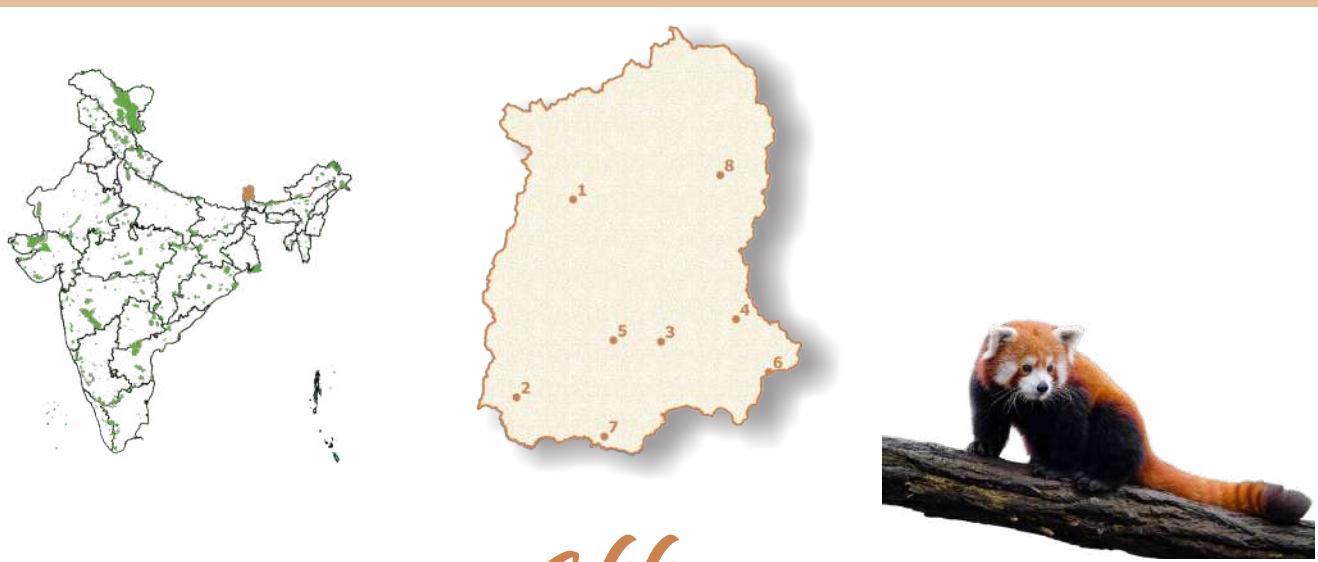
*Trend of MEE scores between first and repeat cycles*

Sl. No	PAs	First Cycle			Repeat Cycle			Trend
		Phase	MEE Score (%)	Category	Evaluation Year	MEE Score (%)	Category	
1	Keoladeo Ghana NP	2006-2009	75	Very Good	2018-2019	72.5	Good	▼
2	Bhensrodgarh WLS	2015-2017	55.83	Fair	2020-2022	49.19	Fair	▼
3	Desert NP	2006-2009	53	Fair	2020-2022	58.06	Fair	▲
4	Kumbhalgarh WLS	2006-2009	59.1	Fair	2020-2022	54.84	Fair	▼
5	Mount Abu WLS	2012-2013	60.83	Good	2020-2022	49.19	Fair	▼
6	Sitamata WLS	2009-2010	58.33	Fair	2020-2022	66.13	Good	▲
7	Bandh Baretha WLS	2017-2018	56.25	Fair	2022-2023	53.23	Fair	▼
8	Bassi WLS	2017-2018	75.83	Very Good	2022-2023	61.72	Good	▼
9	Jaisamand WLS	2017-2018	67.5	Good	2022-2023	69.53	Good	▲
10	Jamwa Ramgarh WLS	2017-2018	56.25	Fair	2022-2023	61.72	Good	▲
11	Kesarbagh WLS	2017-2018	41.07	Fair	2022-2023	45.16	Fair	▲
12	Phulwari Ki Nal WLS	2017-2018	61.67	Good	2022-2023	64.06	Good	▲
13	Ramsagar WLS	2018-2019	29.31	Poor	2023-2024	39.52	Poor	▲
14	Sajjangarh WLS	2018-2019	67.24	Good	2023-2024	70.97	Good	▲
15	Shergarh WLS	2018-2019	39.17	Poor	2023-2024	59.68	Fair	▲
16	Tal Chhapar WLS	2018-2019	67.24	Good	2023-2024	73.44	Good	▲
17	Todgarh Raoli WLS	2018-2019	40.52	Fair	2023-2024	62.5	Good	▲
18	Van Vihar WLS	2018-2019	32	Poor	2023-2024	41.94	Fair	▲
19	Ramgarh Vishdhari WLS	2017-2018	70.37	Good	-	TR	-	-

Sikkim



Oriental pied Hornbills © Shashank



## Sikkim

Sikkim is located in north-eastern India with the total area of 7,096 Km<sup>2</sup>. The state's forest cover is 3,358.40 Km<sup>2</sup>, accounting for 47.33% of its geographic area (ISFR 2023). In the first and repeat cycle of MEE, total 8 PAs were assessed.

### 1. Khangchendzonga NP, Sikkim (2018-19):

Khangchendzonga NP in Sikkim covers an area of 2,586 Km<sup>2</sup> and was notified as a PA in 2000. It forms an integral part of the broader Himalayan alpine and sub-alpine landscape and ecosystem and constitutes an international border along its northern and eastern sides. As a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site, the PA experiences a low level of biotic interference and maintains good relations with neighboring communities. It is part of the Khangchendzonga Biosphere Reserve and is a renowned tourist destination, with several NGOs assisting in management through eco-tourism, waste management, awareness generation, and livelihood support for the local populace.

However, the PA faces several management weaknesses, including a shortage of staff trained in wildlife management, difficult terrain and inadequate protection infrastructure, and the absence of regular censuses of threatened species.

**Recommendations** - Recommendations include preparing a landscape-level plan to integrate PA planning with the larger Biosphere Reserve;

conducting participatory threat analysis; improving staff strength and relocating DFO's office closer to the PA; enhancing coordination with Dzomsa (traditional local governance); improving eco-development programs; regularly conducting censuses of all threatened species; and undertaking institutional ecological research and monitoring.

### 2. Barsey Rhododendron WLS, Sikkim (2020-2022):

The PA spans 104 Km<sup>2</sup> and was notified in 1996 to protect the diverse varieties of Rhododendron species. The area features a diverse terrain and climatic conditions across an altitudinal gradient, descending from sub-tropical moist deciduous forests at lower elevations to temperate moist forests at mid heights, and transitioning to sub-alpine conifer and mixed broadleaf forests alongside alpine meadows. The PA serves as a vital corridor, connecting the Khangchendzonga Biosphere Reserve (KBR) in the north with Singalila NP in West Bengal to the south. It is home to 12 species of Rhododendrons, a variety of epiphytes (including many orchids), and medicinal plants. The sanctuary also supports wildlife such as the Red Panda and the Himalayan Black Bear, making it a

repository of significant biological, ecological, hydrological, cultural, and aesthetic values. There is active participation from EDCs and SHGs in PA protection and eco-tourism initiatives, and good tourism facilities are available.

However, the PA faces challenges, including inadequate baseline information on habitats and population trends for critical animal and plant species; porous boundaries susceptible to encroachment; HWC, especially during winter months when wildlife descends to warmer, human-inhabited areas; protection vulnerabilities along the international border with Nepal and the inter-state border with West Bengal; and heavy tourism resulting in associated pollution.

**Recommendations** - Recommendations include creating proper zonation within the PA; improving habitat management programs, particularly for species like the Red Panda; controlling resource use within the PA through EDCs; engaging more EDCs in managing eco-tourism as well as the processing and marketing of agricultural products, handicrafts, and other cottage industries; enhancing inter-departmental coordination for mitigating HWCs; and improving staff training, publicity, and nature education programs.

### 3. Fambong Lho WLS, Sikkim (2020-2022):

The PA, covering 51.76 Km<sup>2</sup>, is located near Gangtok in Eastern Sikkim and was notified in 1984. It boasts high biodiversity values resulting from its altitudinal gradient, which supports a variety of highly endangered animals and plants. The area is rich in Oaks, containing 7 out of the 11 species found in Sikkim, and it holds significant watershed value, providing drinking water to many downstream villages. The PA features two sacred peaks, has a well-surveyed boundary, and possesses an approved management plan, with a notified ESZ. There are 11 well-established EDCs with a trust fund for revenue sharing, allocating 60% to the EDCs, 20% for PA management, and the remaining 20% to the state government.

However, the PA faces several weaknesses, including inadequate and delayed funding, untrained staff in wildlife management, insufficient protection infrastructure, porous boundaries, and issues related to Oak regeneration. Additionally, part of the PA is encroached upon, with 25 families residing within its limits.

**Recommendations** - Recommendations include relocating the 25 families outside the PA; improving the management of invasive species to assist in oak

regeneration; enhancing staff training and facilities; and improving outreach and publicity programs.

### 4. Kyongnosla Alpine WLS, Sikkim (2020-22):

The PA, covering 31 Km<sup>2</sup>, comprises the high-altitude regions surrounding the famous Tsomgo Lake along the Gangtok-Nathula Pass Road. It was notified in 2005 and receives the highest rainfall in Sikkim, approximately 250 inches annually. The PA functions as the catchment area for the Ratey Chu, which is essential for Gangtok, and encompasses many streams, alpine wetlands, and lakes. Connected to neighboring RFs, it shelters a large number of highly endangered animal and plant species from both temperate and alpine regions, including the Red Panda, which is the state animal. The area is rich in alpine medicinal plants and orchids, notably the Ground Slipper Orchid (*Cypripedium tibeticum*), which is on the verge of extinction and has been introduced in this PA. As an IBA, it's reported to host 230 species of birds, including Sikkim's state bird, the Blood Pheasant. Additionally, it is one of the highest locations where tiger presence has been recorded.

Situated close to the international border, the area sees a prominent presence and continuous movement of armed forces. The high tourist visitation to Tsomgo lake, combined with an inadequate number of PA staff and protection infrastructure, further complicates management challenges. The PA experiences a short working season, illegal collection of medicinal plants, and a severe deficiency of funds and equipment. There are also reports of human-Black Bear conflicts around the PA.

**Recommendations** - Recommendations include improving staff numbers, capacities, and protection infrastructure; enhancing outreach to the armed forces regarding wildlife conservation; increasing funding for the PA; and raising ex-gratia payments to victims of HWCs.

### 5. Maenam WLS, Sikkim (2020-22):

The PA, covering 78.47 Km<sup>2</sup>, is situated close to the town of Ravangla in the South district and was notified in 1987. It is recognized as a treasure house of medicinal plants and is characterized by wet temperate broad-leaved mixed forests and temperate coniferous forests. The PA is home to highly endangered species, including the state animal, the Red Panda, and the state bird, the Blood Pheasant. Notably, in 2017, wild dogs were photographed for the first time in this area. The PA holds significant watershed value as it features



many streams and waterfalls that provide water to nearby towns and villages. Additionally, it possesses high cultural and religious value, housing the historical Buddhist monastery, Maenam Gumpa, and some sacred forests. The PA attracts high visitor numbers for religious purposes and trekking, thereby providing employment opportunities to local communities. It has an approved management plan and receives adequate funding through the Japan International Cooperation Agency (JICA) project and the Centrally Sponsored Schemes (CSS) route, with no reported cases of poaching and general community support for management.

However, the steep terrain presents challenges for patrolling and fire protection, while porous boundaries and multiple tracks complicate management efforts. There is high religious visitation at Maenam Peak during the Ramnavami festival, and fire hazards are present. HWCs have been reported due to Black Bears and Assamese Macaques, along with inadequate travel

allowances for staff and the absence of a regular census.

**Recommendations** - Recommendations include strengthening protection infrastructure by constructing protection camps and patrolling tracks within the PA; establishing check-posts at entry points; improving staff numbers, capacities, and mobility; enhancing interpretation and information displays; setting up a dedicated website for the PA; strengthening EDCs to manage pilgrim and wilderness tourism; developing Upper Dareli as an eco-tourism site; and constructing a few waterholes inside the PA.

## 6. Pangolakha WLS, Sikkim (2020-22):

The PA, spanning 1,280 Km<sup>2</sup>, was notified in 2007. It is connected to PAs and RFs of Bhutan to the east and the Tibetan plateau to the northeast, giving it significant trans-national landscape value. Historically well explored, the PA comprises sub-tropical to temperate wet conifers and broad-leaved mixed forests, as well as



alpine meadows. It boasts high biodiversity, with a range of animals and plants distributed along an altitudinal gradient that varies from 1,800 to 4,345 meters above sea level. Recognized as an IBA, it serves as a stopover site for migratory birds in the CAF and is home to many globally threatened bird species. Additionally, the PA acts as a catchment area for two important rivers and several high-altitude lakes, and it features valuable medicinal plants, important religious and cultural sites, and outstanding scenic beauty. Connected to West Bengal in the south, it also serves as a tiger corridor between the two states.

However, the PA faces challenges due to its strategic defense location, which results in a high presence and movement of armed forces, along with increasing road-building activities. The area is understaffed and lacks adequate coordination with the armed forces. There is a short working season, as well as illegal collection of NTFPs by local populations. HWCs are reported from neighboring villages, and the difficult

terrain complicates patrolling and increases the risk of fires.

**Recommendations** - Recommendations include sensitizing armed forces about biodiversity values and the importance of PA protection; initiating landscape-level planning through trans-boundary conservation initiatives; increasing staff numbers, capacities, and deployment; enhancing compensation for victims of HWC; mapping the tiger corridor and improving its management; creating information portfolios on historical trails and sites; and setting up a dedicated website for the PA.

### 7. Kitam Bird WLS, Sikkim (2022-23):

The only bird sanctuary in Sikkim, the PA covers 6 Km<sup>2</sup> and was notified in 2004. Bounded by the Rangeet river to the west-south and bordering West Bengal, the PA features sub-tropical vegetation, including sal and chir pine trees, as well as a variety of broad-leaved species. It has a well-maintained road network, and local communities are generally supportive of the PA management.

However, National Highway 710 and a state highway crisscross the PA, causing disturbances and making it challenging for management to control traveler activities along these routes. The Sal forests are also prone to fires, and pea fowl from the sanctuary frequently fly into neighboring agricultural lands, leading to crop damage.

**Recommendations** - Recommendations include constructing a few patrolling camps in the interior areas for staff to stay overnight while on duty; promoting community-based eco-tourism; establishing an interpretation center at an appropriate location; improving visitor facilities at the visitor center in Namchi; making proper arrangements for garbage disposal at popular tourist spots and PA watchtowers/camps; and incorporating climate change monitoring into management activities.

### 8. Shingba Rhododendron WLS, Sikkim (2022-23):

The PA, covering 43 Km<sup>2</sup>, is situated in the North district and was initially notified in 1984, with final notification occurring in 2011. It features temperate and alpine vegetation, including 29 species of Rhododendrons. As part of the Kanchendzonga Biosphere Reserve, the PA is connected to Kanchendzonga NP at the landscape level. Located on the way to the Yumthang Valley, this PA has significant tourism potential, and a good management plan is in place.



Lansar Valley, Sikkim © Vivek Sarkar

However, the PA faces several management challenges, including staff shortages, inadequately trained personnel, lack of effective interpretation and visitor management systems, difficult terrain, absence of ecological monitoring, and insufficient information on rare and threatened species.

**Recommendations** - Recommendations include filling existing staff vacancies and providing appropriate training; systematically addressing habitat management, protection, and community

involvement; creating a biodiversity baseline and establishing a system for ecological monitoring; developing eco-tourism initiatives and collaborating with local Panchayats for visitor management and nature education; creating a revenue-sharing mechanism between tourism businesses, Panchayats, and local communities; improving synergy and collaboration between the Wildlife wing and the Territorial wing; and incorporating climate change adaptation strategies into management practices.

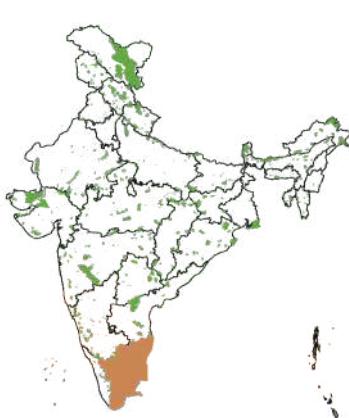
Trend of MEE scores between first and repeat cycles

Sl. No	PAs	First Cycle			Repeat Cycle			Trend
		Phase	MEE Score (%)	Category	Evaluation Year	MEE Score (%)	Category	
1	Khangchendzonga NP	2006-2009	72	Good	2018-2019	77.5	Very Good	▲
2	Barsey Rhododendron WLS	2006-2009	69.7	Good	2020-2022	71.77	Good	▲
3	Fambong Lho WLS	2012-2013	42.5	Fair	2020-2022	57.81	Fair	▲
4	Kyongnosla Alpine WLS	2015-2017	55	Fair	2020-2022	58.59	Fair	▲
5	Maenam WLS	2015-2017	60.83	Good	2020-2022	65.83	Good	▲
6	Pangolakha WLS	2009-2010	77.34	Very Good	2020-2022	57.81	Fair	▼
7	Kitam Bird WLS	2017-2018	51.67	Fair	2022-2023	64.06	Good	▲
8	Shingba Rhododendron WLS	2018-2019	61.2	Good	2022-2023	60.48	Good	▼

Tamil Nadu

Changeable Hawk Eagle © Vivek Sarikar





## Tamil Nadu

Tamil Nadu is located in southern India, spanning over 130,060 Km<sup>2</sup>. The state's forest cover is 26,450.22 Km<sup>2</sup>, accounting for 20.34% of its geographic area (ISFR 2023). In the first cycle of MEE, a total of 29 PAs are assessed. In the repeat cycle, 26 PAs are assessed, and 3 PAs are excluded, as they were previously evaluated in the first cycle but now fall under a TR, which undergoes a separate MEE process.

### 1. Gulf of Mannar Marine NP, Tamil Nadu (2018-19):

The PA, extending over 560 Km<sup>2</sup> across 21 uninhabited islands, was notified in 1986 and is part of the Gulf of Mannar Biosphere Reserve, which encompasses the entire marine space between Rameshwaram and Kanyakumari. This PA features a variety of ecosystems, including coral reefs, rocky shores, sandy beaches, mud flats, estuaries, mangroves, seaweed stretches, and seagrass beds. It is home to a rich diversity of marine life, comprising 147 species of seaweed, 12 species of seagrasses, 13 species of mangroves, 200 species of sponges, 100 echinoderms, 260 molluscs, 90 crustaceans, 450 fish species, five species of sea turtles, 14 dolphin species, six whale species, and the Dugong. Historically noted for its high productive pearl oyster banks, the PA also supports *Balanoglossus*, which serves as a link between invertebrates and vertebrates. Coral collection for the construction and lime industry has been discontinued.

Despite its ecological significance, the PA faces numerous management challenges. Approximately 5000 mechanized trawlers and 25,000 traditional boats rely on the biosphere reserve for the livelihoods of over

300,000 fishermen, leading to severe damage to coral reefs and other habitats. Challenges include illegal collection of seaweeds, sponges, sea cucumbers, sea turtles, fish, and scheduled seashells; disposal of solid and liquid waste; occasional poaching incidents targeting Dugongs, dolphins, and turtles; significant stretches of dead coral reefs and coral bleaching; and nearby thermal power plants, heavy water plants, chemical industries, and salt pans.

**Recommendations** - Important Recommendations include closer coordination with the National Centre for Coastal Research (NCCR) for monitoring coral and marine ecosystem health; focusing on the hatcheries for fish, prawns, and lobsters established by NCCR to enhance the livelihoods of local communities; expanding efforts for coral regeneration; improving surveillance in the nine APCs; and enhancing habitat improvement activities.

### 2. Kanyakumari WLS, Tamil Nadu (2020-22):

The PA, covering 302.09 Km<sup>2</sup>, connects with the buffer zone of the Kalakkad-Mundunthurai TR, making it an essential part of a vast landscape that extends from the Agasthyamalai ER to the proposed Periyar-

Srivelliputtur ER. It was notified in 2005. An ESZ of 196 Km<sup>2</sup>, along with adjacent villages under the Hill Area Conservation Act, has been notified to regulate developmental activities that pose threats to the PA. The area is secured with compound walls and chain-link fences to prevent encroachments in vulnerable zones. Of the 5,000 hectares under the PA, a portion was leased to Aarsu Rubber Corporation to settle Tamil repatriates from Sri Lanka, with about 1,000 hectares returned to PA management. The National Board for Wildlife (NBWL) has authorized salvage felling in ancient Teak plantations.

Despite these measures, the PA suffers extensively from anthropogenic pressures. In addition to the plantations and labor colonies of Aarsu Rubber Corporation, several private enclosures covering 3,170 hectares include multiple plantations and labor camps within the PA. There are 47 tribal settlements in the area, some with rights settled under FRA. Intercropping of banana, pineapple, and Tapioca in young rubber plantations attracts wild animals such as Wild Boars, Sambar, and elephants, leading to HWCs. *Mucuna bracteata*, a leguminous species used as a cover crop in rubber plantations, has spread extensively and become an invasive weed. Furthermore, the cyclone of 2017 damaged wireless repeater stations in the area.

**Recommendations** - Recommendations include the urgent removal of *Mucuna bracteata* from the PA; improving protection infrastructure, especially for buildings affected by the cyclone; protecting virgin forest patches within private enclosures by enforcing existing regulations; filling existing staff vacancies; increasing the number of protection watchers; conducting studies on significant ecological and biological attributes of the PA; avoiding intercropping of fruit species without implementing elephant-proof trenches; filling gaps in salvaged felling areas with fruit trees for wildlife and ensuring proper protection for these trees.

### 3. Mukurthi NP, Tamil Nadu (2020-22):

The PA, covering 68 Km<sup>2</sup>, is recognized for its outstanding beauty and is well known for its Shola-grassland formation. It is home to the Nilgiri Tahr, which is a key species in the PA, along with suitable habitats for tigers, their co-predators, and prey. The PA is naturally protected to the west by steep escarpments and is administered under Mudumalai TR. The state government is considering expanding the area by adding 30 Km<sup>2</sup> from the neighboring Ooty Forest Division. The PA consists of four beats, each with one

protection camp, and effective measures have been taken to control poaching of the Nilgiri Tahr.

Police camps within the PA help prevent insurgent activities, and a tarred road maintained by the electricity department allows access for inspecting the Upper Bhavani Reservoir. However, for staff mobility beyond the reservoir area, the road is not maintained. The old Forest Rest House (FRH) at Bhangi Tapal has been dismantled, and the new one is only partially completed. Additionally, water management practices have not been suitable, leading to reduced summer discharge to streams originating from the Shola forests. Wattle, historically planted for tannin, has invaded many areas of the PA, along with pines and dry grasses in the marshes. The threat of summer fires persists.

**Recommendations** - Recommendations include repairing the road beyond Upper Bhavani Reservoir up to Bhangi Tapal FRH to improve staff mobility; completing the construction of the FRH at Bhangi Tapal to accommodate officers and staff during inspections; increasing the number of protection camps; constructing a building at the western catchment beat for overnight accommodation of staff; and continuing the successful efforts to control fires and poaching.

### 4. Point Calimere WLS, Tamil Nadu (2020-22):

Point Calimere WLS, covering an area of approximately 21.47 Km<sup>2</sup>, is located at the point where the Bay of Bengal and the Palk Strait meet on the Coromandel Coast. The PA was notified in 1978 and holds significant religious importance due to Ramar Padam, which attracts pilgrims. There are no human settlements within the sanctuary. The population of Blackbucks has stabilized after being adversely affected by the Gaja cyclone, and the area is an important site for migrating birds. Five EDCs are operational, primarily focused on tourism management, and there is low conflict with local communities.

The PA has five protection camps; however, they are inadequately maintained, and staff facilities are poor. Several EDCs are not functional, and funding is insufficient, particularly for maintenance and outreach initiatives. Furthermore, challenges include livestock grazing, the presence of salt pans, and marginal fishing by local communities.

**Recommendations** - Recommendations include engaging NGOs for additional resources, especially for managing migrating birds; providing wildlife training



to young foresters who have recently been appointed; activating EDCs to enhance community participation in protection and management activities, and supporting eco-tourism development.

## **5. Pulicat Lake Bird WLS, Tamil Nadu (2020-22):**

Pulicat Lake is the second largest lagoon in India after Chilika and was notified in 2014. It comprises an area of approximately 600 Km<sup>2</sup>. The PA includes private and revenue lands, with the final notification still awaited. As a Ramsar site, it is an assembly of fresh and marine water ecosystems with estuarine characteristics, making it a biodiversity hotspot. The PA serves as a significant wintering ground for migratory birds, hosting several IUCN red-listed and threatened species. The rich fisheries resources of the lagoon sustain the livelihoods of fishing communities in the surrounding villages. The management plan incorporates scientific findings from studies conducted

by BNHS, SACON, and WII. The local community generally supports the PA, which is situated close to Chennai and attracts numerous visitors, including important government officials.

Within the PA, there are 13 villages along with 52 adjacent villages, contributing to considerable biotic pressure. The area is surrounded by various industrial establishments, and the PA faces challenges such as livestock grazing, overfishing, the spread of invasive species, and the influx of industrial effluents and municipal sewage. The ESZ has not yet been notified, and the number of staff and resources available for effective management is insufficient. EDCs only operate during the tourist season, and the rate of siltation is reported to be one meter every 100 years, which is concerning.

**Recommendations** - Recommendations include issuing the final notification for the PA urgently; appointing an exclusive RO along with additional



White-bellied Drongo © Shriya A.

frontline staff; improving the maintenance of mangrove plantations; engaging EDCs in protection and management activities, in addition to tourism; notifying the ESZ to regulate harmful developmental activities, including dredging of the lagoon by local fishermen; and ensuring timely fund flow, especially regarding the wages of protection watchers.

## 6. Srivilliputhur Grizzled Squirrel WLS, Tamil Nadu (2020-22):

The PA, extending over 487 Km<sup>2</sup>, lies linearly along the hilly outcrop on the eastern side of the southern Western Ghats. It was notified as a PA in 2010. Numerous streams run down these hills, feeding many irrigation tanks downstream that support agriculture in the Tamil Nadu plains. The PA forms part of the catchment area for the river Vaigai. Situated in a rain shadow area, the forests are predominantly dry deciduous and scrub types. Along with Meghamalai WLS, it has recently been designated as a TR. The

metapopulation of tigers from Periyar TR has reportedly established home ranges within the sanctuary, making it an important ecological unit on a landscape scale. Access to the PA is limited, with only one motor road, and the majority of the area can be traversed only on foot.

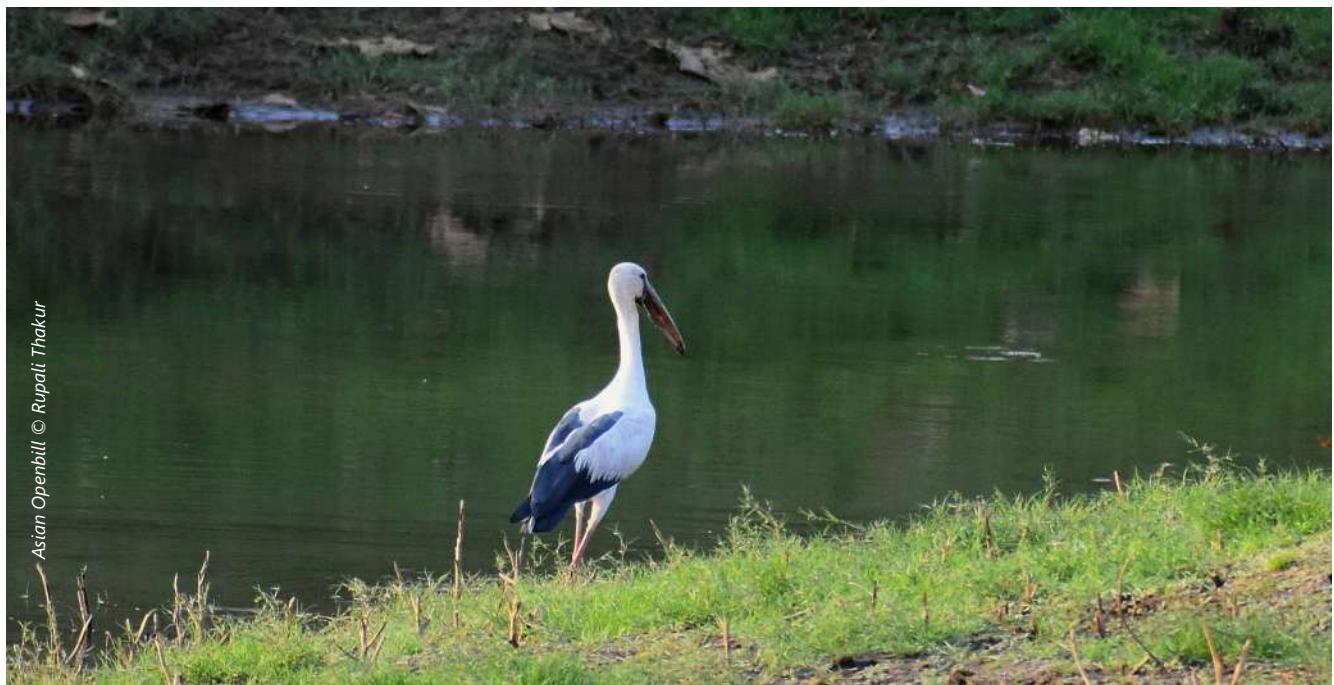
However, several villages border the PA along its entire eastern length, exerting heavy biotic pressure, particularly from livestock grazing. There are also 13 coffee estates along the western boundary that are not accessible by vehicles, resulting in constant movement of estate workers through the PA. Additionally, 30 temples exist within the PA, some with rights of passage, attracting large numbers of pilgrims, especially during August.

**Recommendations** - Recommendations include strengthening protection infrastructure to prevent livestock grazing within the PA; enhancing the effectiveness of EDCs to manage pilgrimage activities, with a special focus on keeping the area free from garbage and fire; and increasing funding to improve visitor-related infrastructure.

## 7. Cauvery North WLS, Tamil Nadu (2022-23):

The PA, covering 504.33 Km<sup>2</sup>, was notified in 2014. The forests are part of the Eastern Ghats and fall within the Brahmagiri–Nilgiris–Eastern Ghats ER, with nearly 6,000 elephants moving across the area seasonally. The PA shares its boundaries with Cauvery WLS and Bannerghatta NP in Karnataka to the northwest, and Cauvery South WLS to the south. As an important conservation area, it provides habitats for a variety of rare, threatened, and endangered plant and animal species. The PA includes a functional forest veterinary unit and an ambulance cum rescue vehicle, along with 10 rapid response teams to address HWC. Various protective measures like elephant-proof trenches, stone wall fences, steel wire rope fences, solar-powered steel wire rope fences, and hanging solar fences have been constructed to mitigate HWC. A management plan is in place.

However, the PA faces significant challenges, including the presence of 15 villages within its boundaries and many more on the periphery, which contribute to biotic disturbances. There is a 50% vacancy rate among frontline staff, and the existing staff are inadequately trained. Moreover, the PA suffers from heavy infestations of invasive species, like *Lantana*. The harvest season often coincides with the movement of elephants into agricultural fields, leading to increased HWCs.



Asian Openbill © Rupali Thakur

**Recommendations** - Recommendations include filling existing staff vacancies and organizing wildlife training programs; documenting elephant population trends in the management plan, ensuring that this information is publicly accessible; creating a baseline database on critical species; systematically removing invasive plants; enhancing funding for protection, anti-depredation, and HWC mitigation activities; and utilizing modern technology, such as camera traps, to estimate populations of important wildlife species.

## 8. Chitrangudi Bird WLS, Tamil Nadu (2022-23):

The PA is an old irrigation tank, extending over 47.63 hectares, and was notified in 1989. Fed by feeder channels of the river Vaigai, the sanctuary is primarily rain-fed, receiving water during the northeast monsoon through various feeder channels. To enhance water availability after the monsoon, four shallow ponds have been created. This predominantly dry deciduous area is characterized by vegetation dominated by Babul (*Acacia nilotica*), *Prosopis juliflora*, and grasses, and it attracts a large number of winter migratory birds. An ESZ has been notified, but the draft management plan is still pending approval. Local villagers have traditionally protected the birds, fostering a strong relationship between the management and the community. The staff numbers are adequate, and a district Advisory Committee is in place.

Nonetheless, the PA faces several challenges, including extensive invasion of *Prosopis* and the

decline of some Babul trees, which serve as excellent nesting sites due to Guano overload. There are no EDCs or livelihood programs in place. Additionally, inadequate funds and poor maintenance of feeder channels adversely affect management efforts.

**Recommendations** - Recommendations include placing the draft management plan in the public domain for wider consultation; ensuring timely release of funds; systematizing habitat management in collaboration with bird and wetland experts; maintaining feeder channels and sluice gates regularly; improving the catchment area; developing eco-development programs with local villagers and establishing eco-tourism facilities; removing *Prosopis* from the PA; and exploring the feasibility of having a biologist and a bird rescue center at the district level.

## 9. Gangaikondan Spotted Deer WLS, Tamil Nadu (2022-23):

The PA, covering 288.40 Km<sup>2</sup>, is reported to be the southernmost habitat for Spotted Deer and is located in the Tirunelveli Forest Division. It was notified in 2013. The PA is surrounded by private agricultural lands and is adjacent to NH 7. It supports a healthy population of Spotted Deer along with diverse species typical of dry deciduous and scrubby habitats. To address fodder scarcity, water conservation structures such as percolation ponds and check dams have been constructed, and planting of fodder species has been initiated. The area has an adequate number of staff, including a biologist, and features a well-demarcated boundary. The Tamil Nadu State Industries Promotion

Corporation (SIPCOT) supplies water to the PA through underground pipelines, and a few signboards along NH 7 help protect Spotted Deer from accidental deaths. Staff members have received training in animal rescue and rehabilitation.

Despite these strengths, the PA's small size, combined with water and fodder scarcity, leads Spotted Deer to venture into surrounding agricultural lands, which increases their vulnerability to poaching, accidental deaths, and attacks by stray dogs. The presence of widespread *Prosopis* further complicates management. Additionally, inadequate funding, poor scientific information, and insufficient publicity adversely affect management efforts.

**Recommendations** - Recommendations include replacing *Prosopis* with native tree species; conducting systematic studies on Spotted Deer habitat; raising the height of the fence to prevent Spotted Deer from jumping out of the PA; ensuring timely and adequate release of funds, particularly for maintaining and increasing the height of the compound wall along NH 7; improving water management; enhancing publicity, eco-tourism, and nature education programs; and improving the wildlife management skills and knowledge of staff.

## 10. Guindy NP, Tamil Nadu (2022-23):

Located at the southwest corner of Chennai, the PA spans 270.55 hectares and was declared a NP in 1978. It effectively serves as the "green lung" of Chennai and functions as a vital groundwater recharge area for the urban landscape. Adjacent to the PA is the Guindy Children's Park, which attracts about nine lakh visitors annually. The presence of Blackbucks within the PA further enhances its ecological significance. The PA is well demarcated, has an approved management plan, and a notified ESZ surrounding it. Additionally, 30 camera traps have been installed within the PA for monitoring purposes. The area does not face issues related to subsistence dependency and acts as a valuable contributor to nature education and interpretation.

However, the PA experiences challenges such as inadequately trained staff, a stagnant ungulate population, and areas of thickly woody habitat that are unsuitable for Blackbucks and Spotted Deer.

**Recommendations** - Recommendations include adopting a total count method for estimating ungulate populations; opening up certain habitats to improve utilization by ungulates; conducting genetic studies to assess inbreeding status in Blackbuck and Spotted

Deer populations; enhancing the visibility of the PA through extensive publicity, including a dedicated new website, brochures, displays, and interactive education programs; and preparing a flood control and cyclone mitigation plan in consultation with Indian Institute of Technology (IIT) Madras.

## 11. Kanjirankulam Bird WLS, Tamil Nadu (2022-23):

The PA, which encompasses an old irrigation tank extending over 104.21 hectares in two segments of the village Kanjirankulam, was notified in 1989. It is part of the ancient Madurai-Ramanathapuram Tank Country and is a rainfed area, receiving water from the river Vaigai through various feeder channels. The arrival of winter migratory birds coincides with the north-east monsoon. Predominantly a dry deciduous region, the sanctuary serves as one of the preferred nesting sites for heronry species and other colonial birds migrating to South India. More than five Near Threatened species have been documented, including Pelicans, Painted Storks, Eurasian Spoonbills, and White Ibises, along with 68 common bird species. The local community has shown strong protection for the birds within the PA.

However, the PA faces several challenges, including widespread occurrences of *Prosopis*, water scarcity due to erratic rainfall, salty underground water, inadequately trained staff, absence of participatory programs and nature education activities, and insufficient financial support.

**Recommendations** - Recommendations include placing the draft management plan in the public domain for wider consultation; soliciting support from bird and wetland experts for habitat improvement; replacing *Prosopis* with native tree species; regularly maintaining feeder channels; improving the catchment area; ensuring timely and adequate release of funds; establishing a bird rescue center with a biologist at the district level; enhancing engagement with local communities to develop livelihood improvement programs; and improving eco-tourism infrastructure.

## 12. Karaivetti Bird WLS Tamil Nadu (2022-23):

The PA, extending over 453.72 hectares, represents an ancient water storage system that supports agriculture in the dry, rain-fed areas of Tamil Nadu. It is an old irrigation tank that receives water from Mettur dam through the Pullambadi canal and is managed by the PWD. During the north-east monsoon period, the area provides excellent habitats for approximately 124

species of resident and migratory birds, including many endangered and threatened species. Recognizing its importance as a bird habitat, the PA was notified in 1999. The optimal time for bird watching is from January to April when bird populations are at their peak. Although there are no motorable roads inside the PA, the tank bund serves as a wide earthen road that provides year-round access to the sanctuary. Local communities are supportive of bird protection, and the PA is detailed on the departmental website.

Despite its ecological significance, the PA suffers from inadequate socio-political attention, absence of a scientific management plan, lack of publicity and eco-tourism initiatives, and insufficient research on habitat quality and avian population assessments.

**Recommendations** - Recommendations include preparing a scientific management plan through a consultative process as soon as possible; improving publicity for the PA through proper signage, displays, informational materials, and interpretation programs; enhancing current tourist facilities; training local individuals to serve as bird watchers and guides; engaging local populations to develop livelihood improvement programs; and ensuring timely and adequate release of funds for effective management efforts.

### 13. Karikilli Bird WLS, Tamil Nadu (2022-23):

The PA was notified in 1989 and consists of two rain-fed irrigation tanks, covering an area of 61.21 hectares. It is enclosed by a three-meter-high and 1,742-meter-long earthen bund. The water collected mostly during the north-east monsoon is utilized until March–May, coinciding with the arrival and stay of winter migratory birds. The vegetation primarily includes *Barringtonia acutangula* and *Acacia nilotica*. Located near the Vedanthangal Bird Sanctuary, the PA has not received adequate publicity. Being a Ramsar site, the birds in this area have historically been protected by local communities, who actively support PA management. There is high potential for nature education and eco-tourism in this PA.

However, several management weaknesses exist, including the absence of a formal management plan and protection strategy, inadequately trained staff, insufficient funding availability, lack of publicity, eco-tourism opportunities, and visitor amenities. Additionally, invasive species like *Azolla* are present in

the reservoir, and there is a lack of relevant research and monitoring, as well as inadequate NGO support.

**Recommendations** - Recommendations include the immediate approval of the management plan; developing a systematic habitat management program; improving staff mobility and amenities; introducing eco-development programs through the establishment of EDCs; enhancing publicity and outreach efforts for the PA; conducting studies on bird diversity, populations, and their habitats; improving the grievance redressal system; and ensuring timely release of funds for effective management.

### 14. Kodaikanal WLS, Tamil Nadu (2022-23):

The PA, located in the Palani hills of the Western Ghats, covers 608.95 Km<sup>2</sup> and supports a diverse array of habitats, providing sanctuary for several endangered, threatened, and endemic species of plants and animals. It was notified in 1998. The significant variation in altitude results in the presence of Shola-grassland and evergreen forests at higher elevations, alongside dry deciduous, scrub, riverine forests, and grasslands at lower elevations. Approximately 150 Km<sup>2</sup> of the PA was designated as part of the buffer zone for Anamalai TR in 2012. The PA has an approved management plan and a notified ESZ, with effective publicity and outreach activities. It receives frequent visits from naturalists, scientists, and tourists, and EDCs manage eco-tourism at four locations on the periphery. Regulated tourist vehicular movement is permitted in selected parts of the PA.

However, the natural forests have largely been replaced by man-made plantations, such as Wattle, *Eucalyptus*, and pines, along with cash crops like coffee, cardamom, and oranges. The PA consists of independent forest blocks separated by agricultural human habitations. Out of the 19 villages in and around the PA, only two have active EDCs. The area also faces a 35% vacancy rate among staff, and systematic population estimations of critical species are lacking.

**Recommendations** - Recommendations include implementing a systematic habitat restoration plan, especially for Shola-grassland and evergreen areas, replacing exotic plantations with native species; ensuring the timely release of funds; improving SMC works; establishing EDCs in all villages and implementing participatory livelihood improvement and PA protection programs; filling staff vacancies and improving staff mobility; ensuring more frequent meetings of the ESZ monitoring committee; reviving the CCTV monitoring centre at green valley; and

improving cross-sectoral coordination.

### **15. Koothankulam-Kadankulam WLS, Tamil Nadu (2022-23):**

The PA, covering 129.33 hectares and comprising two large irrigation tanks, was notified in 1994. The ponds are rainfed and also receive water from the Manimuttar dam to support agriculture in the area. Birds such as Painted Storks and Grey Pelicans have been wintering in these regions for many years and are protected by local villagers. Additionally, paddy fields surrounding the PA are utilized by birds for feeding. A VFC has been established to assist in various management activities within the PA.

Surrounding the PA are 13 villages and hamlets, which contribute to several management challenges. These include water scarcity during lean periods, an increasing population of catfish in the tanks, a lack of vehicular support for staff, inadequate engagement of staff with the VFC, limited funding, and insufficient eco-tourism and nature education programs.

**Recommendations** - Recommendations include improving publicity through the establishment of a dedicated website, enhancing nature education and outreach efforts; ensuring the timely release of adequate funds; eradicating catfish from the tanks; improving road connectivity to Tirunelveli and staff mobility; conducting a study on water budgeting to focus on local agricultural needs and PA requirements; providing systematic wildlife training for the staff; strengthening the VFC, and developing livelihood improvement programs, including eco-tourism.

### **16. Melaselvanoor-Keelaselvanoor WLS, Tamil Nadu (2022-23):**

The PA spans 593.08 hectares and consists of a large ancient village tank that covers two villages. Initially notified in 1998, the final notification was issued in 2010 to protect birds that come to these areas for winter nesting. Local villagers have a long history of protecting these birds. The area is primarily rainfed, with water mostly collected during the northeast monsoon, supplemented by feeder channels bringing water from the river Vaigai. The Spot-billed Pelican and the Eurasian Spoonbill are considered flagship species of the sanctuary. Babul (*Acacia nilotica*) is a preferred tree for nesting and has been extensively planted in the area. Surrounding agricultural lands mark the northern boundary of the PA, and anti-poaching watchers from local villages are engaged in its protection. Institutions such as the Salim Ali Centre for Ornithology and

Natural History (SACON) and BHNS are also active in the area.

Nevertheless, the PA faces several management challenges, including the invasion of *Prosopis*, inadequate and delayed release of funds, absence of tourism and interpretation programs, a non-functional EDC, periodic water scarcity, and insufficient engagement between management and local communities.

**Recommendations** - Recommendations include ensuring timely and adequate release of funds; establishing a scientific and systematic habitat management program; placing the draft management plan in the public domain for wider consultation; preventing the spread of *Prosopis* within the PA; regularly maintaining water channels and embankments; improving the catchment area; establishing a bird rescue center with a proper biochemistry lab at the district level; enhancing publicity, nature education, and tourism infrastructure; and engaging local communities to develop participatory livelihood improvement activities.

### **17. Nellai WLS, Tamil Nadu (2023-24):**

Nellai WLS, located in Tirunelveli district in the southern Western Ghats, covers an area of 366.73 Km<sup>2</sup> and was notified in 1992. The PA is contiguous with Grizzled Squirrel WLS to the north, Kalakad-Mundanthurai TR to the south, and Periyar TR to the west. As an important conservation unit within the Western Ghats landscape, the PA is home to approximately 55 species of mammals, 155 bird species, 16 amphibians, and 37 reptile species. Notable mammals include the elephant, Nilgiri Tahr, Nilgiri Langur, leopard, and Lion-Tailed Macaque. The difficult terrain of the PA is devoid of human settlements, and the staff strength along with physical infrastructure is considered adequate.

Nevertheless, the elongated and linear shape of the PA results in a porous boundary. Management challenges are compounded by the irregular presence of staff in the APCs within the sanctuary, erratic fund flows, insufficient ecological research and monitoring, and lack of adequate documentation.

**Recommendations** - Immediate actions needed include preparing a new management plan; ensuring timely and adequate fund flow; encouraging local scientific institutions to conduct ecological research within the PA; filling vacancies for Reserve Watchers; systematically documenting relevant management information; and improving amenities at anti-poaching

camps in the interior forest.

## 18. Oussudu Lake Bird WLS, Tamil Nadu (2023-24):

Oussadu, or Ousteri Lake Sanctuary, extends over 331.78 hectares and was notified in 2005. The sanctuary, along with the surrounding agricultural fields, grasslands, open scrub, and Kazhuveli Bird Sanctuary, constitutes a significant staging, feeding, and breeding area for numerous resident and migratory birds. Annually, about 20,000 birds, comprising 75% aquatic species including Flamingos and Pelicans, visit the sanctuary, with many rare and threatened species present. Approximately 32% of the birds, particularly geese and ducks, depend exclusively on the lake. Recognized as an IBA, the PA is well connected, free from encroachments and polluting industries, and the wetland bird populations are monitored daily.

However, despite sharing an inter-state boundary with Puducherry, the PA has not attracted significant numbers of visitors, partly due to a shortage of staff, lack of funds to develop protection infrastructure and community-centric eco-tourism, inadequacies in publicity, awareness, and outreach programs, as well as the absence of eco-development programs.

**Recommendations** - Recommendations include enhancing coordination with Puducherry forest and civil administration to improve protection and publicity for the PA; increasing staff numbers, capabilities, and amenities, including housing; improving habitats to provide sufficient perching, nesting, and feeding areas for wetland birds; enhancing staff mobility for patrolling, including the purchase of a fiberglass boat; developing eco-development programs, including eco-tourism initiatives; increasing financial support; fencing the perimeter of the PA, particularly towards Puducherry; improving ecological research and monitoring; and enhancing publicity and information signage.

## 19. Sakkarakottai Bird WLS, Tamil Nadu (2023-24)

The PA, located close to the Gulf of Mannar on the CAF, covers an area of 2.39 Km<sup>2</sup> and was notified in 2020. It is home to 116 species of birds, including approximately five Near Threatened species. The PA is easily accessible, and there are no human habitations within its boundaries.

However, the ownership of the wetland belongs to the

irrigation department, which regulates water flow in the PA. The final notification has not been issued due to unsettled rights of local people. Management suffers from a lack of dedicated administration and staff, inadequate protection and interpretation infrastructure, and financial constraints.

**Recommendations** - Immediate actions required include ensuring timely release of adequate funds; promulgating the final notification after settlement of rights; improving protection infrastructure; posting dedicated staff with necessary training; enhancing interpretation and tourism amenities and programs; properly displaying signage; and implementing participatory eco-development initiatives.

## 20. Therthangal Bird Sanctuary, Tamil Nadu (2023-24)

The PA, covering 0.29 Km<sup>2</sup>, is located close to the Gulf of Mannar on the CAF and was notified in 2010. It is home to about 48 species of birds, including approximately five Near Threatened species. The PA is devoid of human habitations within its boundaries, making it easily accessible, and local communities are generally supportive of its management.

However, the ownership of the wetland lies with the irrigation department, which regulates water flow in the PA. The final notification has not been issued due to unresolved rights of local people. The management faces several challenges, including the absence of dedicated administration and staff, a lack of basic infrastructure, the absence of a demarcated PA boundary, and financial constraints.

**Recommendations** - Immediate actions required include ensuring the timely release of adequate funds, promulgating the final notification following the settlement of rights, improving protection infrastructure, posting dedicated staff with necessary training, enhancing interpretation and tourism amenities and programs, systematically removing *Prosopis*, and establishing a gate/outpost on the road entering the PA.

## 21. Udhayamarthandapuram Bird WLS, Tamil Nadu (2023-24):

The PA, located near East Coast Road in the Tiruvarur district, extends over 45.3 hectares and was notified on 31 December 1998. This seasonal inland wetland receives water from the Mettur dam and encompasses floodplains and agricultural ecosystems, providing breeding habitats for about 40 wetland and aquatic

species, including three resident duck species. The PA accommodates between 15,000 to 45,000 birds annually and is home to 145 plant species. The northwestern part of the PA is planted with *Acacia nilotica*. The support of local villagers in the protection and management of the PA is reported to be very encouraging.

However, the PA's seasonal characteristics mean that water availability is a limiting factor. Management is challenged by a shortage of staff to handle multiple responsibilities, the absence of a formal EDC, inadequate visitor facilities, lack of publicity and interpretative infrastructure, delayed financial support, insufficient ecological research, and underutilization of educational and awareness opportunities.

**Recommendations** - Important Recommendations include increasing staff numbers and enhancing their capabilities and amenities; improving habitats through desilting and controlling the spread of woody species; strengthening protection infrastructure; establishing EDCs and improving the skills and knowledge of members for enhancing local livelihoods and protection; upgrading visitor facilities; increasing financial support, including CSR funds; enhancing ecological research and monitoring, particularly concerning climate change resilience; and improving publicity, information signage, and education and awareness programs.

## 22. Vaduvoor Bird WLS, Tamil Nadu (2023-24):

The PA, located in Tiruvarur district, is an inland wetland consisting of an irrigation tank that primarily receives water from the Mettur dam in the Cauvery Delta. This IBA, extending over 128.10 hectares, was notified in 1999. The tank attracts around 50 water bird species and 160 other bird species from October to June, and is rich in aquatic flora, featuring submerged, floating, and emergent plants, as well as trees such as *Acacia nilotica*. The PA is home to three mammal species, nine reptile species, five amphibian species, 38 fish species, and 24 butterfly species. During peak season, the number of visiting birds ranges from 20,000 to 42,000. The PA welcomes approximately 10,000 visitors annually and offers adequate facilities for visitors, along with education, awareness, and publicity programs. Local communities are generally supportive of the PA.

However, the tank is primarily intended for agricultural use, resulting in regular water release from the PA that leaves it almost dry from April to August. Management is weakened by a shortage of trained staff, eco-guides,

and field biologists, increasing siltation in the tank, lack of space to build adequate protection infrastructure, a small interpretation center, and insufficient and untimely financial support.

**Recommendations** - Recommendations include identifying and procuring vacant revenue land adjacent to the PA; increasing staff numbers, enhancing their capabilities, and improving amenities; implementing habitat improvements to provide sufficient perching, nesting, and feeding areas for wetland birds; enhancing staff mobility for patrolling, including the purchase of a fiberglass boat; developing eco-development programs, including eco-tourism; improving the interpretation center and visitor facilities; increasing financial support; enhancing ecological research and monitoring; and improving publicity and information signage.

## 23. Vedanthangal Bird WLS, Tamil Nadu (2023-24)

The PA, located 48 km inland from the Bay of Bengal in the Chengalpattu district, is one of the oldest bird sanctuaries in India. It spans an area of 73.06 acres at the irrigation tank in Vedanthangal village and includes a 5 km zone surrounding the tank. The sanctuary was originally declared during the British era, with the final notification issued in 1998. The PA supports more than 30 species of birds, with a total population of about 40,000 that feed and nest there, many utilizing the old trees of *Barringtonia acutangula*. Additionally, the PA is home to 15 species of mammals and 12 reptile species. Historically, it has been known for the mutually beneficial relationship between farmers, who benefit from manure-rich water for agriculture, and the birds, which have a herony protected by farmers. As a Ramsar site, the PA serves as an excellent center for education and recreation, attracting about 100,000 visitors annually, primarily students and bird watchers.

Despite its ecological importance, the PA is a seasonal wetland, making water availability a limiting factor. Challenges include the discharge of chemical fertilizers from upstream agricultural fields, a shortage of staff to manage multiple responsibilities, outdated visitor facilities and interpretive infrastructure, cattle grazing on non-fenced sides, inadequate and delayed financial support, and a lack of research on climate change resilience, all of which weaken management efforts.

**Recommendations** - Important Recommendations include increasing staff numbers, enhancing their capabilities and facilities (including housing) to manage various tasks and protect the buffer zone;

improving staff mobility; involving local communities in livelihood improvement activities, including eco-tourism; upgrading the interpretation center and improving interpretive materials and visitor facilities; providing exposure visits for staff to learn about zero-waste management; desilting the five feeder channels to improve water flow; exploring CSR funds for enhancing PA protection and outreach; improving publicity and awareness efforts; and ensuring timely availability of central and state funding.

#### **24. Vallanadu Blackbuck WLS, Tamil Nadu (2023-24):**

Vallanadu Blackbuck Sanctuary, extending over 16.41 Km<sup>2</sup>, is located in Thoothukudi district. It was notified in 2005 and was created specifically for the protection of Blackbucks, providing a habitat for a variety of wildlife. Blackbucks primarily congregate in the eastern open grassy areas, while the rest of the sanctuary features hilly terrain with thorny scrub vegetation. The PA is well protected, has an adequate number of staff and protection infrastructure, and is devoid of human settlements.

However, the sanctuary is isolated, with an explosives manufacturing unit located at the boundary. Additionally, several residential projects are emerging near the eastern boundary, pushing Blackbucks into hilly, scrubby areas and neighboring agricultural fields. Management challenges are compounded by financial constraints, inadequacy of vehicles and staff quarters, and the presence of feral cattle and dogs.

**Recommendations** - Immediate actions required include mitigating the threats posed by feral dogs and local cattle; creating intermittent grasslands and open patches through the systematic removal of thorny vegetation; enhancing resources for the mitigation of HWCs; ensuring timely and adequate fund flow; taking action to halt residential constructions near the eastern boundary to protect Blackbuck habitats; and initiating participatory eco-tourism and nature awareness activities.

#### **25. Vellore Bird WLS, Tamil Nadu (2023-24):**

The PA, locally known as Periyakulam Eri, encompasses 77.18 hectares and was carved out of the Erode Forest Division, being declared a sanctuary on 22 March 2000. It is recognized as one of the 10 critical breeding habitats for wetland birds in Tamil Nadu, providing a habitat for 148 bird species, with approximately 25,000 migratory birds visiting the sanctuary each year. In

addition to its rich avian diversity, the PA is home to 5 mammal species, 17 reptiles, 12 fish species, and 25 butterfly species. As a Ramsar site, it is noted for its extraordinary scenic beauty, with management support from local EDCs, other line departments, and NGOs.

Despite its ecological significance, the PA requires additional staff for effective management, which includes a butterfly park, a cafeteria, an animal rescue center, and an interpretation center. Inadequate interpretation facilities, limited eco-tourism activities, and insufficient research on the overall ecology further challenge management effectiveness.

**Recommendations** - Recommendations include increasing staff numbers, capacities, and amenities to effectively manage multiple tasks; improving protection infrastructure; enhancing the skills and knowledge of EDC members to develop suitable livelihood programs, including eco-tourism; upgrading the interpretation center, interpretive materials, and visitor facilities; organizing exposure visits for staff to learn about zero-waste management; improving publicity and awareness efforts; and ensuring timely availability of funds from the central and state government.

#### **26. Vettangudi Bird WLS, Tamil Nadu (2023-24)**

Vettangudi Bird Sanctuary, covering an area of 38.39 hectares, is located in the Sivagangai district and was notified in 1991. This wetland ecosystem comprises three interconnected ponds and is situated on the CAF, showcasing remarkable avian diversity. The PA is devoid of human settlements within its boundaries, has adequate basic infrastructure and staff, and benefits from the general support of local communities in its management.

However, the rights of local people have not been settled, which has delayed the final notification of the PA. Management challenges also include the absence of a demarcated boundary, silting of inlet water channels, blockage of water inflow due to road construction, the spread of *Prosopis juliflora*, dysfunctional EDCs, financial constraints, and a lack of ecological research and monitoring.

**Recommendations** - Immediate actions needed include the demarcation of the PA boundary on the ground; settlement of rights and expediting the issuance of the final notification; ensuring timely and adequate release of funds; systematic removal of

*Prosopis*; desilting of inlet water channels and addressing water blockage caused by road construction; maintenance of bunds and watchtowers; revitalizing

EDCs; and enhancing ecological research, monitoring, and awareness initiatives.

**Trend of MEE scores between first and repeat cycles**

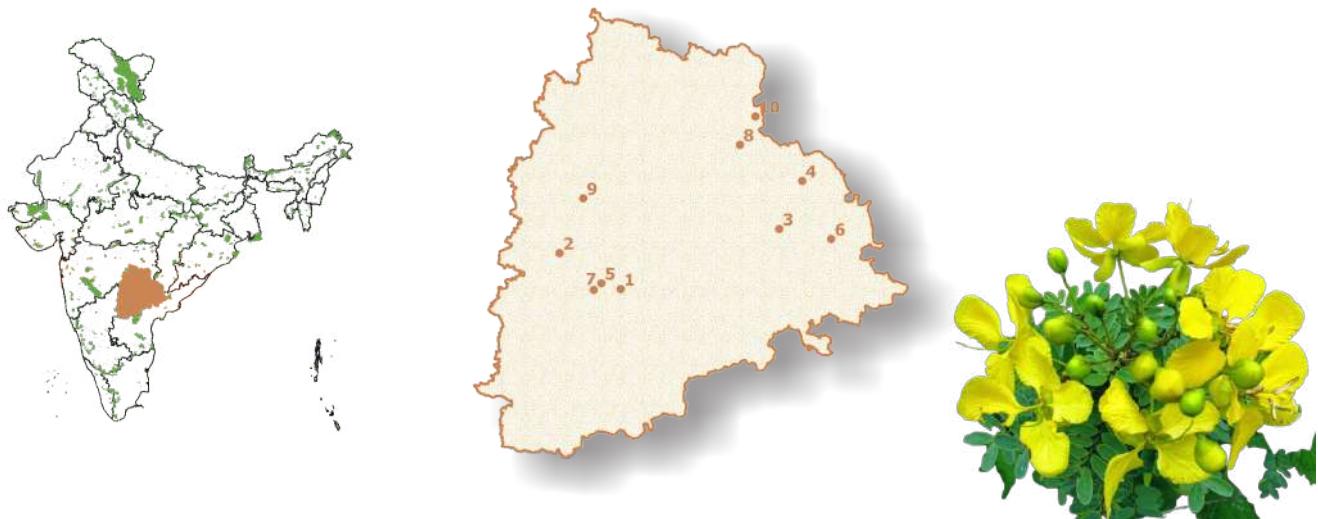
Sl. No	PAs	First Cycle			Repeat Cycle			Trend
		Phase	MEE Score (%)	Category	Evaluation Year	MEE Score (%)	Category	
1	Gulf of Mannar Marine NP	2006-2009	57.6	Fair	2018-2019	79.17	Very Good	▲
2	Kanyakumari WLS	2015-2017	77.5	Very Good	2020-2022	71.88	Good	▼
3	Mukurthi NP	2006-2009	71.2	Good	2020-2022	75	Very Good	▲
4	Point Calimere WLS	2012-2013	70.83	Good	2020-2022	62.5	Good	▼
5	Pulicat Lake Bird WLS	2015-2017	78.33	Very Good	2020-2022	63.28	Good	▼
6	Srivilliputhur Grizzled Squirrel WLS	2012-2013	64.17	Good	2020-2022	71.88	Good	▲
7	Cauvery North WLS	2017-2018	48.33	Fair	2022-2023	66.41	Good	▲
8	Chitrangudi Bird WLS	2017-2018	60	Good	2022-2023	60.94	Good	▲
9	Gangaikondan Spotted Deer WLS	2017-2018	60.83	Good	2022-2023	61.72	Good	▲
10	Guindy NP	2017-2018	65.83	Good	2022-2023	71.88	Good	▲
11	Kanjirankulam Bird WLS	2017-2018	54.31	Fair	2022-2023	60.94	Good	▲
12	Karaivetti Bird WLS	2017-2018	77.5	Very Good	2022-2023	62.5	Good	▼
13	Karikilli Bird WLS	2017-2018	52.5	Fair	2022-2023	61.72	Good	▲
14	Kodaikanal WLS	2017-2018	66.67	Good	2022-2023	65.63	Good	▼
15	Koonthankulam-Kadankulam WLS	2017-2018	75	Very Good	2022-2023	67.97	Good	▼
16	Melaselvanoor-Keelaselvanoor WLS	2017-2018	60.34	Good	2022-2023	61.72	Good	▲
17	Nellai WLS	2018-2019	72.5	Good	2023-2024	67.19	Good	▼
18	Oussudu Lake Bird WLS	2018-2019	45.83	Fair	2023-2024	60.16	Good	▲
19	Sakkarakottai Bird WLS	2018-2019	51.67	Fair	2023-2024	57.81	Fair	▲
20	Therthangal Bird WLS	2018-2019	67.5	Good	2023-2024	60.16	Good	▼
21	Udayamarthandapuram Bird WLS	2018-2019	60	Good	2023-2024	48.39	Fair	▼
22	Vaduvoor Bird WLS	2018-2019	59.17	Fair	2023-2024	57.26	Fair	▼
23	Vedanthangal Lake Bird WLS	2018-2019	61.67	Good	2023-2024	67.19	Good	▲
24	Vallanadu Blackbuck WLS	2018-2019	50.83	Fair	2023-2024	61.72	Good	▲
25	Vellode Birds WLS	2018-2019	61.67	Good	2023-2024	83.59	Very Good	▲
26	Vettangudi Birds WLS	2018-2019	61.67	Good	2023-2024	70.31	Good	▲
27	Megamalai WLS	2017-2018	56.67	Fair	-	TR	-	-
28	Mudumalai NP	2006-2009	71.2	Good	-	TR	-	-
29	Satyamangalam WLS	2009-2010	68.55	Good	-	TR	-	-



# Telangana



*Indian Roller © Rupali Thakur*



# Telangana

Telangana is located in southern India spanning over 1,12,122 Km<sup>2</sup>. The state's forest cover is 21,179.04 Km<sup>2</sup>, accounting for 18.89% of its geographic area (ISFR 2023). In the first and repeat cycle of MEE, total 10 PAs were assessed.

## 1. Mahaveer Harina Vanasthali NP, Telangana (2020-2022):

Mahaveer Harina Vanasthali NP, covering an area of 14.59 Km<sup>2</sup>, is located within Hyderabad city and its adjoining villages. It was notified in 1994 and serves as the green lung for the heavily populated urban area. The PA consists of four blocks of forests that are protected by masonry walls and well-maintained chain-link fences. Administered by the Rangareddy Forest Division, the NP predominantly features dry deciduous forests and associated wildlife. The local community is generally supportive of management efforts, and the PA is well protected without significant biotic problems.

However, the PA is fragmented, with the forest blocks being isolated, which leads to issues with inbreeding in animal populations as the fences and roads obstruct their movement. Additionally, the staff is not adequately trained in wildlife management, and there are four villages surrounding the PA.

**Recommendations** - Recommendations include increasing eco-development efforts in the four surrounding villages; developing the PA as a field

training site for the Dulapally Forest Academy, particularly focusing on the capture and release of wild animals; continuing habitat improvement activities within the PA; and encouraging local educational and research institutions to engage in research and monitoring initiatives.

## 2. Manjeera Crocodile WLS, Telangana (2020-22):

Manjeera Crocodile WLS extends over a water body spanning approximately 650 Km<sup>2</sup> between two dams, namely Singura and Manjeera, and includes a few islands. The sanctuary was notified in 1978. The Hyderabad Metro Water Works (HMWW) is the most significant stakeholder, as the PA provides drinking water to the city of Hyderabad. Annual bird counts are conducted, and Osmania University has performed several studies in the area. The population of crocodiles is reported to be stable, and a fishermen EDC has been formed. A management plan is currently in place.

However, local communities illegally draw water for irrigation and graze livestock along the creeks. Additionally, outsiders sometimes fish in the reservoirs despite the presence of the EDC. The staff and funding

are inadequate for effective management. The HMWW regulates water flow and performs maintenance activities. Crocodiles have been observed near village boundaries and at the Nizamsagar dam, which is about 100 km away, during the 2017-18 period. During lean water seasons, the dry areas are utilized by villagers for marginal agriculture. Furthermore, the water bodies are susceptible to inflows of pesticides and herbicides.

**Recommendations** - Recommendations include improving outreach and publicity to secure funding from CSR sources as well as the HMWW; strengthening and expanding the EDCs; preparing a new management plan with an ecologically sound landscape perspective that extends along the Godavari river basin; enhancing the interpretation center and engaging local youth as nature interpreters and guides; and improving research and monitoring of habitats.

### 3. Pakhal WLS, Telangana (2020-22):

The PA extends to 860 Km<sup>2</sup> and serves as the catchment for an 800-year-old Kakatiya dam. It was notified in 2008. It is part of a larger landscape, connected to RFs and another PA south of the Godavari river, and further linked to the forests of Chhattisgarh and Gadchiroli district in Maharashtra. The PA has recently reported the visitation of a tiger after a decade, and approximately 500 hectares of forest area have been freed from encroachment.

However, about 56,200 hectares of the PA remain under encroachment. The area faces challenges from incidents of left-wing extremism, illegal livestock grazing, tree felling, and poaching, along with rampant forest fires. The management is hindered by an acute shortage of staff and poor protection infrastructure. Furthermore, government subsidies for farm equipment, even for encroachers, exacerbate management difficulties.

**Recommendations** - Recommendations include constituting an inter-departmental task force to remove encroachments; improving protection infrastructure, including the posting of permanent staff; conducting studies on fragmented habitats and restoration ecology; and enhancing habitat management programs.

### 4. Eturnagaram WLS, Telangana (2022-23):

Eturnagaram WLS, covering an area of 806.15 Km<sup>2</sup>, was notified in 1978. Representing the Deccan plateau and the Godavari river systems, the PA serves as a major catchment area for the river Godavari. Predominantly characterized by dry deciduous landscapes, there are

also patches of moist deciduous forests within the PA, which are home to many endemic and rare plants. It provides habitats for several highly endangered species, including the Four-Horned Antelope, Slender Loris, Mouse Deer, Wild Dog, leopard, and occasional reports of tigers. The PA is rich in biodiversity and holds significant hydrological, cultural, religious, archaeological, geomorphological, and aesthetic values. It constitutes an important corridor along the east-west axis, connecting Bijapur forests in Chhattisgarh through Pakhala WLS and Papikondalu NP to Tadoba TR in Maharashtra. Habitat restoration work has been carried out in areas cleared of encroachments, and a well-designed interpretation center is available.

However, the PA has a history of left-wing extremism, which is reportedly declining. It contains 32 settlements of the Gottikoya tribes, contributing to heavy biotic disturbance. Challenges include livestock grazing, illegal hunting, tree felling, and unauthorized cultivation within the PA. Additionally, two popular temples attract millions of pilgrims annually. The ungulate populations are low, and an ESZ has not been notified due to issues related to sand mining along the Godavari floodplain. Protection infrastructure is inadequate, with about 50% of protection staff positions vacant. There are pockets of encroachment by local villagers, leading to conflicts related to FRA with tribal people, many of whom enter from neighboring states. Furthermore, there is inadequate political and administrative support for management efforts concerning encroachments, as well as a heavy presence and movement of security forces due to past extremism. The current management plan does not adhere to WII guidelines.

**Recommendations** - Recommendations include improving overall protection infrastructure, enhancing staff numbers, capacities, mobility, and deployment; utilizing modern technology for surveillance and protection; preparing the management plan according to WII guidelines through a consultative process involving all stakeholders; systematically implementing habitat restoration and improvement programs; actively collaborating with administrative and political entities to relocate unauthorized Gottikoya tribal settlements with attractive rehabilitation packages; engaging local institutions and NGOs to enhance PA publicity, education, awareness, research, monitoring, and eco-tourism programs; developing a plan to rewild the area with ungulates; conducting training on PA values and



overall conservation for civil society, including relevant government, judicial, and educational institutions; and establishing Forest Stations akin to Police Stations to address management challenges stemming from left-wing extremism.

## **5. Kasu Brahmananda Reddy NP, Telangana (2022-23):**

The PA, covering 142.50 hectares, is situated in Jubilee hills and Banjara hills of Hyderabad and was notified in 1998. As a representative of the Deccan plateau, the PA primarily consists of dry deciduous forests, featuring a range of ecologically significant plants and animals. It boasts comprehensive checklists of plants as well as major mammals, reptiles, birds, and butterflies. The PA is well protected by a boundary wall, and the 56 hectares designated as a Visitor Zone include well-maintained walkways, attracting approximately 300,000 visitors annually, including morning walkers, day visitors, and around 25,000 students. It serves as an

excellent city park and is a center for nature education and interpretation.

Despite these attributes, the PA faces challenges due to heavy vehicular traffic surrounding the area, resulting in air and noise pollution. The sanctuary is also an isolated patch with no ecological connectivity. Within the PA, there are two enclosures: a 2.23-hectare property of the Nizam and 3 hectares of Waqf property. The area is experiencing profuse growth of invasive weeds such as *lantana*.

**Recommendations** - Recommendations include continuing to relocate captive bred animals like Spotted Deer and Pea Fowl to nearby PAs and introducing animals from other zoos or PAs to improve genetic diversity; regulating pedestrian movement while preventing motor vehicle access within the PA; involving local nature clubs, jogging clubs, educational institutions, and NGOs in awareness creation; planting rows of dense vegetation and creating Bamboo oxygen



*Red Spur Fowl © Rajdeep Mitra*

tunnels around the PA and walkways to mitigate atmospheric pollution; improving infrastructure and amenities for visitors in the tourism zone; developing a world-class interpretation center, museum, signage, and displays within the PA; providing an electronic display about the PA at the airport to attract more visitors; leveraging local industries for CSR support; and conducting necessary research and monitoring activities.

## 6. Kinnersani WLS, Telangana (2022-23):

The PA, covering 635.4 Km<sup>2</sup>, is situated in the catchment of the Kinnersani river, a tributary of the Godavari river. It was initially notified in 1977, with the final notification published in 1999. The extensive dry deciduous forests of the PA, known as the sacred Dandakaranya, exhibit high biodiversity and significant cultural, religious, and aesthetic values, providing habitats for several endangered and threatened species of plants and animals. The PA is connected to

Eturnagaram WLS to the north, Pakal WLS to the northwest, and Papikonda NP to the southeast, creating an important Gaur-tiger landscape, although the area is highly disturbed and fragmented. A dam constructed across the Kinnersani river at the PA's fringe creates a large water body with islands, offering suitable habitat for Mugger crocodiles. The PA is home to 25 peninsular endemic plant species, including *Amorphophallus kinnerasaniensis*, which is reported to be found only in this area. An ESZ has been notified, and there is a well-designed interpretation center, with approximately 30% of the area being inviolate.

Despite its ecological importance, the PA faces challenges due to the presence of 54 villages that exert biotic pressures, including encroachments. The Gottikoya and Gond tribes illegally cultivate and graze livestock while occasionally hunting in the area. The PA has also suffered from left-wing extremism, although this is reportedly on the decline. Protection infrastructure is inadequate, with about 33% of protection staff positions vacant. Pockets of encroachment by local villagers continue, and conflicts related to FRA arise, particularly with tribal people entering the area from neighboring states. Inadequate political and administrative support hampers effective management in dealing with encroachments, and revenue officers are reportedly allotting land titles within the PA to tribal members. Additionally, tourist huts are being constructed by the tourism department around the reservoir.

**Recommendations** - Recommendations include improving overall protection infrastructure and increasing staff numbers, capacities, mobility, and deployment; utilizing modern technology for surveillance and protection; systematically implementing habitat restoration and improvement programs; actively collaborating with administrative and political entities to relocate unauthorized Gottikoya tribal settlements while providing attractive rehabilitation packages; engaging local institutions and NGOs to enhance publicity, education, awareness, research, monitoring, and eco-tourism programs; preparing a plan to rewild the area with ungulates; conducting training on PA values and overall conservation for civil society; ensuring that PA management oversees tourism activities instead of the tourism department; establishing Forest Stations modeled after Police Stations to address management difficulties arising from left-wing extremism; and taking action to discourage the allotment of land titles to tribal members within the PA.



Pheasant-tailed Jacana © Vivek Sarkar

## 7. Mrugavani NP, Telangana (2022-23):

The PA, extending over 360 hectares, is located at the southwestern edge of Hyderabad and was once a deer park. It was notified in 1998. Situated on the Deccan plateau, the area predominantly features dry deciduous and scrub vegetation, providing significant biodiversity, hydrological benefits, and values for tourism and nature education. Protected by a boundary wall, the PA acts as a green lung for the city of Hyderabad and is a popular tourist destination. It is contiguous with Chilkur RF and has established effective habitat restoration programs. The management plan is in place, and the area is divided into well-defined inviolate and tourism zones. Collaborative tourism management is conducted with the Forest Development Corporation, and visitor amenities are satisfactory.

Despite these strengths, management weaknesses are evident, including a lack of stakeholder participation in planning, a 33% vacancy rate among frontline staff, inadequate training for PA staff in wildlife management, the absence of a dedicated website, and no systematic assessment of flora and fauna.

**Recommendations** - Recommendations include filling existing staff vacancies and enhancing training and amenities for staff; establishing a rotational grazing regime to prevent excessive grazing and browsing by free-ranging Spotted Deer and Sambar; incorporating the contiguous Chilkur RF into the PA; creating innovative and interactive education and interpretation programs; improving tourism

infrastructure and services; enhancing publicity regarding the PA's role as a green lung and source of water for Hyderabad; removing invasive weeds from the inviolate zone; improving collaborative research and monitoring; leveraging support from local industrial houses for CSR initiatives; and examining the possibility of releasing captive-bred animals, currently kept in enclosures, into the PA.

## 8. Lanja Madugu Siwaram WLS, Telangana (2023-24):

The PA spreads over 29 Km<sup>2</sup> along both banks of the Godavari river in Mancherial district and was notified in 1978 to protect Mugger crocodiles. Beyond the river banks, the sanctuary extends inland, featuring dry deciduous forests dominated by Teak and *Terminalia* species. The PA is administered by two different territorial divisions, and the compact area is ecologically connected to both the north and south. The northern bank attracts visitors, and basic amenities for visitors have been created.

However, the PA is relatively small and suffers from a lack of dedicated administration. The division of management between two different territorial divisions, inadequate nature education programs, and inactive EDCs represent significant management weaknesses.

**Recommendations** - Recommendations include establishing a unified administrative structure; activating EDCs and developing a participatory eco-tourism program; providing relevant training for staff and EDC members; and implementing improved

nature education and awareness programs.

### 9. Pocharam WLS, Telangana (2023-24):

The PA, covering 130 Km<sup>2</sup>, was notified in 1952 and is located around Pocharam lake. This area, which was historically a hunting ground for the Nizams of Hyderabad, features dry deciduous forests, riverine tracts, and a mosaic of grasslands and forests along the shores of the lake. The lake itself was formed due to the construction of the Pocharam dam on the Allair river. Surrounded by water bodies on three sides, the PA hosts two large breeding enclosures for Cheetals, along with opportunities to sight various resident and migratory birds and wildlife such as leopards, making it an attractive destination for visitors. Additionally, mouse deer have been reintroduced into the area.

The PA is administered under two divisions: Medak and Kamareddy Forest Divisions. However, it is isolated and lacks significant ecological connectivity, leading to biotic pressures from surrounding villages. A few cases of HWCs have also been reported.

**Recommendations** - Recommendations include establishing a unified administrative structure; activating EDCs and developing a participatory eco-tourism program; conducting relevant training for staff and EDC members; managing HWCs effectively; and implementing improved nature education and awareness programs.

### 10. Pranahita WLS, Telangana (2023-24):

The PA, covering 136 Km<sup>2</sup>, was notified in 1980 and is situated along the banks of the Pranahita river. It features dry deciduous forests interspersed with dry scrubland and grassland along the riverbank. The focal species in the sanctuary is the Blackbuck, but it also supports a diverse range of wildlife, including 20 species of reptiles, over 50 species of birds, and 40 species of mammals. During the Naxalite period, farmlands adjacent to the river were abandoned, resulting in the development of grasslands. The PA is connected to Kawal TR to the north, where tigers were historically noted to visit. The sanctuary is supported by good protection infrastructure, with regular patrolling and camping conducted at Forest Protection Camps.

However, as the abandoned agricultural fields are now being reclaimed by farmers, conflicts with Blackbucks have increased. While the area is predominantly forested, management efforts have primarily focused on extending and developing grasslands to support Blackbuck populations.

**Recommendations** - Recommendations include developing the PA as a multi-species habitat rather than concentrating solely on Blackbucks and planning to enhance ecological connectivity with Kawal TR to better support the region's biodiversity.

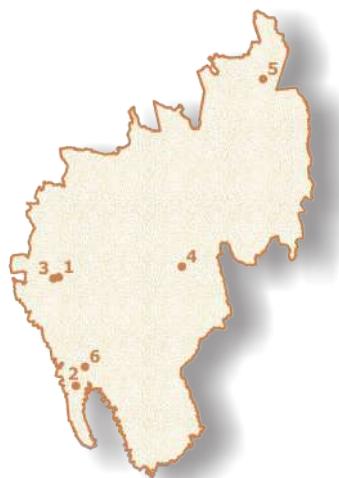
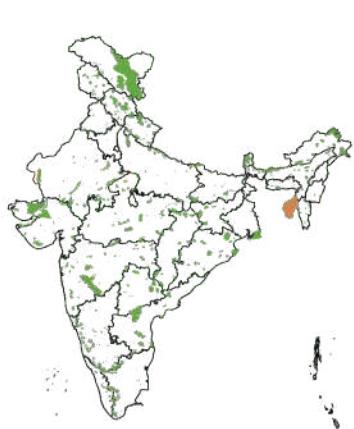
*Trend of MEE scores between first and repeat cycles*

Sl. No	PAs	First Cycle			Repeat Cycle			Trend
		Phase	MEE Score (%)	Category	Evaluation Year	MEE Score (%)	Category	
1	Mahaveer Harina Vanasthali NP	2015-2017	88.79	Very Good	2020-2022	74.19	Good	▼
2	Manjeera Crocodile WLS	2015-2017	72.5	Good	2020-2022	63.28	Good	▼
3	Pakhal WLS	2015-2017	68.1	Good	2020-2022	55.47	Fair	▼
4	Eturnagaram WLS	2017-2018	43.33	Fair	2022-2023	52.34	Fair	▲
5	Kasu Brahmananda Reddy NP	2017-2018	71.3	Good	2022-2023	76.56	Very Good	▲
6	Kinnersani WLS	2017-2018	50.83	Fair	2022-2023	65.63	Good	▲
7	Mrugavani NP	2017-2018	60.83	Good	2022-2023	71.88	Good	▲
8	Lanja Madugu Siwaram WLS	2018-2019	64.17	Good	2023-2024	72.66	Good	▲
9	Pocharam WLS	2018-2019	68.33	Good	2023-2024	76.56	Very Good	▲
10	Pranahita WLS	2018-2019	55.83	Fair	2023-2024	70.31	Good	▲



# Tripura

Stream glory © Niket Alashi



## Tripura

Tripura is in north-eastern India with the total area of 10,486 Km<sup>2</sup>. The state's forest cover is 7,584.77 Km<sup>2</sup>, accounting for 72.33% of its geographic area (ISFR 2023). In the first and repeat cycle of MEE, 6 PAs were assessed.

### 1. Sepahijala WLS and Clouded Leopard NP, Tripura (2018-19):

Sepahijala WLS and Clouded Leopard NP, located in Tripura, covers an area of 18.37 Km<sup>2</sup> and was notified in 2007. The values of the PA are well documented, and it has an approved management plan developed through a participatory process. The PA is free from significant HWC, and the staff strength is deemed adequate. Livelihood issues of the forest-fringe communities have been effectively addressed through various programs, including ecotourism, supported by sufficient tourism infrastructure.

However, the PA suffers from marginal biotic interference, inadequate implementation of management plan prescriptions, the absence of standardized methodology and periodicity in the census of key wildlife species, ad-hoc and delayed release of funds, and inadequately trained staff.

**Recommendations** - Recommendations include providing training for staff in wildlife management; standardizing methodology and periodicity for wildlife population estimation; monitoring Clouded Leopards using camera traps; establishing long-term

collaborations with research organizations for need-based studies; creating a dedicated web page for the PA and enhancing publicity efforts.

### 2. Bison (Rajbari) NP, Tripura (2022-23):

The PA, covering 31.63 Km<sup>2</sup>, was formerly designated as the core area of Trishna WLS and was notified as a WLS in 2009 to protect Gaurs, which are found only in this region of Tripura. Located in the southwestern part of Tripura, near the Bangladesh border, the PA is surrounded by Trishna WLS on all sides. It consists primarily of tropical semi-evergreen, East Himalayan lower Bhabar Sal, and moist mixed deciduous forests, featuring excellent patches of dipterocarps. Along with Trishna WLS, the PA exemplifies participatory wildlife management, with 36 EDCs assisting in various management activities, including protection and eco-tourism. Facilities for visitors include a well-designed interpretation center, a butterfly park, a botanical garden, an eco-park, and boating opportunities, which meet visitor expectations satisfactorily. The area is also a birdwatcher's paradise.

However, the PA faces management challenges, including inadequate ecological research and

monitoring, insufficient wildlife training for staff, and relatively low visitor footfall.

**Recommendations** - Recommendations include conducting ecological research and monitoring systematically; identifying flagship species and monitoring their status; coordinating with the education department to conduct regular nature education programs for schools; improving publicity and outreach to attract more visitors; and maintaining the existing management arrangement to ensure one administration oversees both the PA and the surrounding WLS.

### 3. Clouded Leopard NP, Tripura (2022-23):

The PA, notified in 2008, extends over 5.08 Km<sup>2</sup> and was once part of the core area of Sepahijala WLS, established to protect the endemic Clouded Leopard. Surrounded by Sepahijala WLS, the PA features moist deciduous forests with Bamboo brakes and evergreen riverine forests, along with a small patch of old rubber plantation. It provides habitat for several RET species, including five primate species. The PA has good staff strength and facilities, with 11 EDCs assisting management in various activities. Visitor amenities include a nature interpretation center, nature learning center, botanical garden, log huts, picnic spots, and boating facilities, in addition to a nearby biological park.

However, the PA faces management challenges such as inadequate ecological research and monitoring, insufficient wildlife training for staff, and relatively low visitor footfall.

**Recommendations** - Recommendations include conducting systematic ecological research and monitoring; identifying flagship species and monitoring their populations; coordinating with the education department to implement regular nature education programs for schools; enhancing publicity and outreach to attract more visitors; and maintaining the current administrative arrangement to ensure cohesive management of the PA and the surrounding WLS.

### 4. Gumti WLS, Tripura (2022-23):

The PA was notified in 1988 and covers an area of 389.54 Km<sup>2</sup>. Located in the south-central part of Tripura, the PA consists of moist deciduous and semi-evergreen forests, providing diverse habitats that support significant populations of various plants and animals, including many RET species. A total of 48 tree species of ethnobotanical importance have been

documented. A management plan is in place, and several EDCs assist in various management activities, including protection, mitigation of HWC, and livelihood improvement.

However, the PA faces challenges due to numerous villages surrounding it, which exert resource extraction pressures. Jhum cultivation and the conversion of forest lands to agricultural uses under the FRA have resulted in fragmentation and degradation of the forests. Additionally, public roads cut through the PA, and management suffers from shortages of staff, inadequate training, insufficient protection infrastructure, a lack of eco-tourism initiatives, and limited ecological research and monitoring activities.

**Recommendations** - Recommendations include introducing systematic habitat restoration programs; generating alternative means for local communities to reduce their dependence on the PA; developing eco-tourism infrastructure; organizing nature camps for schools; and systematically undertaking ecological research and monitoring.

### 5. Rowa WLS, Tripura (2022-23):

The PA, covering 86 hectares, is located in the north Tripura district and was notified in 1988. The majority of the PA is well wooded, exhibiting rich biodiversity, including some highly endangered species such as Phayre's Leaf Monkey. The area also features good bird diversity. Proximity to Dharmanagar, the second-largest town in Tripura, ensures that the PA is well connected by road.

However, the PA faces several management challenges, including a shortage of frontline staff and inadequate training in wildlife management. There is an absence of systematic research and monitoring, as well as insufficient maintenance of areas designated for tourism, which further weaken management efforts.

**Recommendations** - Recommendations include updating the management plan; organizing wildlife training programs for staff; conducting regular ecological research and monitoring as part of management activities; and identifying flagship species to monitor their status effectively.

### 6. Trishna WLS, Tripura (2022-23):

The PA, extending to 194.7 Km<sup>2</sup>, is situated in southwestern Tripura, close to Bangladesh, and was notified in 1988. Following the notification of the core area as Rajbari or Bison NP in 2009, the current extent of the PA is approximately 163 Km<sup>2</sup>. Both the PA and the NP are managed under one administration. The area



features moist deciduous, semi-evergreen, and Bhabar Sal forests, interspersed with grasslands and wetlands, contributing to its rich wildlife, which includes six species of primates, numerous small mammals, lower-order fauna, and various birds. It is the only location in Tripura where Gaurs are found. The PA exemplifies participatory wildlife management with 36 EDCs assisting in various management activities. Facilities include an interpretation center, a butterfly park, a botanical garden, log huts, and boating facilities.

Despite these strengths, the PA faces management weaknesses such as inadequate ecological research and monitoring, insufficient wildlife training for staff, and relatively low visitor footfall.

**Recommendations-** Recommendations include conducting systematic ecological research and monitoring; identifying flagship species and monitoring their status; coordinating with the education department to carry out regular nature education programs for schools; improving publicity and outreach to attract more visitors; and maintaining the current arrangement of a unified administration for both the PA and the NP.



**Trend of MEE scores between first and repeat cycles**

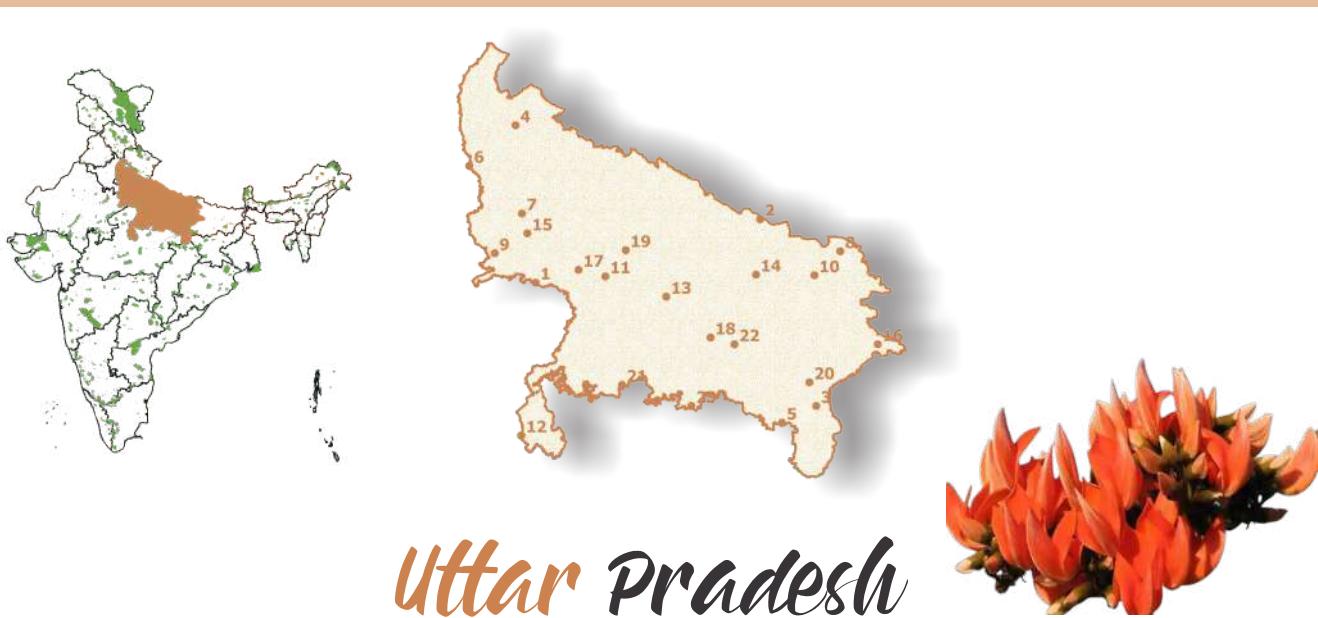
Sl. No	PAs	First Cycle			Repeat Cycle			Trend
		Phase	MEE Score (%)	Category	Evaluation Year	MEE Score (%)	Category	
1	Sepahijala WLS & Clouded Leopard NP	2006-2009	65.9	Good	2018-2019	74.1	Good	▲
2	Bison (Rajbari) NP	2012-2013	56.67	Fair	2022-2023	74.22	Good	▲
3	Clouded Leopard NP	2012-2013	55.83	Fair	2022-2023	76.56	Very Good	▲
4	Gumti WLS	2006-2009	56.8	Fair	2022-2023	58.06	Fair	▲
5	Rowa WLS	2015-2017	56.67	Fair	2022-2023	63.28	Good	▲
6	Trishna WLS	2009-2010	56.06	Fair	2022-2023	73.44	Good	▲



# Uttar Pradesh

Little Grebe © Vivek Sankar





Uttar Pradesh is located in northern India, with a total area of 240,928 Km<sup>2</sup>. The state's forest cover is 15,045.80 Km<sup>2</sup>, accounting for 6.24% of its geographic area (ISFR 2023). In the first cycle of MEE, a total of 22 PAs are assessed. In the repeat cycle, 21 PAs are assessed, and 1 PA is excluded, as it was previously evaluated in the first cycle but now falls under a TR, which undergoes a separate MEE process.

## 1. National Chambal WLS, Uttar Pradesh (2018-19):

Chambal WLS, covering an area of approximately 405 Km<sup>2</sup>, was notified in 1983. The PA supports the largest population of Gharials in the country, along with healthy populations of Gangetic Dolphins, Mugger crocodiles, eight species of turtles, otters, and about 300 species of migratory and resident birds. The PA is well connected by roads, and there is low biotic interference in the river. It features an interpretation center and boating facilities for tourists, and many homestays have developed around the sanctuary for visitors.

However, the sanctuary faces several management weaknesses, including the absence of scientific monitoring of flagship and keystone species, a lack of staff trained in wildlife management, a 50% vacancy rate among staff, heavy grazing by domestic livestock along the riverbanks, trampling of nesting sites, illegal sand mining, and insufficient publicity.

**Recommendations** - Recommendations include regular scientific monitoring of flagship and keystone species, including their populations, egg-laying sites, and the number of eggs laid annually by flagship

reptiles and migratory birds; improving publicity and interpretation programs; establishing linkages with academic and research institutions for biodiversity inventory and ecological and socio-economic surveys; systematically documenting field observations; training local youth to undertake eco-tourism and nature education; and securing improved funding for management efforts.

## 2. Sohelwa WLS, Uttar Pradesh (2018-19):

The PA, notified in 1988, spans 452 Km<sup>2</sup> across three districts in eastern Uttar Pradesh, with an additional buffer forest of 230 Km<sup>2</sup>. It represents the typical Bhabar-Terai ecosystem, with Sal trees as the dominant species. The PA forms a green strip approximately 5 km wide along the Indo-Nepal border and provides ideal habitats for a variety of birds across its 12 wetlands. The PA has well-demarcated boundaries and boasts good management and protection infrastructure, with convenient access to the district headquarters in Balrampur. An approved management plan is in place.

Despite these strengths, the PA faces significant challenges, including heavy biotic pressure, particularly on the Indian side, from uncontrolled cattle grazing, illegal fuel collection, and illicit tree felling.

There is an acute staff shortage, with about 50% of positions vacant, along with poor communication and mobility. Inadequate training, control of certain water bodies by the irrigation department, lack of coordinated planning between the PA and the buffer area, absence of EDCs, and insufficient cooperation from local communities further weaken management efforts.

**Recommendations** - Recommendations include preparing an inventory of the flora and fauna in collaboration with local academic and research institutions; involving NGOs in PA management; improving awareness and publicity efforts; and restoring the wireless network for better communication.

### 3. Chandraprabha WLS, Uttar Pradesh (2020-22):

The PA, covering 96 Km<sup>2</sup>, was initially notified in 1957 as a hunting reserve of the erstwhile Banaras state. It is part of the Wildlife Division Kashi and is buffered by other forests that encompass approximately 600 Km<sup>2</sup>. The PA serves as the catchment area for the Chandrabhaga river and features several waterfalls. A management plan is in place, and various water-holding structures help retain water throughout the year. The PA is well connected to major towns and possesses high historical, cultural, and religious values, in addition to rich biodiversity. An interpretation center with audio-visual display facilities is currently under construction, and the PA has good tourism infrastructure. It is known for its Sloth Bear population and also supports various vulture species.

However, the PA faces several management challenges, including poorly surveyed and demarcated boundaries, heavy biotic pressure from neighboring villages, and the defunct status of Joint Forest Management Committees (JFMCs) following the completion of the JICA Project. A state highway runs through the PA, where recent incidents have resulted in the deaths of two Sloth Bears. Moreover, there is a significant shortage of staff due to high vacancies, and the existing staff lack training in wildlife management. Additionally, there is inadequate information regarding the PA.

**Recommendations** - Recommendations include improving staff numbers and capacities, particularly for managing conflict animals; reactivating the defunct JFMCs to enhance participatory management; identifying animal corridors and establishing speed restrictions on vehicles passing through the PA;

introducing night restrictions on vehicle movement; enhancing visitor facilities, interpretative avenues, and displays; enlisting support from local NGOs and institutions to improve research and monitoring programs; and inoculating livestock in neighboring villages.

### 4. Hastinapur WLS, Uttar Pradesh (2020-2022):

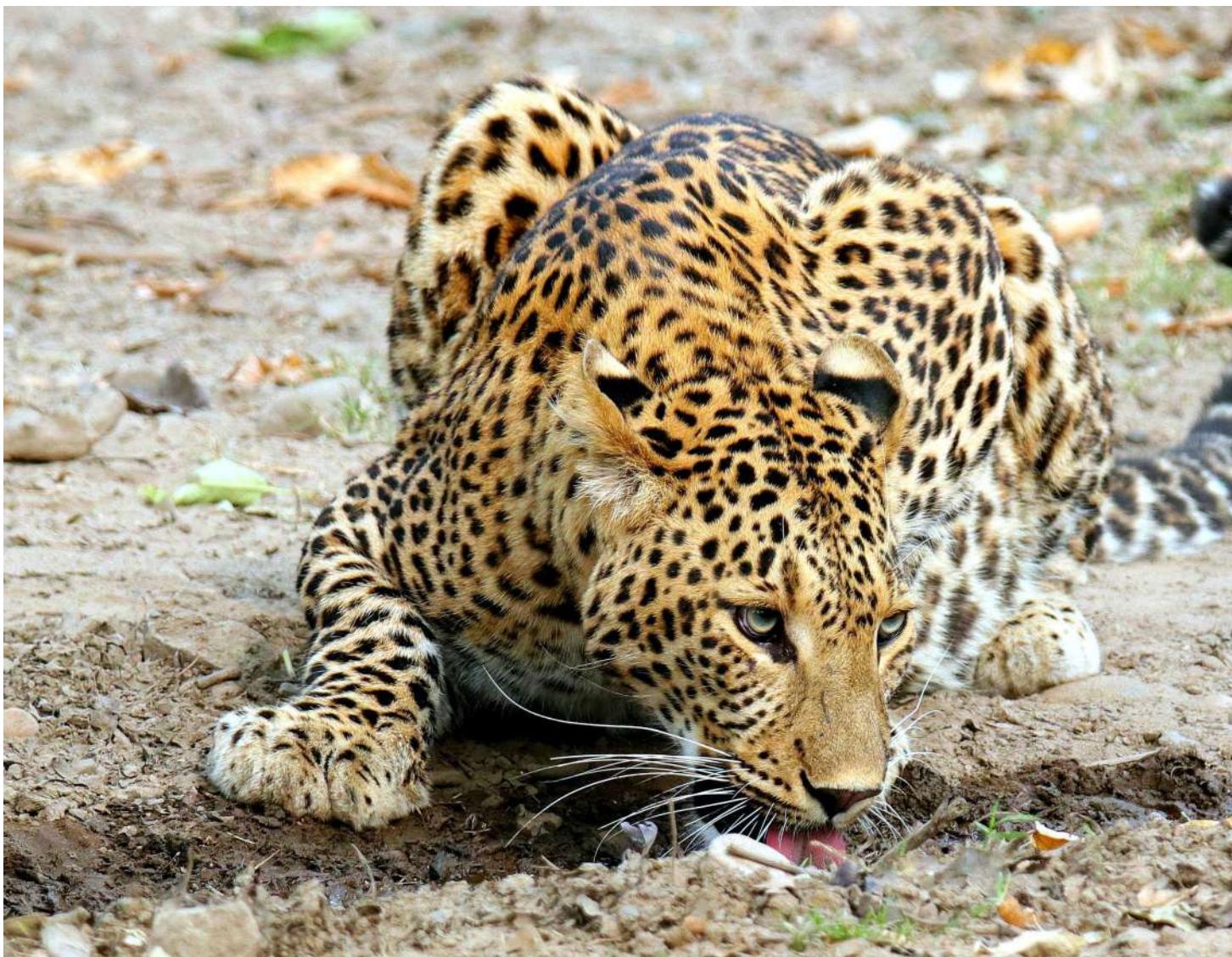
The PA, extending over 2,073 Km<sup>2</sup>, was notified in 1986 with a focus on the protection of the Gangetic Dolphin and Swamp Deer. It encompasses water bodies, swampy wetlands, and forests that support a rich assemblage of flora and fauna typical of the Gangetic plain. The upstream Bijnor barrage provides important habitats for several resident and migratory birds. Following the direction of the National Green Tribunal (NGT), the area of the PA has been rationalized to 1,020 Km<sup>2</sup>. A participatory turtle conservation program, involving 487 families across seven districts, has successfully reared and released 3,400 individuals of three species of turtles. Visitor facilities are available near Bijnor barrage, and an interpretation center exists at Hastinapur. However, the management plan expired in 2012, and a draft management plan is awaiting approval from the competent authority.

The PA suffers from significant biotic pressure from several villages within its boundaries, along with issues such as illegal poaching of deer and turtles, tree felling, grass cutting, NTFP collection, and fishing. Human-leopard conflicts are common, as are crop raiding incidents involving Nilgais and deer. Other than the turtle conservation program, local communities have limited involvement in PA management, with inadequate staff numbers, mobility, and facilities.

**Recommendations** - Recommendations include establishing a single administration for the PA; proposing a Dolphin Conservation Reserve along stretches with suitable dolphin habitat and population; improving protection infrastructure; filling staff vacancies and enhancing their capacities and facilities; improving outreach and participatory programs; and enhancing research and monitoring programs, particularly for water quality.

### 5. Kaimur WLS, Uttar Pradesh (2020-2022):

Kaimur WLS, located in Uttar Pradesh, covers an area of 1,325.53 Km<sup>2</sup> and was notified in 1989. The PA spans two districts and is managed by the Wildlife Division of Mirzapur. While the Salkhan Fossil Park abuts the PA, it is not a notified part of the sanctuary. The PA supports



several endangered and threatened species of plants and animals and holds significant hydrological, cultural, and aesthetic values. Blackbuck is considered the mascot of the sanctuary, with a stable population. The area is also famous for the Lakhaniya rock paintings. An approved management plan is in place, and the sanctuary attracts many tourists to its waterfalls, rock paintings, and the neighboring fossil park. Villagers are actively engaged in plantation and other departmental works, and park staff are competent in handling stray crocodiles. Feedback from visitors is obtained regularly.

However, the PA faces challenges, including 35 villages within its boundaries and about 100 surrounding it, exerting heavy biotic pressure on the sanctuary. Issues include poor protection infrastructure, insufficient staff numbers, inadequate mobility and capacities, a deficiency of tranquilizing equipment, inadequate participation from villagers, NGOs, and local institutions, and poor coordination with neighboring Madhya Pradesh forest divisions. Additionally,

boundary demarcation has been found to be incorrect, and interpretative and visitor facilities are inadequate.

**Recommendations** - Recommendations include properly surveying the boundaries and consolidating them; improving staff numbers, training, and facilities; enhancing inter-state coordination with Madhya Pradesh forest personnel; engaging local NGOs and institutions for research, monitoring, and outreach efforts; resolving the issue of having 'one drawing disbursing officer' per district; including the fossil park within the PA; upgrading visitor facilities and meticulously maintaining tourist spots; and developing eco-tourism programs with local communities that include proper arrangements for benefit sharing.

## **6. Okhla Bird WLS, Uttar Pradesh (2020-22):**

The PA, covering 400 hectares, is part of the National



Leopard © Vivek Sarkar

Capital Region and was notified in 2010. It is located upstream of the Okhla barrage and is under the ownership of the irrigation department of the Government of Uttar Pradesh. An ESZ notification was issued in 2015, and the PA falls under Category 4 of IUCN. The boundaries of the PA are properly surveyed and fenced, and it experiences a high footfall of tourists from nearby towns and cities. Facilities for visitors are good, including interpretation resources, a field guide on birds, and brochures. There is effective inter-departmental and inter-state coordination, and the PA has no villages inside it, with a WhatsApp group of birdwatchers enhancing community engagement.

Nevertheless, the PA faces several challenges. The land ownership does not rest with the FD, leading to heavy grazing pressure on the periphery. The sanctuary is under dual control and experiences an acute shortage of staff, with inadequate accommodation for personnel. Additionally, inadequately treated wastewater inflow from the Delhi side pollutes the

reservoir, and there is a proliferation of invasive plant species.

**Recommendations** - Recommendations include approving the draft management plan; filling staff vacancies and improving their capacities and facilities; undertaking a systematic weed removal and habitat improvement program; addressing water pollution from untreated sewage discharge upstream from the Delhi side; stopping grazing within the PA; and introducing systematic research and monitoring programs, particularly for water quality monitoring.

### 7. Shekha Bird WLS, Uttar Pradesh (2020-22):

The PA, covering 40.3 hectares, was notified in 2016 and is located close to Aligarh airport on NH 2, situated in the CAF for migrating birds. This rainfed wetland receives supplementary water from the Upper Ganga canal as needed. The compact area is home to Blackbucks and Spotted Deer, along with several resident and migratory bird species. It experiences a high tourist footfall and offers good facilities for visitors, receiving strong support from local NGOs and educational institutions. Funding support for the PA is satisfactory.

Although an ESZ has been proposed, the PA currently lacks an approved management plan. It faces several management challenges, including the absence of dedicated PA staff, with personnel deputed from the territorial division lacking training in wildlife management. Additional issues include inadequate staff housing and equipment, livestock grazing in one section, lack of public participation, and the proliferation of invasive species.

**Recommendations** - Recommendations include obtaining an approved management plan as soon as possible; appointing exclusive staff for the PA and providing them with appropriate training, housing, and equipment; stopping livestock grazing within the PA; introducing a systematic habitat improvement program, particularly for invasive species management; developing a participatory eco-tourism program and upgrading the existing interpretation center and displays; and creating participatory programs that involve villagers who depend on PA resources.

### 8. Sohagbarwa WLS, Uttar Pradesh (2020-22):

The PA, representing the Upper Gangetic Plain, covers an area of 428 Km<sup>2</sup> and was notified in 1987. It is one of



Bar-headed Goose © Rajdeep Mitra

the few remaining moist tropical Sal and cane forests in the Terai region and was carved out of the Gorakhpur Forest Division. The PA maintains connectivity with forests in Nepal to the north and Valmiki TR to the east. Drained by the Gandak river and its tributaries, the PA holds important aquatic fauna. The mix of grasslands (13%) and wetlands (33%) interspersed within moist Sal forests provides diverse habitats for many endangered and threatened animal and plant species, with tigers occasionally visiting from Valmiki TR. An ESZ was notified in 2017, and the area benefits from good support from NGOs.

Despite these strengths, several villages are located within the PA, many of which are revenue villages that have settled their rights under FRA, leading to severe biotic pressures. Over 13 Km<sup>2</sup> of the PA is under encroachment, and a number of public roads crisscross the area. Protection infrastructure, including buildings, vehicles, arms, and equipment, is very poor. The PA suffers from a staff shortage and inadequate training in wildlife management. JFMCs are defunct, and there are no visitor facilities or interpretation programs.

**Recommendations** - Recommendations include strengthening overall protection infrastructure; filling existing staff vacancies and enhancing their capacities and facilities; reviving JFMCs and developing participatory livelihood improvement programs, including eco-tourism; improving visitor facilities and interpretation programs; enhancing funding support; engaging NGOs and local institutions to create baseline information on important aquatic and terrestrial wildlife; and improving research and

monitoring activities.

## 9. Sur Sarovar Bird WLS, Uttar Pradesh (2020-22):

Soordas WLS, also known as Keetham lake, encompasses an area of 403 hectares and was notified in 1991. Located approximately 20 Km from the city of Agra along the Agra-Mathura Highway, the PA receives water from the Yamuna river through a canal originating from the Okhla barrage and supplies water to the Mathura refinery. An ESZ was notified in 2019. The PA is a birdwatcher's paradise, attracting about 25,000 migratory birds during the winter, and features heronries where resident birds breed. The area is compact and free from human habitation, with high tourist footfall and good visitor facilities, including boating options. Additionally, a bear rescue center located near the PA serves as an added attraction for visitors. A management plan is currently in place.

However, the PA is awaiting the issuance of its final notification. It houses a school for visually challenged individuals, whose lease has expired, along with a few long-term leases for the Mathura refinery and the horticulture department. Some encroachments have been reported in the peripheral area. The PA faces challenges due to a shortage of staff, inadequate training for existing personnel, lack of participatory programs, absence of an interpretation center, and instances of illegal fishing.

**Recommendations** - Recommendations include appointing sufficient staff and providing training in wildlife management; engaging local communities in

PA protection and livelihood improvement activities, including eco-tourism with revenue-sharing arrangements; constituting a local advisory committee; improving interpretation facilities, including constructing an interpretation center; utilizing e-rickshaws or polo carts for tourist movement within the PA; and collaborating with scientific institutions and NGOs for outreach functions and creating a scientific baseline.

### **10. Bakhira WLS, Uttar Pradesh (2022-23):**

The PA, covering 2,894.452 hectares, is the largest freshwater body in Uttar Pradesh and was notified in 1990. It was declared a Ramsar site in 2021. Predominantly flat land, the PA attracts approximately 40,000 birds annually for wintering, and is especially known for its large congregation of sarus cranes. It meets the criteria for an IBA under criteria A1 (Threatened species) and A4iii (more than 20,000 water birds) as per Birdlife International. The PA plays a crucial role in controlling the hydrology and ecology of the region, and local communities regard it as a potential source of livelihood. An approved management plan is in place.

However, the area does not belong to the FD, which hinders effective control. The PA is surrounded by 103 peripheral villages, and there have been reports of bird poaching and illegal fishing. Management challenges include inadequate protection infrastructure, acute staff shortages, high vacancy rates, and insufficient training for personnel. Additional problems comprise pesticide-laden discharges from agricultural fields, eutrophication from algae, presence of Water Hyacinth, poor tourism facilities, budget constraints, weak participatory management, inadequate publicity and interpretation programs, and a lack of inter-sectoral coordination.

**Recommendations** - Recommendations include exploring the possibility of notifying private areas as community reserves to improve participatory control over the WLS; enhancing protection infrastructure to enforce WLPA to prevent poaching, illegal fishing, and the reclamation of water bodies; increasing staff strength and providing necessary training; activating EDCs and collaborating with them for livelihood improvement, such as eco-tourism and PA protection; upgrading the existing interpretation center; and improving research and monitoring efforts.

### **11. Lakh Bahosi Bird WLS, Uttar Pradesh (2022-23):**

Lakh Bahosi Bird WLS, covering an area of 80 Km<sup>2</sup>, was

notified in 1991. The sanctuary comprises two natural shallow lakes, creating a wetland rich in aquatic vegetation and diverse fish populations, which contribute to the trophic structure of a functional wetland ecosystem. It has been identified as an IBA under criterion A1 (Threatened species), hosting 125 bird species from 36 families and serving as part of the CAF. The neighboring communities generally do not have serious conflicts with management, and the PA benefits from good protection infrastructure. Water is supplied to the sanctuary from the Ganga canal, and there is an approved management plan in place. Certain areas of the PA are fenced with chain-link fencing, and previous MEE recommendations have been only partially implemented.

However, the sanctuary is situated within an agricultural landscape surrounded by five villages that have unresolved rights issues. The PA suffers from challenges including chemical-laden inflows from agricultural lands, the spread of aquatic and terrestrial invasive species, a declining trend in migratory birds, a lack of inter-sectoral coordination, inadequate engagement with research institutions, and defunct EDCs.

**Recommendations** - Recommendations include reviving the EDCs through eco-tourism with a proper revenue-sharing arrangement; proposing the area as a Ramsar site; leveraging local industries for CSR funds; systematically removing invasive species; developing a lake restoration plan and preventing polluted inflows from agricultural lands; settling the rights of local people and properly demarcating the PA boundary; improving the existing interpretation center, visitor facilities, and nature education programs; and organizing relevant training for staff.

### **12. Mahavir Swami WLS, Uttar Pradesh (2022-23):**

Mahavir Swami WLS, covering an area of 12.4 Km<sup>2</sup>, is situated on a plateau over the Betwa river and represents the dry Teak and mixed deciduous forests of the Vindhyan hills in the Bundelkhand region. It was notified in 2007. The PA serves to protect the flora and fauna of the region, with its cliffs providing an ideal habitat for Long-billed Vultures. Additionally, there are 41 globally renowned Jain temples within the PA. A management plan is in place, but most of the recommendations from previous MEE have not been followed.

There are four villages located within the sanctuary, contributing to associated biotic disturbances. EDCs are currently non-functional, and invasive species such

as *Lantana* and *Cassia tora* have overtaken grassy open areas, which negatively impacts tree regeneration. The DFO operates from a distant location, leading to challenges such as inadequately trained staff, insufficient staff accommodation, poor protection infrastructure, inadequate visitor facilities, and funding constraints.

**Recommendations** - Recommendations include reviving EDCs and developing participatory livelihood improvement programs, including temple tourism with proper revenue-sharing arrangements; implementing a systematic habitat restoration plan; improving the interpretation center; including the PA in Lalitpur Division; enhancing staff numbers, capacities, and facilities; upgrading tourism infrastructure; and facilitating vulture feeding within the PA.

### 13. Nawabganj Bird WLS, Uttar Pradesh (2022-23):

Nawabganj Bird WLS, covering an area of 2.25 Km<sup>2</sup>, is located in Unnao district and was notified in 2004. It is recognized as an IBA and a Ramsar site, serving as a passage along the CAF. This natural perennial, shallow wetland receives water from the Sharda canal, which helps maintain its perennial character, supporting 124 species of resident and migratory birds, along with a rich diversity of aquatic vegetation and fauna. The sanctuary is also known as Shaheed Chanda Shekhar Bird Sanctuary. It features well-marked trails used for bird watching, has a management plan in place, and possesses good physical infrastructure, including a functional website. Approximately 4.4 km of the PA's periphery is fenced, and previous MEE recommendations have been only partially complied with.

However, some villagers retain resource use rights within the PA, and the colonization of the water body by aquatic plants such as *Nelumbo nucifera* has led to habitat loss for many specialized bird species, including divers. Additionally, fragmentation of the PA, growth of invasive species, absence of wildlife-trained staff, the presence of feral cattle, inadequate cross-sectoral coordination, and the lack of EDCs present further management challenges.

**Recommendations** - Recommendations include reviving EDCs and establishing livelihood generation programs with proper revenue-sharing arrangements; implementing a systematic program for the removal of invasive species, including replacing *Prosopis* with wider-canopied trees like *Barringtonia asiatica*; leveraging local industries for CSR support; stabilizing slopes of the trails using vetiver grass; developing

suitable trails without concreting; enhancing outreach and nature education programs, including upgrading the interpretation center; improving staff numbers and training; increasing engagement with multiple stakeholders; completing the fencing of the remaining boundary; and bringing the deer park, FRH, and adjoining areas under the PA's administrative control.

### 14. Parvati Aranga WLS, Uttar Pradesh (2022-23):

The PA consists of two water bodies and is spread over the lands of eight villages. It was initially notified in 1990 over an area of 1,084.47 hectares, which was subsequently reduced to 693.82 hectares after the settlement of villagers' rights and transfer to the FD. A one-kilometer-wide ESZ around the PA was notified in 2017. As part of the CAF and designated as a Ramsar site, the PA attracts over 100,000 resident and migratory birds. It plays a crucial role in maintaining the hydrology and ecology of the area, supporting the culture and economy of the local population. A well-visited temple is located next to the PA, with the town of Ayodhya nearby. The PA has good physical infrastructure.

However, the PA faces several management challenges, including illegal grazing and fishing activities, the absence of EDCs, a lack of dialogue with multiple stakeholders, acute staff shortages, inadequate training for staff, poor protection infrastructure, insufficient tourism facilities, funding constraints, and a pending final notification of the PA.

**Recommendations** - Recommendations include improving participatory management by establishing EDCs; enhancing protection infrastructure at Parvati lake; increasing staff numbers and improving their capacities and facilities; fencing the boundary of the PA to strengthen protection; upgrading interpretative signages, nature education programs, and the interpretation center; improving visitor facilities; and issuing the final notification of the PA.

### 15. Patna WLS, Uttar Pradesh (2022-23):

The PA is a natural shallow freshwater lake extending over 108.86 hectares and was notified in 1990. Surrounded by agricultural lands and having permanent water, the PA attracts a large number of resident and migratory birds, providing significant hydrological and ecological values. Located along the Aligarh-Agra Highway, the PA has good potential for development into a nature education and recreation center. Local villagers are very supportive of the PA and hold a historically important religious site within its

boundaries in high regard. The perimeter of the PA is mostly fenced.

However, as the PA is constituted of village lands and does not have final settlement, it experiences livestock grazing and movement of people. Rainfall influences the water levels in the PA, leading to fluctuations in inundation levels. Additionally, challenges such as staff shortages, inadequate protection infrastructure, funding constraints, the predominance of *Prosopis* over earthen mounds, and inadequate interpretation facilities hinder effective management.

**Recommendations** - Recommendations include obtaining the final notification of the PA; replacing *Prosopis* with fruit-bearing plants; improving funding supplies with timely releases; increasing staff strength; creating a dedicated website and enhancing outreach and educational functions of the PA; exploring steady and regular water supply to the PA; establishing village eco-development programs with revenue-sharing arrangements; improving coordination with multiple stakeholders; and completing the fencing of the remaining boundary.

## 16. Jai Prakash Narayan (Surhatal) Bird WLS, Uttar Pradesh (2023-24):

The PA, covering 3,432.93 hectares, was notified in 1991 and is situated close to the town of Balia. It consists of 3,300.15 hectares of private land, with the remainder being Gram Samaj land. The PA is administered by the RO of the Turtle Rehabilitation Centre, Sarnath, under the Kashi Wildlife Division, and is connected to the river Ganga. An approved management plan is in place.

However, the private lands within the PA are regularly utilized by local villagers from 44 surrounding villages. Additionally, the community land of the Gram Samaj has not been delineated. The Division and range headquarters are located far from the PA, which has led to staff demotivation. Management challenges include a lack of developmental funds, absence of trained staff, and insufficient baseline data.

**Recommendations** - Recommendations include urgently settling the rights of local villagers and properly demarcating the PA boundaries; establishing the PA Range Office at Balia; preparing contour maps for the area and establishing a baseline inventory of PA values; developing a comprehensive ecological restoration plan; improving management of Kathal Nallah, which links the PA with the river Ganga to ensure a perennial supply of water; and enhancing the skills and knowledge of the staff.

## 17. Saman Bird WLS, Uttar Pradesh (2023-24):

Saman Bird WLS, covering approximately 7.54 Km<sup>2</sup> (or 754 hectares), consists of 15-16 shallow water bodies that create a large water sheet. It was notified in 2006. The shallow water, along with its aquatic vegetation, insects, and fish populations, supports large numbers of migratory and resident birds, including the state bird, the Sarus Crane. The PA has an approved management plan, is easily accessible, and conducts periodic bird counts.

However, the boundaries of the PA are not demarcated, and more than 50% of the area lies on private farmlands, leading to significant water stress and biotic pressures. The water bodies are disconnected, and the lack of a forested catchment makes water availability erratic. Additionally, the staff is inadequately trained in wildlife management.

**Recommendations** - Recommendations include preparing a detailed contour map with clearly demarcated boundaries; developing a comprehensive ecological restoration plan; restoring the two nallahs to improve water availability; settling the rights of local farmers; ensuring timely availability of funds; conducting periodic monitoring of water quality; providing appropriate training to staff; and implementing research, monitoring, and education programs.

## 18. Samaspur Bird WLS, Uttar Pradesh (2023-24):

Samaspur Bird Sanctuary, covering an area of approximately 14.09 Km<sup>2</sup> and notified in 1991, came into existence following the construction of the Sharda canal, which inundated the surrounding revenue lands and began attracting large numbers of migratory and resident birds. The PA is categorized as an IBA and is recognized as a Ramsar site. It has an approved management plan and conducts periodic bird counts, with staff members stationed close to the sanctuary.

However, the PA lacks a proper contour map, and its boundaries have not been delineated. The water body varies in depth, being too deep in some areas while others remain shallow, where farmers continue to cultivate paddy. Additionally, there is a high occurrence of *Eichhornia*, and the staff is inadequately trained in wildlife management.

**Recommendations** - Recommendations include preparing a detailed contour map with clearly demarcated boundaries; settling the rights of the

villagers and discouraging them from cultivating inside the PA; restoring the Bakuli drain; ensuring timely availability of funds; conducting periodic monitoring of water quality; providing appropriate training for the staff; and implementing research, monitoring, and awareness programs.

### **19. Sandi Bird WLS, Uttar Pradesh (2023-24):**

Sandi Bird Sanctuary consists of a natural depression along with the revenue land from nearby villages, such as Adampur and Mirzapur. The notified area covers approximately 25.69 Km<sup>2</sup> and was notified in 1990. It features a mosaic of wetlands that attract several migratory and resident birds. An approved management plan is in place, and staff members are stationed close to the PA, which is easily accessible from the district headquarters.

However, the PA lacks a proper contour map, and its boundaries have not been delineated. The majority of the water body has been observed to be eutrophic, with a high occurrence of *Eichhornia*. Some parts of the PA remain under the ownership of local villagers, and the staff is inadequately trained in wildlife management.

**Recommendations** - Recommendations include preparing a detailed contour map with clearly demarcated boundaries; developing a comprehensive ecological restoration plan; lifting water from the Garra river; constructing a channel to bring water from the Sharda canal to the PA; settling the rights of local farmers; ensuring timely availability of funds; conducting periodic monitoring of water quality; providing appropriate training for staff; and implementing research, monitoring, and awareness programs.

### **20. Turtle WLS, Uttar Pradesh (2023-24):**

Turtle WLS, covering an area of 30 Km<sup>2</sup>, was notified in 2021 and is situated on either bank of the river Ganga in Prayagraj district. The sanctuary has the potential to support many migratory and resident bird species, as well as the South Asian Dolphin. One bank features a highly eroded levee, while the opposite bank is relatively flat, characterized by stone pitching on the eroded levee and agricultural fields on the flat bank.

However, the sanctuary lacks contour maps, and its boundaries are not demarcated. The riverbanks are subjected to various forms of human use, which diminishes the congenial wildlife environment, and the area is frequented by stray dogs as well as used for disposing of animal carcasses. There is currently no

dedicated staff available, and the river channel is also utilized by fishermen.

**Recommendations** - Recommendations include establishing a dedicated PA administrative unit and the corresponding infrastructure; mapping and demarcating the sanctuary boundaries; providing adequate funding; identifying turtle nesting sites and ensuring their protection; settling the use rights of various stakeholders; initiating an ecological baseline inventory; and using the area for environmental awareness initiatives.

### **21. Vijai Sagar WLS, Uttar Pradesh (2023-24):**

Vijay Sagar WLS, covering an area of approximately 334.87 hectares, was notified in 2007. This large water body is surrounded on three sides by forests and an ancient fort, and it is well connected to the Mahoba district headquarters. Vijay Sagar features good infrastructure, providing excellent opportunities for eco-tourism. The lake attracts various resident and migratory birds, and the PA has an approved management plan in place.

However, the PA faces several management challenges, including the absence of contour maps and proper boundary demarcation. A significant portion of the PA remains privately owned, and the rights of local people have not been settled. Additionally, as the catchment predominantly consists of agricultural lands, the lake suffers from a heavy load of organic matter. Staff members are not adequately trained in wildlife management.

**Recommendations** - Recommendations include preparing a contour map and delineating the PA boundaries; urgently settling the rights of local people; developing a comprehensive eco-restoration plan; collaborating with local institutions to create a baseline inventory and conduct ecological research and monitoring; regulating tourism activities; and improving the skills and knowledge of the staff.

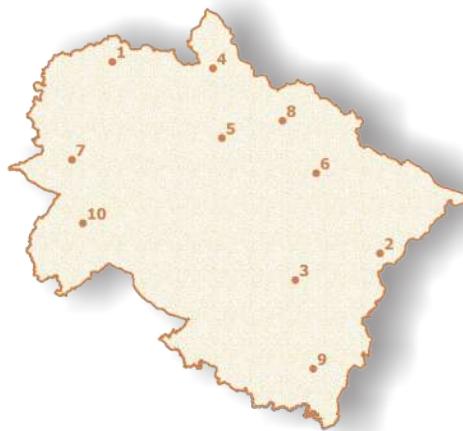
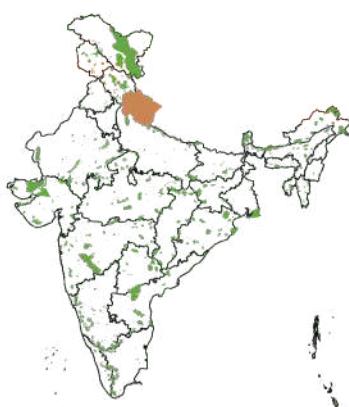
**Trend of MEE scores between first and repeat cycles**

Sl. No	PAs	First Cycle			Repeat Cycle			Trend
		Phase	MEE Score (%)	Category	Evaluation Year	MEE Score (%)	Category	
1	National Chambal WLS	2006-2009	56.1	Fair	2018-2019	59.17	Fair	▲
2	Sohelwa WLS	2006-2009	49.2	Fair	2018-2019	41.66	Fair	▼
3	Chandraprabha WLS	2015-2017	57.5	Fair	2020-2022	62.5	Good	▲
4	Hastinapur WLS	2015-2017	45.69	Fair	2020-2022	47.58	Fair	▲
5	Kaimur WLS	2009-2010	51.56	Fair	2020-2022	51.61	Fair	▲
6	Okhla Bird WLS	2015-2017	55	Fair	2020-2022	63.39	Good	▲
7	Shekha Bird WLS		-		2020-2022	43.97	Fair	-
8	Sohagibarwa WLS	2012-2013	45	Fair	2020-2022	51.56	Fair	▲
9	Sur Sarovar Bird WLS	2015-2017	54.17	Fair	2020-2022	62.07	Good	▲
10	Bakhira WLS	2017-2018	36.67	Poor	2022-2023	43.75	Fair	▲
11	Lakh Bahosi Bird WLS	2017-2018	47.5	Fair	2022-2023	68.75	Good	▲
12	Mahavir Swami WLS	2017-2018	50	Fair	2022-2023	67.19	Good	▲
13	Nawabganj Bird WLS	2017-2018	46.67	Fair	2022-2023	78.91	Very Good	▲
14	Parvati Aranga WLS	2017-2018	45.83	Fair	2022-2023	42.19	Fair	▼
15	Patna WLS	2017-2018	57.5	Fair	2022-2023	62.5	Good	▲
16	Jai Prakash Narayan (Surhatal) Bird WLS	2018-2019	31.67	Poor	2023-2024	29.69	Poor	▼
17	Samam Bird WLS	2018-2019	49.16	Fair	2023-2024	58.59	Fair	▲
18	Samaspur Bird WLS	2018-2019	46.6	Fair	2023-2024	62.5	Good	▲
19	Sandi Bird WLS	2018-2019	48.5	Fair	2023-2024	66.41	Good	▲
20	Turtle WLS	2018-2019	26.66	Poor	2023-2024	33.59	Poor	▲
21	Vijai Sagar WLS	2018-2019	45.83	Fair	2023-2024	64.84	Good	▲
22	Dr. Bhimrao Ambedkar Bird WLS	-	-	-	2023-2024	FD not taken possession	-	-
23	Ranipur WLS	2018-2019	39.16	Poor	-	TR	-	-



# Uttarakhand

Himalayan Monal © Moulik Sarkar



## Uttarakhand

Uttarakhand is located in northern India, with a total area of 53,483.36 Km<sup>2</sup>. The state's forest cover is 24,303.83 Km<sup>2</sup>, accounting for 45.44% of its geographic area (ISFR 2023). In the first cycle of MEE, a total of 10 PAs are assessed. In the repeat cycle, 9 PAs are assessed, and 1 PA is excluded, as it was previously evaluated in the first cycle but now falls under a TR, which undergoes a separate MEE process.

### 1. Govind NP & Govind Pashu Vihar WLS, Uttarakhand (2018-19):

The PA, representing the middle and higher Himalayas in Uttarkashi district, extends over 957.97 Km<sup>2</sup> and was notified as a WLS in 1955. Subsequently, an area of 472.08 Km<sup>2</sup> was designated as a NP, with the WLS currently serving as the buffer zone for the NP. The PA is endowed with snow-clad peaks, glaciers, meadows, waterfalls, rivers, and dense forests, providing habitat for species such as the Snow Leopard, Musk Deer, Himalayan Bear, Barking Deer, Bharal, Goral, and a variety of migratory and resident birds. With unique cultural attributes, the area is a popular trekking destination, attracting about 10,000 trekkers annually.

However, the PA faces significant management challenges, including an acute shortage of staff, with more than 60% of positions vacant. The existing staff lack training in wildlife management. There are 42 villages located within and around the PA, including four within the NP, exerting high biotic pressure. A long-pending proposal to rationalize the boundaries and exclude these four villages from the NP is still unresolved. Additional challenges include transhumant camping and grazing in meadows, annual

forest fires, the presence of both licensed and unlicensed firearms in the villages, inadequate mobility and communication, a lack of ecological information with PA authorities, and insufficient and irregular funding, all of which further weaken management efforts.

**Recommendations** - Recommendations include filling existing vacancies with young, energetic, and trained staff; ensuring regular and sufficient funding; improving physical infrastructure, including staff housing; enhancing coordination with academic and research institutions for systematic ecological research and monitoring; placing educational signage and constructing an interpretation center; developing eco-development programs, including community-centric eco-tourism; improving management of solid waste; and creating a PA Foundation similar to those established for TRs.

### 2. Askot (Musk Deer) WLS, Uttarakhand (2020-22):

The PA, covering 300 Km<sup>2</sup>, forms the international border with Nepal to the east and Tibet to the north. It was finally notified in 2013 after excluding villages that

were included in the initial notification in 1986. The PA exhibits a wide altitudinal variation, ranging from 2,500 to 10,000 feet above sea level. The vegetation transitions from sub-tropical at lower elevations to wet temperate at higher elevations. The PA is home to numerous highly endangered and threatened species of the western Himalayas. Recently, a tiger was photo-trapped within the area. The PA holds high watershed value, with the Gori river flowing through it. Protection camps equipped with GPS, wireless sets, camping gear, and binoculars are regularly visited by staff, who maintain proper records of their movements. The local village panchayats are generally supportive of management efforts, and women's SHGs contribute to reducing resource use from the PA.

Nonetheless, the PA does not have a management plan. It is relatively free from biotic disturbances, but experiences heavy pressure during the summer months due to migrant livestock grazing and the collection of *Ophiocordyceps sinensis*, locally known as Keedajadi. The PA is administered by DFO Pithoragarh, without a senior officer stationed on-site. There is a shortage of staff, and some buildings and equipment are very old, with insufficient high-altitude gear available for staff. Being located along the international border, the PA is vulnerable to poaching of Musk Deer and Black Bears, as well as the illegal collection of NTFPs. Local villagers also report conflicts with leopards and bears.

**Recommendations** - Recommendations include preparing a comprehensive management plan; filling existing staff vacancies; transferring the management of the PA to a dedicated wildlife wing headquartered in Dharchula, equipped with sufficient trained staff; providing better quality high-altitude gear, camping equipment, and arms for staff; repairing dilapidated buildings; and developing tourism facilities, including a proper interpretation center and displays.

### 3. Binsar WLS, Uttarakhand (2020-22):

The PA, covering an area of 40.07 Km<sup>2</sup>, was notified in 1988 and is located in the Kumaon hills. An ESZ was also notified in 2021. Dominated by excellent Oak and Rhododendron forests, the PA boasts high biodiversity, hydrological, cultural, religious, and aesthetic values. An approved management plan is in place. Access to the PA is limited to one approach road, and it is well protected, with proper deployment of protection camps, staff, and equipment, including a satellite phone. The areas surrounding the PA feature many old estates catering to tourists. Additionally, there is an

interpretation center at the entrance to the WLS, offering a good display of relevant information. The PA receives substantial financial support from the district administration.

However, tourism establishments around the PA exert pressure on its resources. Peripheral villages contribute to livestock grazing and occasional tree felling pressures. Half of the frontline staff positions are vacant, and the existing staff are not adequately trained in wildlife management. Conflicts with leopards are on the rise, and scientific data regarding the PA is minimal.

**Recommendations** - Recommendations include filling staff vacancies immediately; preparing publicity and interpretation materials for distribution to visitors; utilizing solar-powered heating for residential, office buildings, and protection chowkis/camps; establishing a specialized team to mitigate HWCs; engaging local communities in developing participatory eco-tourism; enlisting trained nature guides to accompany visitors within the PA; repairing the only road in the PA by collaborating with PWD; improving signage along trekking routes; and partnering with local institutions to build a scientific information base for the PA.

### 4. Gangotri NP, Uttarakhand (2020-22):

The PA, encompassing 2,390 Km<sup>2</sup>, was notified as a NP in 1989. The Gomukh glacier, from which the river Ganga originates, is located within the PA, which is also close to the famous Gangotri temple. Bordering Tibet to the north, this high mountainous PA is renowned for its outstanding scenic beauty, featuring snowcapped peaks, glaciers, high-altitude lakes, meadows, and wet temperate coniferous and broad-leaved forests. The area is home to several rare and threatened wildlife species, including Snow Leopards, Black Bears, Musk Deer, And Blue Sheep. Additionally, the PA includes an ancient trade route to Tibet, maintaining its relative inviolate status. An approved management plan is in place, and a scientific database has been created under the SECURE Himalaya Project, which has strengthened protection infrastructure. Protection camps equipped with high-quality monitoring equipment are situated at strategic locations, and both short and long-range patrolling by staff is a regular part of management. The PA also receives institutional support from organizations such as WII and TRAFFIC India.

Nonetheless, the PA faces challenges due to its location at the international border, resulting in a constant presence and movement of defense personnel. Additionally, there is significant pressure from trekkers



*Azura Sapphire © Anil Partiyal*

visiting the Gomukh glacier and other areas within the PA. The PA is managed under only one range, leading to staff shortages. As an ecologically sensitive area, it experiences increased landslides due to a reported road widening project.

**Recommendations** - Recommendations include revisiting the administrative arrangement to create additional ranges with corresponding staff and protection infrastructure; filling existing staff vacancies; sensitizing defense personnel about the values of the PA and the importance of its protection; building an interpretation center and enhancing visitor facilities near the entry gate; establishing a mid-way resting point on the Gartangali trekking route and posting staff there; and providing staff with high-quality gear for long-range patrolling.

## **5. Kedarnath Musk Deer WLS, Uttarakhand (2020-22):**

The PA, covering approximately 975 Km<sup>2</sup> and spanning two districts, was notified in 1972. It encompasses a geographically diverse landscape with vegetation ranging from sub-tropical to alpine, supporting a variety of wild animals. Of the 28 mammal species reported in the PA, 11 are categorized as endangered or threatened. The trekking route to the famous Kedarnath shrine passes through the PA, which has an approved management plan in place. The PA experiences heavy footfall from pilgrims and trekkers during the summer months. Some encroachments in the Chopta area have been removed, and recommendations have been made to regulate the number and flying height of helicopter services to the Kedarnath shrine. The PA is well protected, with staff regularly patrolling extensive areas. It maintains landscape connectivity with neighboring forests, and WII has undertaken various research projects and installed 28 camera traps in the PA.

However, about half of the protection staff positions



are vacant, and there are 36 illegal settlements around Chopta. During the summer, heavy traffic occurs on the national highway, as well as on foot by pilgrims and trekkers using the trekking routes. Human-Himalayan Black Bear conflicts are a management concern, and EDCs are currently inactive. The helicopter services to Kedarnath shrine also disturb local wildlife.

**Recommendations** - Recommendations include restricting helicopter services as recommended by the CWLW; filling existing staff vacancies and increasing staff strength commensurate with the pressure from pilgrimage and adventure tourism; posting younger staff members; activating EDCs and engaging them in livelihood generation activities; employing a quick response team to address HWCs; and establishing a specialized team to prevent poaching of highly endangered animals.

## 6. Nanda Devi NP, Uttarakhand (2020-22):

The PA, covering 624.27 Km<sup>2</sup>, was notified in 1982 and

is part of the Nanda Devi Biosphere Reserve, a UNESCO World Heritage site that includes significant peaks such as Nanda Devi. The Valley of Flowers NP, a neighboring site, is also part of the Biosphere Reserve. The PA features a diverse array of habitats, including RFs, civil forests, community forests, grassy slopes, alpine meadows, and snow-covered areas, providing shelter to a range of highly endangered and threatened Himalayan flora and fauna. The PA has been completely closed since 1983. Biodiversity monitoring is conducted every ten years, with the most recent assessment completed in 2015, in collaboration with WII. The PA has an effective protection strategy with reasonable equipment support for patrolling and surveillance. In 2020-21, four poaching cases involving musk deer were detected, resulting in the arrest of 18 individuals.

Despite these strengths, the PA currently lacks a management plan, and the position of the ACF is vacant, along with 50% of frontline staff positions. Human-black Bear conflicts present a concern, and there is minimal engagement with local communities. Additionally, the staff requires better equipment for patrolling in extreme weather conditions and lacks wildlife-specific training.

**Recommendations** - Recommendations include filling existing staff vacancies and increasing the number of personnel to match the protection responsibilities across this vast and challenging terrain; completing the revision of the management plan; providing high-tech equipment for long-range patrolling and camping in high altitudes; and engaging local communities in PA protection and livelihood improvement activities through the establishment of EDCs.

## 7. Mussoorie WLS, Uttarakhand (2022-23):

Mussoorie WLS, extending over an area of 36.88 Km<sup>2</sup>, was notified in 1993. The sanctuary is surrounded by patches of RFs and private estates, which provide robust forest cover and serve as bio-corridors. It acts as a catchment area for many streams, supplying water to Mussoorie town and several downstream villages. The establishment of the sanctuary has enabled control of limestone mining in the Mussoorie hills, facilitating significant ecological recovery. It is home to several eco-sensitive, rare, and/or restricted-range faunal species, including the Himalayan Quail, which is believed to be extinct. The sanctuary features a good network of trails and trekking routes, making it ideal for



*Ultramarine Flycatcher © Rajdeep Mitra*

day visits, and experiences low biotic pressure.

However, the eight forest blocks that make up the sanctuary are disconnected and spread across different ranges within the Mussoorie Forest Division. The absence of a notified ESZ complicates efforts to regulate rapid development around the PA. The final notification of the sanctuary and settlement of rights are still pending, and the area suffers from a shortage of funds and trained staff. There is also limited engagement with stakeholders, including EDCs, estate owners, and tour operators. The draft management plan is awaiting approval.

**Recommendations** - Recommendations include reorganizing the PA into one consolidated block by merging adjacent territorial compartments and issuing the final notification; notifying the ESZ; establishing a multi-stakeholders' forum to elicit support for PA protection; reviving the defunct EDCs (six in total) to benefit both the PA and local communities; developing an interpretation center and an interactive web portal; ensuring immediate approval of the draft management plan; and improving funding and staff training initiatives.

## 8. Valley of Flowers NP, Uttarakhand (2022-23):

Valley of Flowers NP, covering an area of 87.50 Km<sup>2</sup>, was notified in 1982 and inscribed as a World Heritage Site in 2005. Discovered and described in 1938 by Frank S. Smythe in his famous travelogue "The Valley of Flowers," the PA serves as the core zone of the Nanda Devi Biosphere Reserve, forming a unique transition

zone between the Zanskar and Great Himalaya mountain ranges. The PA is a treasure trove of exquisite floral and faunal biodiversity, showcasing a myriad of alluring flowers. It encompasses tree line forests, alpine meadows, snow-clad mountains, and glacial valleys, housing about 500 species of wild flowers, 13 species of mammals, and several bird species, many of which are rare and highly endangered. The area also possesses significant hydrological and aesthetic values. Visitor movement is allowed during the summer months and is properly regulated within the NP. The PA has been well studied and has solid scientific baseline information.

Despite its global recognition as a conservation area, the PA suffers from inadequate staff facilities and capacities, the absence of an interpretation and visitor center, and insufficient publicity and display materials. The forests in the ESZ are vulnerable to illegal felling, collection of caterpillar mushrooms, and medicinal plants, as well as seasonal encroachments. Additionally, massive religious pilgrimages to the Hemkund Sahib shrine lead to crowding and pollution near the PA. Human-Black Bear conflicts have also been reported in villages adjacent to the sanctuary. Furthermore, there is currently no management plan in place.

**Recommendations** - Recommendations include demarcating the ESZ boundaries, particularly around Van Panchayat forests; strengthening overall protection infrastructure, especially considering the location and terrain of the PA; increasing staff numbers, facilities, and capacities; improving the entrance to the PA and developing better interpretation and visitor

centers along with interpretative materials and displays; stabilizing the slopes and enhancing the trail to the valley; improving monitoring of invasive species; establishing several weather stations; and engaging with EDCs in the surrounding area to improve livelihoods and expand nature education.

## 9. Nandhaur WLS, Uttarakhand (2024-25):

The PA, covering 295.96 Km<sup>2</sup>, was notified on 14 December 2012 and is located in the Shivalik-Bhabar region of the Terai Arc Landscape. It spans three districts and serves as a vital connectivity corridor between the Corbett and Rajaji landscapes and the Pilibhit-Dudhwa region, extending into the Terai area of Nepal. The PA is home to a diverse array of wildlife, including tigers and elephants, as well as 230 species of birds and a healthy population of Mahseer fish. As an important Sal-bearing area, it also serves as the catchment for the Nandhaur and Kalaunia rivers, which support several villages downstream. An excellent

management plan is in place.

However, the PA does not have an independent administration and is managed as a cluster of ranges under the Haldwani Territorial division. There are a few settlements along the southern margin of the PA, as well as hill villages along the northern boundary, contributing to HWCs, lopping, livestock grazing, encroachments, weed proliferation, forest fires, and illegal movements through the PA. Additionally, staff are not adequately trained in wildlife management.

**Recommendations** - Recommendations include placing the notified area under the jurisdiction of an ACF with a dedicated budget line within the Haldwani Division; notifying an ESZ; mapping Mahseer habitats and implementing their protection; managing Teak plantations as wildlife habitats; removing invasive weeds; regulating vehicular movement inside the PA; implementing community-centric eco-development programs, including eco-tourism; improving staff

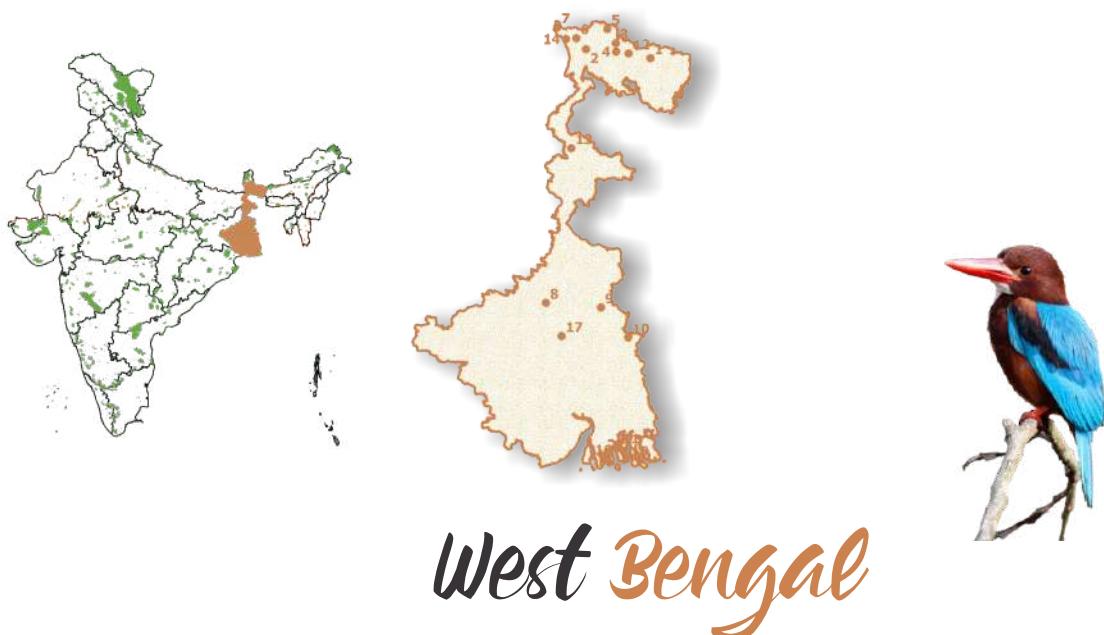
*Trend of MEE scores between first and repeat cycles*

Sl. No	PAs	First Cycle			Repeat Cycle			Trend
		Phase	MEE Score (%)	Category	Evaluation Year	MEE Score (%)	Category	
1	Govind NP & Govind Pashu Vihar WLS	2006-2009	52.3	Fair	2018-2019	48.33	Fair	▼
2	Askot Musk Deer WLS	2015-2017	47.32	Fair	2020-2022	35.16	Poor	▼
3	Binsar WLS	2015-2017	51.67	Fair	2020-2022	60.94	Good	▲
4	Gangotri NP	2012-2013	46.67	Fair	2020-2022	65.63	Good	▲
5	Kedarnath Musk Deer WLS	2012-2013	59.17	Fair	2020-2022	57.26	Fair	▼
6	Nanda Devi NP	2009-2010	75.78	Very Good	2020-2022	54.17	Fair	▼
7	Mussoorie WLS	2017-2018	57.5	Fair	2022-2023	63.28	Good	▲
8	Valley of Flowers NP	2017-2018	70.83	Good	2022-2023	62.5	Good	▼
9	Nandhaur WLS	2018-2019	54.16	Fair	2024-2025	60.94	Good	▲
10	Rajaji NP	2006-2009	59.1	Fair	TR	--	-	-



West Bengal

Blue-throated Barbet ©Aritra Roy



## West Bengal

West Bengal is located in eastern India, with a total area of 88,752 Km<sup>2</sup>. The state's forest cover is 16,832.33 Km<sup>2</sup>, accounting for 18.96% of its geographic area (ISFR 2023). In the first cycle of MEE, a total of 15 PAs are assessed. In the repeat cycle, 13 PAs are assessed. However, in the repeat cycle, 2 PAs are excluded as they fall under CMPA, and 1 PA is excluded as it falls under a zoo, all of which were previously evaluated in the first cycle but now undergo separate MEE processes.

### 1. Jaldapara NP, West Bengal (2018-19):

Jaldapara NP, covering an area of 216.51 Km<sup>2</sup>, is situated in West Bengal and is part of the Eastern Dooars ER. It serves as a crucial connecting link between Buxa TR and Gorumara NP within the state. The savannah-grassland habitat, enriched by good water sources including the Torsa river, is home to a variety of wildlife, including Rhinoceroses and elephants. The population of Rhinoceroses has significantly increased to over 200 from just 14 in 1985, thanks to effective protection measures. The PA features an extensive network of protection camps, watchtowers, trained and well-equipped staff, and supportive EDCs, which also manage tourism and receive 40% of the revenue generated.

However, the PA faces challenges from the presence of two villages inside the sanctuary and 30 villages in the fringe area, which exert heavy resource extraction pressure. The PA's trouser-like shape, characterized by two elongated arms and a narrow neck connecting them, makes it porous and vulnerable to poaching and other illicit activities. Ongoing human-elephant conflicts, annual fires, weed infestations, the presence of NH 31C and a railway line within the PA, dolomite

deposits in the rivers, an aging staff population, and the absence of permanent Mahouts all pose serious management challenges.

**Recommendations** - Important recommendations include posting younger staff; relocating enclaved villages outside the PA; closing illegal entry points to prevent unauthorized movement of people and cattle; prescribing speed limits for motor vehicles and trains to avoid accidental killings of wildlife; improving warning signage; coordinating with neighboring tea estates and army establishments for better corridor management; and conducting need-based systematic research and monitoring.

### 2. Mahananda WLS, West Bengal (2018-19):

Mahananda WLS, covering an area of 157.56 Km<sup>2</sup>, is situated near Siliguri town and features a compact area with well-defined natural boundaries, boasting excellent natural forests and fodder plantations that harbor rich wildlife. The Mahananda river flows through the PA, which is protected by a well-deployed staff and anti-poaching patrolling teams, including local villagers. The EDCs are active and effectively support the management of the PA.

However, the PA is surrounded by tea gardens and over 50 villages with a population of about 50,000, many of whom depend heavily on the resources of the PA. Management challenges include illicit grazing, lopping of trees, collection of fuelwood for Sale, felling and removal of timber by sawmills and furniture-making units, and collection of boulders. Additionally, there is a constant human-elephant conflict, drying up of some streams, accidental deaths of wildlife due to the movement of trains and vehicles, and the presence of Teak plantations, which pose serious management challenges.

**Major recommendation** - The suggestions for improvement include better coordination with railway authorities to regulate speeds within the PA; constructing speed breakers and speed warning signage on NH31 within the PA; enhancing engagement with local communities for PA protection and mitigating human-elephant conflict; developing community-centric eco-tourism initiatives to improve livelihoods; constructing an interpretation center, and promoting nature education and awareness; improving publicity and outreach; and managing Teak plantations as wildlife habitats.

### 3. Chapramari WLS, West Bengal (2020-22):

Chapramari WLS, covering an area of 96.07 Km<sup>2</sup>, is one of the oldest RFs in West Bengal, notified in 1998. The sanctuary is part of a vital landscape for long-ranging animals, connecting RFs and PAs in West Bengal to the south, and Sikkim and Bhutan to the north. It is a potential area for Rhino conservation as part of an integrated landscape with Gorumara NP and is a popular tourist destination. An ESZ was notified in 2018.

The PA is adjacent to three tea gardens, which do not have an effective interface with PA management. The movement of labor, use of pesticides, and wildlife conflicts are associated with these tea gardens. Additionally, the Siliguri-Alipur Duar railway track runs through the southern section of the sanctuary, which has resulted in the deaths of many animals, including elephants and leopards, while attempting to cross the area.

**Recommendations** - Recommendations include filling the vacant staff posts; implementing the proposed integrated management of the landscape, including the RFs and PA areas; providing adequate funds to carry out proposed activities; developing suitable grassland areas; establishing an interpretation center and enhancing nature education activities;

coordinating with railway authorities to develop a mitigation strategy to prevent accidents on the railway lines; and improving coordination with tea garden management.

### 4. Gorumara NP, West Bengal (2020-22):

Gorumara NP extends over 79.45 Km<sup>2</sup> and was notified in 1994. It is connected to Chapramari WLS through forest blocks of the Jalpaiguri Division to the north, which further connects to Neora Valley NP, linking PAs in Sikkim and Bhutan. This integrated landscape is vital for the survival of a diverse range of animals and plants. A management plan has been submitted for approval.

The PA faces several management challenges, including numerous vacancies among staff and inadequate protection infrastructure. The existing grasslands within the PA are insufficient to support populations of Rhinos, Gaurs, and elephants simultaneously. Additionally, there are a few tea gardens in the vicinity, which contribute to severe HWCs. The PA also suffers from inadequate funding and delays in the release of funds.

**Recommendations** - Recommendations include implementing the proposed integrated management plan for the landscape, including RFs and PA areas; improving grassland management and developing additional grasslands in open areas within the PA while controlling the invasion of shrub-like vegetation, particularly between the Murty and Jaldhaka rivers; obtaining approval for the management plan; conducting long-term ecological studies on habitats and mega herbivores; improving coordination with tea garden management; and enhancing staff strength, deployment, fund flow, and publicity along with nature education and interpretation programs.

### 5. Neora Valley NP, West Bengal (2020-22):

The PA, one of India's oldest RFs was established in 1992, covers 159.78 Km<sup>2</sup>. It features a wide altitudinal and environmental gradient, ranging from 183 to 3,200 meters above sea level. The PA is part of a larger conservation landscape, connecting Pangolakha WLS in Sikkim, Jigme Singye Strict Nature Reserve, and Gygme Dorji NP in Bhutan to the north, and the forests of the Jalpaiguri Division connected to Chapramari WLS and Gorumara NP to the south. The PA provides water to Kalimpong town and neighboring areas and benefits from the involvement of about 20 prominent NGOs in protection, outreach, and capacity building, alongside an active PA Advisory Committee. It is recognized for its high biological, ecological,



hydrological, cultural, and aesthetic values, with an ESZ notified in 2017 and an approved management plan. Women's SHGs are engaged in various livelihood generation activities.

Despite these strengths, the PA faces significant management challenges, with 48 out of 65 staff positions vacant. There is a small village located inside the southern boundary, contributing to associated biotic disturbances. Additional issues include inaccessibility, mobility, and communication difficulties in certain areas of the PA. Moreover, staff members are inadequately trained in wildlife management, and the boundaries adjacent to tea gardens and other habitations are vulnerable to human and cattle intrusions.

**Recommendations** - Recommendations include regulating activities in the ESZ as proposed; filling existing vacancies immediately; properly marking and consolidating the boundaries; improving staff

capacities and facilities; exploring the possibility of proposing the landscape as a TR, as tiger presence has been reported in the area; and expanding the number and scope of EDCs to enhance livelihood improvement and PA protection efforts.

#### **6. Senchal WLS, West Bengal (2020-22):**

The PA, extending over 38.6 Km<sup>2</sup>, is located very close to Darjeeling town and its suburbs, providing crucial water security to the town. It forms the catchment area for the Teesta and Balson rivers, as well as Senchal lake. With an altitudinal gradient between 1,500 to 2,650 meters above sea level, the area receives very high rainfall and offers habitats for a range of East Himalayan flora and fauna. It maintains ecological continuity with neighboring forest areas and is further connected to Singalila NP, creating an important forested landscape across India, Nepal, and Bhutan. The PA is administered by the Darjeeling Wildlife Division, with intensive patrolling conducted by staff



Ruddy Shelduck © Ayan Khanra

and JFMC members. EDCs are active in eco-tourism, pilgrimage management, and livelihood generation activities. Dependence on fuelwood has been reduced due to the provision of LPG connections by the management. An ESZ was notified in 2021.

However, the PA faces challenges, including a high tourist footfall at Tiger hill and Senchal temple, an acute shortage of staff, and inadequacies in staff mobility, training, and equipment. Additionally, there is a shortage of funds and delays in timely fund releases. The PA also experiences biotic pressure from adjoining tea gardens and villages, along with a profuse growth of Maling Bamboo (*Arundinaria maling*).

**Recommendations** - Recommendations include filling existing staff vacancies, improving protection infrastructure, and enhancing staff capacities and facilities. Exploring the addition of territorial areas in Kurseong and Darjeeling for long-term conservation benefits should be considered. Introducing drone-

based surveillance and preparing a landscape level perspective plan, including developing a SOP to engage various stakeholders and create corridors for Brown Bears and Serows, is essential. Engaging with scientific institutions, NGOs, and academia for research projects—especially regarding ecological services like stream flows, climate change, and medicinal plants—is recommended. Conducting an annual bird count, upgrading the Tiger hill interpretation center, continuing education and awareness programs, and tapping financial resources from tea estates and business establishments through CSR initiatives are vital for enhancing management efforts. Additionally, mitigating human-Black Bear conflicts will be necessary to ensure the sanctuary's sustainability.

### 7. Singalila NP, West Bengal (2020-22):

The PA, covering 78.60 Km<sup>2</sup>, is located at the northwestern boundary of Darjeeling district, abutting Nepal, and was notified in 2017. It represents a biogeographic mix of Himalayan and Indo-Malayan faunal elements, with noteworthy endemism in its floral components. The Red Panda is the iconic species of the park, which boasts rich avifaunal diversity. An ESZ has been notified, and a management plan is in place. The successful Red Panda Research and Monitoring Project, implemented through CSS funds and run in collaboration with ATREE, WWF, and Kolkata University, has been ongoing for two years. There is also an ongoing soft release of Red Pandas with the assistance of Darjeeling Zoo. The PA has good protection infrastructure and features two women's SHGs engaged in livelihood improvement projects.

However, the PA faces challenges due to a permanent staff deficit, with temporary staff deployed from partner agencies. The area experiences significant tourist footfall, leading to associated pollution, and tourism in Nepal has spillover effects on the PA. No vehicles are permitted within the PA, and due to its position at the international border, staff occasionally face challenges from the presence of the para-military force in their own areas. The SSB camps and movement of security forces within the PA present additional management concerns.

**Recommendations** - Recommendations include posting trained permanent frontline staff; curbing plastic pollution generated by hotels on both sides of the border; preparing a long-term Red Panda habitat augmentation plan at the landscape level; providing women-friendly facilities along trekking routes and at camps; engaging with the SSB for improved



Pallas Gull © Ayan Khanra

coordination and support; expanding the category of stakeholders to include hoteliers and tour operators from Nepal; collaborating with territorial divisions to protect Salamander habitats; enhancing research and monitoring programs; and upgrading the interpretation center and outreach functions of the PA.

### 8. Ballavpur WLS, West Bengal (2022-23):

The PA, covering 201 hectares and located close to Vishwa Bharati University within the town of Shantiniketan, was formerly a deer park and was notified as a WLS in 1977. A 100-meter-wide ESZ surrounding the PA was notified in 2020. The terrain represents the vegetation of the Central Indian Highlands. Over the years, Blackbucks, Mouse Deer, Spotted Deer, and turtles have been released into the area, but currently, only a healthy population of Spotted Deer remains, which are fed concentrates by animal keepers. There are three water bodies occupying about 40 hectares that attract winter migratory birds. The deer, birds, turtles, and scenic beauty of the PA draw approximately 70,000 tourists annually. The PA is well protected, being fenced all around.

However, the PA experiences management problems due to the extensive presence of non-palatable species such as *Acacia auriculiformis*, *Acacia mangium*, and *Cassia siamea*. A significant portion of the funds is utilized for feed concentrates for the Spotted Deer, while the water bodies are shrinking and becoming polluted, with a notable presence of Water Hyacinth. Additionally, there are broken fences in places,

inadequate funds for maintenance works, dysfunctional EDCs, inadequately trained staff in wildlife management, and insufficient facilities for bird watching and nature education camps. Tourist cottages are managed by the Forest Corporation instead of the PA management.

**Recommendations** - Recommendations include preparing a consultative and scientific plan for desilting, de-weeding, and restoring the water bodies; ensuring sufficient funding for proper maintenance of the fence, watchtower, nature trails, habitat management, and animal upkeep; progressively eliminating the stall feeding of deer; enlisting the assistance of Vishwa Bharati University in creating baseline information and conducting periodic research and monitoring; improving education and interpretation programs; and training staff in wildlife management.

### 9. Bethuadahari WLS, West Bengal (2022-23):

Prior to its notification as a WLS in 1980, this PA was a deer park, covering 165.61 acres. Representing the Lower Gangetic Plains, the PA has historically seen extensive plantation activities and herbivore releases. Currently, only Spotted Deer are present. The PA is completely fenced and well protected, featuring several artificially created large, perennial water ponds that attract birds. It includes nature trails, an aviary, an interpretation center, and two eco-huts for tourists. EDCs actively participate in tourism and nature education activities, and many seized exotic birds are

housed in the aviary.

Although the PA is now officially designated as a WLS, its management largely retains its orientation towards being a deer park. Visitors often perceive it as an urban park and mini zoo. Stall feeding of Spotted Deer was halted in 2021; however, a significant portion of the PA's funding is still allocated to the weekly feeding of cut grass and feed concentrates for the deer. The invasive species *Polyalthia suberosa* has spread widely within the PA, and very few fruit trees are present. Additionally, the staff is inadequately trained in wildlife management.

**Recommendations** - Recommendations include approaching the CZA for the establishment of an animal rescue and rehabilitation center; improving the facilities and increasing the number of aviaries; posting an ornithologist, biologist, or veterinarian to support wildlife management; cultivating palatable grasses within the PA; systematically removing exotic plants like *Polyalthia* and *Eucalyptus*; enhancing nature education and interpretation activities and infrastructure; and improving staff mobility and communication.

## 10. Bibhuti Bhusan WLS, West Bengal (2022-23):

The PA, covering 64 hectares, is the only recorded RF in the North 24 Parganas district and functioned as a deer park prior to its notification in 1978. Representing the Lower Gangetic Plains, the PA is surrounded by the Ichhamati river, which floods the area annually. Both the PA and the riverbanks attract a significant number of birds. With good documentation of local plants and animals, nature trails, displays, and an interpretation center, the PA is well-visited by tourists, including students. The deer population consists of 554 Spotted Deer, which have been built from a founder population of 18 captive-bred animals.

However, the deer population's genetic diversity is vulnerable due to being derived from a small founding group, leading to concerns about inbreeding depression. A significant portion of the PA's funds is allocated for stall feeding the deer. Additionally, the extensive growth of unpalatable vegetation, a shortage of staff, lack of proper wildlife training, poor involvement of local people, and the continued practice of stall feeding negatively impact management efforts.

**Recommendations** - Recommendations include exploring the possibility of translocating some Spotted

Deer to nearby PAs and forests; systematically planning for habitat improvement that enhances the availability of palatable vegetation for herbivores; systematically removing invasive weeds from the PA; creating perennial water bodies and planting suitable trees to support wintering birds; improving the genetic stock of Spotted Deer; assessing biodiversity and habitats to increase the diversity of herbivores; engaging local communities and educational institutions for outreach functions; and enhancing visitor facilities.

## 11. Chintamani Kar Bird WLS, West Bengal (2022-23):

Representing the Lower Gangetic Plain, this bird sanctuary covers an area of 17.82 acres and is located in North 24 Parganas. It was notified in 2004 and is well protected by a masonry wall. The PA is fed by the Adi Ganga feeder canal in the western part. As an important green area amidst the bustling human landscape, the well-protected PA provides a safe haven for various birds, small mammals, and reptiles. The sanctuary benefits from good documentation of local species, well-laid-out nature trails, reasonably good facilities for bird watching, and strong support from local communities, all of which enhance its value.

However, the sanctuary faces several management weaknesses, including the absence of an approved management plan, only seasonal water availability, a profusion of invasive weeds such as *Mikania*, *Eupatorium*, and *Ageratum*, inadequate publicity and interpretative materials, and insufficient staff capacities and amenities.

**Recommendations** - Recommendations include augmenting the water supply to the PA and ensuring consistent supply during the lean season; systematically removing invasive weeds and planting the area with fruit-bearing trees; creating spacious watchtowers for bird watching and surveillance; upgrading nature interpretation facilities and improving the quality of displays and publicity; enhancing staff housing and visitor amenities; and accurately recording the coordinates of the PA boundary.

## 12. Pakhi Bitan Bird WLS, West Bengal (2022-23):

Located on the upstream of Teesta barrage in the Gajaldoba water body, the PA, extending to 10.25 Km<sup>2</sup>, was notified in 2018. The western boundary is delimited by forests of Darjeeling Wildlife Division, and eastern by Baikunthapur Forest Division. The sanctuary

is characterized by the artificial reservoir with swampy foreshore area that have many small shifting islands, which get periodically inundated during the monsoon. A significant ecological corridor, the PA attracts several resident and migratory birds.

The PA is not delineated on the ground, nor has it been handed over to the FD. The PA also suffers from villages and agriculture within, roads and rural markets, chemically laden surface run off to water body, and a shooting range of the Indian Army. The PA, practically, exists on paper.

**Recommendations** – Formally take over the PA area from irrigation department and create a PA management establishment with proper infrastructure and publicity; engage with local communities to develop participatory eco-tourism, focusing on bird watching and livelihood improvement of locals; establish PA as a bird watching, nature education and interpretation area; train local youth in bird watching and nature education; involve local NGOs to help PA management in outreach functions.

### 13. Raiganj WLS, West Bengal (2024-25):

The PA, known as Kulik Bird Sanctuary, covers 1.30 Km<sup>2</sup> and is situated in Uttar Dinajpur district, where it was notified in 1985. This outstanding breeding ground supports between 70,000 and 90,000 migratory birds and is formed by the river Kulik, which delineates the eastern and southern boundaries of the PA. It is home to 114 bird species, 18 species of reptiles, and 36 species of fish. Additionally, it serves as one of the largest breeding grounds for the Asian Openbill and hosts approximately 2,000 flying foxes that roost there. The PA acts as a popular nature education center, attracting about 100,000 visitors annually, and features dry deciduous forests, an aviary, aquariums, a butterfly park, an interpretation center, an auditorium, an animal rescue center, and a turtle pond. An EDC is functional within the sanctuary.

However, the PA faces several management challenges, including a shortage of staff to effectively manage the various educational and recreational facilities, poor quality of roads and walkways, absence of ecological research, a subpar interpretation center, inadequate visitor amenities, and the presence of NH12, which bisects the PA.

**Recommendations** - Recommendations include strengthening staff housing and overall protection infrastructure; procuring fiber-glass boats; improving the interpretation center and other recreational and visitor facilities; introducing a few deer species;

systematically implementing ecological research and monitoring; enhancing staff capabilities in wetland and visitor management; establishing a shopping outlet for the EDC/SHGs; improving publicity and outreach efforts; installing CCTV cameras; ensuring improved funding; and facilitating exposure visits for staff to organizations that focus on solid waste management.

### 14. Jorepokhri (Salamander) WLS, West Bengal (2024-25):

The Salamander Sanctuary, covering a small patch of approximately 10 acres of forest in the Darjeeling hills, was notified in 1985 as a designated PA. However, due to various administrative and political reasons, about seven acres of this area has been transformed into a tourist hub featuring a tourist lodge, a drinking water lake, car parking, and homesteads, which means the PA remains a sanctuary only in name. Based on the recommendations of the expert committee constituted by the State Wildlife Board, the CWLW of West Bengal proposed the denotification of this area in 2013, but a final decision on the matter is still pending. Additionally, an ESZ of approximately 350 acres around the PA was proposed in 2019 but has yet to be notified.

**Recommendations** - The MEE team recommends rationalizing the boundaries of the PA instead of pursuing complete denotification. This rationalization should exclude the seven acres of concretized and transformed land while adding the remaining three acres to the proposed 350 acres of the ESZ, thereby issuing a final notification for 353 acres of the Jorepokhari WLS. Moreover, areas with known Salamander presence, such as Namthing Pokhari (2.5 ha) under Kurseong jurisdiction, along with Pokhritar Salamander Park and Herbal Garden, should be declared as conservation/community reserves or satellite areas of Jorepokhari WLS. These areas should be formally transferred to the FD for effective management, after which systematic management actions should commence under a proper management plan.

***Trend of MEE scores between first and repeat cycles***

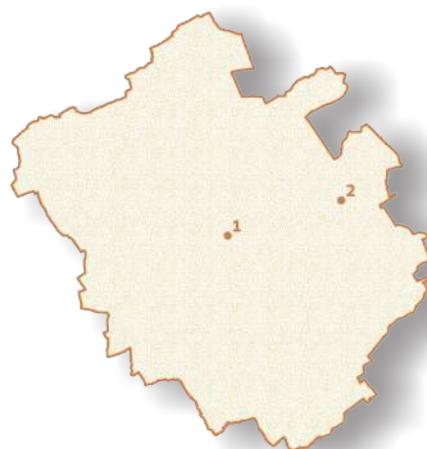
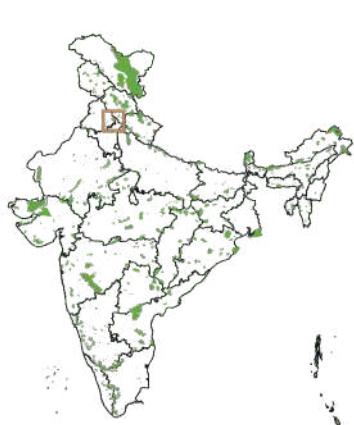
Sl. No	PAs	First Cycle			Repeat Cycle			Trend
		Phase	MEE Score (%)	Category	Evaluation Year	MEE Score (%)	Category	
1	Jaldapara NP	2006-2009	76.5	Very Good	2018-2019	80.83	Very Good	▲
2	Mahananda WLS	2006-2009	63.6	Good	2018-2019	71.67	Good	▲
3	Chapramari WLS	2012-2013	79.17	Very Good	2020-2022	77.34	Very Good	▼
4	Gorumara NP	2006-2009	84.1	Very Good	2020-2022	79.69	Very Good	▼
5	Neora Valley NP	2009-2010	81.06	Very Good	2020-2022	73.44	Good	▼
6	Senchal WLS	2015-2017	75.83	Very Good	2020-2022	75	Very Good	▼
7	Singalila NP	2006-2009	81.8	Very Good	2020-2022	79.69	Very Good	▼
8	Ballavpur WLS	2015-2017	60.83	Good	2022-2023	61.72	Good	▲
9	Bethuadahari WLS	2017-2018	51.92	Fair	2022-2023	69.53	Good	▲
10	Bibhuti Bhusan WLS	2017-2018	58.93	Fair	2022-2023	62.5	Good	▲
11	Chintamani Kar Bird WLS	2017-2018	66.67	Good	2022-2023	54.69	Fair	▼
12	Pakhi Bitan Bird WLS	-	-	-	2022-2023	29.69	Poor	-
13	Raiganj WLS	2018-2019	81.03	Very Good	2024-2025	82.03	Very Good	▲
14	Jorepokhri (Salamander) WLS	-	-	-	2024-2025	Notification awaited	-	-
15	Haliday Island WLS	2018-2019	77.27	Very Good	-	CMPA	-	-
16	Lothian Island WLS	2015-2017	77.5	Very Good	-	CMPA	-	-
17	Ramnabagan WLS	2015-2017	51.67	Fair	-	Zoo	-	-



# Chandigarh

Short-eared Owl © Rajdeep Mitra

©Rajdeep



# Chandigarh

Chandigarh is situated in the northern India, with a total area of 114 Km<sup>2</sup>. The state's forest cover is 25 Km<sup>2</sup>, which is 21.93% of its total area (ISFR 2023). In the first and repeat cycles of MEE, 2 PAs were assessed.

## 1. City Bird WLS, Chandigarh (2020-22):

The City Bird WLS, popularly known as Parrot WLS, is located in Sector 21 and was notified as a WLS in 1994 after being transferred from horticulture Department to the FD. It covers an area of approximately 4.5 hectares and is well protected by a wall surrounding the PA, with no resource constraints. However, there is an absence of a proper management plan, and a decline in the Parakeet population has been reported over the years, decreasing from 10,000 to 2,000 individuals.

**Recommendations** - Recommendations include drafting a proper management plan, posting dedicated staff, maintaining an entry register, periodically counting parrots and other birds, and improving signages and information displays.

## 2. Sukhna Lake WLS, Chandigarh (2020-22):

Spread over 2,600 ha, the Sukhna Lake WLS, notified in 1998, serves as the green lung of Chandigarh. Located at the base of the Shivalik hills, it acts as the catchment

area for Sukhna lake, with no villages inside and fringe villages not relying on the sanctuary for their livelihoods. The southern areas bordering these villages are fenced. A management plan is in place, and the interpretation center attracts a large number of visitors, with timely and adequate fund flow.

However, there are problems with feral cattle and stray dogs damaging habitats and attacking small wild animals. Additionally, staff training is inadequate.

**Recommendations** - Recommendations include demarcating core and buffer areas on the ground, phasing out old *Eucalyptus* plantations in favor of broad-leaf native trees, controlling *Lantana*, obtaining legal permission to de-silt small reservoirs in the sanctuary, expediting the acquisition of 450 ha of revenue/private land to create the Sukhna corridor, managing feral cattle and stray dogs, improving staff capacity in scientific monitoring and outreach, and exploring the possibility of releasing Spotted Deer kept in captivity.



Black-hooded Oriole © Vivek Sarkar

*Trend of MEE scores between first and repeat cycles*

Sl. No	PAs	First Cycle			Repeat Cycle			Trend
		Phase	MEE Score (%)	Category	Evaluation Year	MEE Score (%)	Category	
1	City Bird WLS	2017-2018	55	Fair	2020-2022	83.59	Very Good	▲
2	Sukhna Lake WLS	2015-2017	80	Very Good	2020-2022	86.72	Very Good	▲



# Dadra & Nagar Haveli and Daman & Diu

Common Sandpiper © Vivek Sarkar





## Dadra & Nagar Haveli and Daman & Diu

Dadra & Nagar Haveli and Daman & Diu located in the western India, spanning over 602 Km<sup>2</sup>. The state's forest cover is 225.62 Km<sup>2</sup>, which is 37.48% of its total area (ISFR 2023). In the first cycle of MEE, 1 PA was assessed. In the repeat cycle, 2 PAs were evaluated.

### 1. Dadra & Nagar Haveli WLS, Dadra & Nagar Haveli and Daman & Diu (2020-22):

Dadra & Nagar Haveli WLS extends to 91 Km<sup>2</sup>, covering about 19% of the Union Territory area. Notified in 2020, it features herbivore and lion safaris, with a good ungulate population providing interpretation opportunities. A 100-meter wide ESZ surrounds the PA, and it benefits from wildlife-trained staff and support from NGOs for livelihood programs. However, there is no management plan in place, and the sanctuary faces issues such as severe grazing, fuelwood collection, and fragmented habitats. Additionally, the compliance status regarding previous MEE recommendations remains unchanged.

**Recommendations** - Recommendations include preparing a management plan, intensifying patrolling, considering rewilding of ungulates, introducing rotational grazing in the herbivore safari, and starting eco-camps for nature education and interpretation.

### 2. Fudam Bird WLS, Dadra & Nagar Haveli and Daman & Diu (2020-22):

The PA, spanning 40 Km<sup>2</sup>, is situated in the intertidal

region of Gujarat and Diu islands. Notified in 2021, it contains a mosaic of terrestrial habitats, tidal mudflats, mangroves, and creek habitats, and has the potential to become a Ramsar site, with over 60,000 birds arriving annually and 51 species documented. The area experiences no biotic disturbance, showcases good efforts in mangrove regeneration, and enjoys a favorable perception among local people. However, there is no management plan in place.

**Recommendations** - Recommendations include preparing a management plan and involving bird watchers and biologists for periodic bird surveys and biodiversity assessments.



Yellow-footed Green Pigeon © Vivek Sarkar

*Trend of MEE scores between first and repeat cycles*

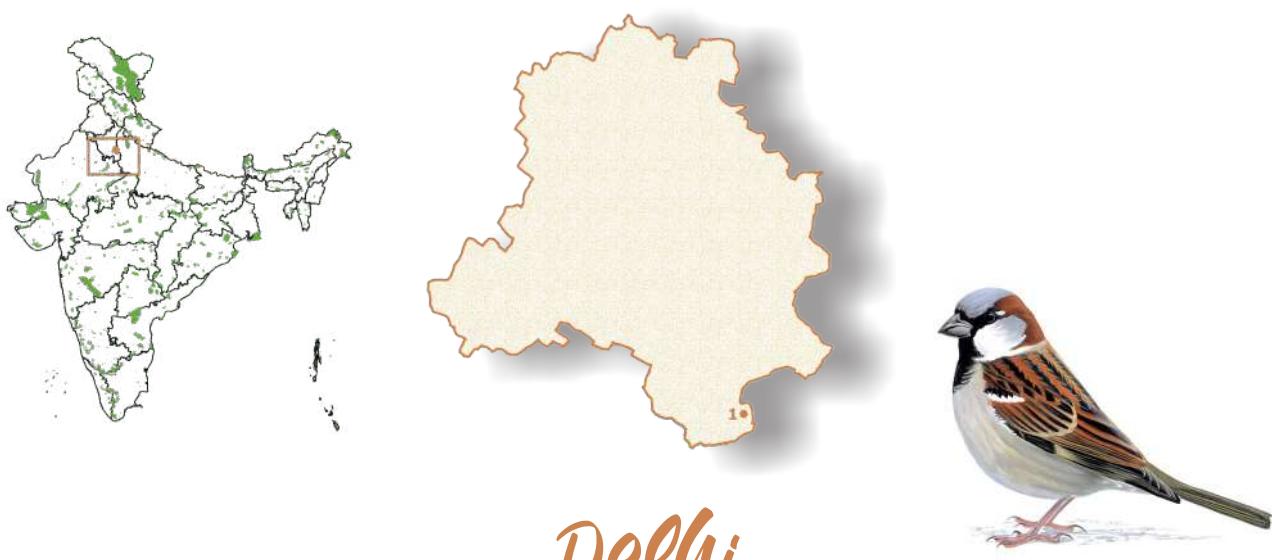
Sl. No	PAs	First Cycle			Repeat Cycle			Trend
		Phase	MEE Score (%)	Category	Evaluation Year	MEE Score (%)	Category	
1	Dadra & Nagar Haveli WLS	2015-2017	57.5	Fair	2020-2022	57.81	Fair	▲
2	Fudam Bird WLS	-	-	-	2020-2022	57.81	Fair	-



Deekhi



Scaly-breasted Munia © Vivek Sarkar



## Delhi

Delhi is situated in the northern India, with a total area of 1,483 Km<sup>2</sup>. The state's forest cover is 195.28 Km<sup>2</sup>, which is 13.17% of its total area (ISFR 2023). In the first and repeat cycles of MEE, 1 PA was assessed.

### 1. Asola-Bhatti WLS, Delhi (2020-22):

Situated at the terminal end of the Aravalli (south Delhi Ridge), the PA extends to over 31 Km<sup>2</sup> and provides a tenuous corridor to Sariska TR. Notified in 1986 and later extended in 1991, this area was once an open pit mining site, with excavated pits now transformed into small lakes. An ESZ was notified in 2017 following a Supreme Court order in 2011. Blackbuck and Spotted Deer were released from Delhi Zoo into the area, enhancing its status as the green lung of Delhi. The PA also features a large enclosure for problematic monkeys, whose numbers are progressively increasing, and good work has been done on habitat improvement. There is potential for ecological contiguity with Haryana forests through community lands, along with effective complaint redressal and a management plan in place.

Despite being fenced, the PA faces challenges from cattle and local people intruding, which threatens water bodies. Neighboring communities are not very supportive, although visitors from distant places have shown support.

**Recommendations** - Recommendations include

filling staff vacancies, training staff in participatory management, visitor management, and nature interpretation, engaging local people in PA management, coordinating with Haryana to explore the formation of community reserves to secure the ecological corridor from the PA to Sariska TR, and improving water management to protect water bodies from contamination.



Red-whiskered Bulbul © Sankarshan

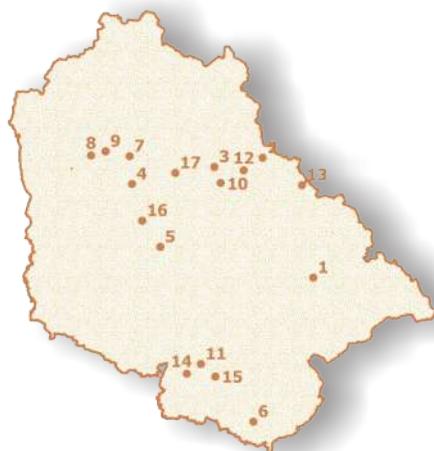
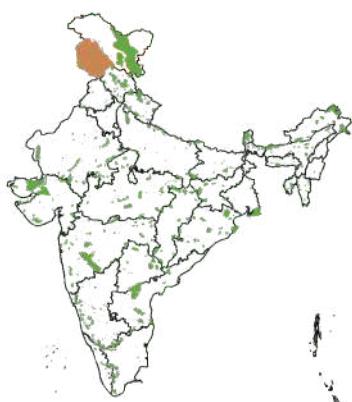
*Trend of MEE scores between first and repeat cycles*

Sl. No	PAs	First Cycle			Repeat Cycle			Trend
		Phase	MEE Score (%)	Category	Evaluation Year	MEE Score (%)	Category	
1	Asola Bhatti WLS	2006-2009	56.8	Fair	2020-2022	65.63	Good	▲



# Jammu & Kashmir

*A scenic view from Katra, Jammu © Deepali Bansal*



## Jammu & Kashmir

Jammu & Kashmir is located in northern India, with a total area of 54,634 Km<sup>2</sup>. The state's forest cover is 21,346.39 Km<sup>2</sup>, accounting for 39.07% of its geographic area (ISFR 2023). In the first cycle of MEE, a total of 14 PAs are assessed. In the repeat cycle, 16 PAs are assessed, of which 3 PAs are new, and 1 PA is excluded, as it was previously evaluated in the first cycle but now falls under a conservation reserve.

### 1. Kishtwar High Altitude NP, Jammu & Kashmir (2018-19):

Kishtwar High Altitude NP was notified in 2012 and extends over an area of approximately 200 Km<sup>2</sup>. Remotely located in the western Himalaya, the PA is home to unique flora and fauna associated with high altitudes, including highly endangered deer species such as the Hangul and Musk Deer. It consists of dense temperate forests, alpine meadows, glacial areas, and snow-fed streams, hosting rare mammals like the Snow Leopard, Himalayan Brown Bear, Asian Black Bear, and Goral, as well as birds such as Monal, Western Tragopan, Golden Eagle, and Snow Partridge. There are no habitations within the PA, and local communities are generally supportive of the management efforts.

However, the sanctuary faces significant challenges, including intense grazing by transhumant and local livestock herders during the summer months. High levels of HWC occur in the zone of influence, and the area struggles with inadequate staff numbers, staff amenities, and protection infrastructure. Additionally, there is insufficient ecological baseline information and a lack of awareness among locals regarding wildlife conservation.

**Recommendations** - Recommendations include expediting the process of settling the rights of local, resource-dependent communities within the PA, issuing the final notification of the PA, finalizing the management plan through stakeholder consultations and securing its approval, providing adequate and timely financial support to properly equip the PA with a sufficient number of personnel, equipment, and infrastructure, offering appropriate compensation to victims of HWC, including for crop damages, and relaxing procedural protocols to facilitate management works, considering the remote location and the limited working period during summer months.

### 2. Baltal-Thajwas WLS, Jammu & Kashmir (2020-22):

The PA, located 21 Km east of Srinagar, covers an area of 219.9 Km<sup>2</sup> and was notified in 1990. It is an important habitat for Musk Deer and is famous for Thajwas glacier. Flanked by the Sonmarg and Sind rivers, the PA provides landscape-level connectivity with the adjoining Dachigam NP and Overa-Aru WLS. It serves as a winter habitat for Snow Leopards and Ibex, and has

high tourism potential, particularly as a base for the Amarnath shrine pilgrimage.

Tourism is managed by the Sonmarg Development Board (SDB), which controls access to certain areas, such as the Thajwas motor road, where PA staff often face restrictions. Revenue from tourism is directed to the SDB and its tour operators. Additionally, there is a temporary village during the summer with heavy grazing by cattle from migrant pastoralists. The PA was carved out of the territorial division in 1982, but the corresponding staff was not transferred, resulting in wage payment disparities among daily wage watchers. Staff also lack adequate winter gear, and the land managed by the SDB is not properly demarcated.

**Recommendations** - Recommendations include resolving territorial issues with the SDB, including enforcement of rental revenue from the PA; ensuring the CWLW's permission for annual snow festivals within the PA; enforcing forest and wildlife laws in the area; improving allowances, facilities, and capacities of field staff; involving local communities in PA management and eco-tourism initiatives; addressing wage payment discrepancies; and conducting periodic population estimations of key species.

### 3. Dachigam NP, Jammu & Kashmir (2020-22):

The PA covers 141 Km<sup>2</sup> and is named after the "ten villages" that were relocated to establish a game reserve in 1910, aimed at supplying drinking water to Srinagar. It was notified as a NP in 1981 and is the only global habitat for the Hangul. The PA is connected to two WLSs, creating a broader conservation area of approximately 500 Km<sup>2</sup>. It received the well-managed NP award in the 1980s. A network of lakes and glaciers within the PA serves as vital water supply sources for downstream villages and Srinagar town. The Sher-e-Kashmir University has a field research station in the PA, where the FD has established a climate change monitoring cell, generating valuable scientific information. An approved management plan is available on the website, but the PA is managed by two separate wildlife divisions.

However, HWC has been reported around the PA, with management problems including staff mobility, challenges with winter patrolling, and an inadequate communication system.

**Recommendations** - Recommendations include making the Hangul Conservation Breeding Centre fully functional, phasing out the animal rescue center,

improving coordination with police, revenue, and territorial administrations, enhancing staff amenities and capacities, creating a Greater Dachigam Landscape by adding Hangul corridors in PAs and nearby habitats, promoting eco-tourism, and extending road connectivity from Pehlipora.

### 4. Gulmarg WLS, Jammu & Kashmir (2020-22):

Gulmarg WLS was notified in 1987 and covers an area of approximately 180 Km<sup>2</sup>. This high-altitude PA provides a suitable habitat and corridor for Markhor, featuring significant faunal and floral assemblages. The sanctuary was separated from the FD in 1982 without a corresponding allocation of staff. It has very high tourism value, with the Gulmarg Development Authority (GDA) and private entrepreneurs managing tourism activities, including pilgrimages.

The management structure in the area is complex, with responsibilities divided among the FD, GDA, and the wildlife department, leading to challenges in coordination. There are no permanent settlements within the PA, but seasonal movements by Bakarwal and Gujjar communities lead to grazing pressure. The boundaries of the PA are porous and unfenced, and staff lack winter gear, wireless communication, and vehicles.

**Recommendations** - Recommendations include transferring management responsibility from the FD to the Wildlife Department, taking action at the highest administrative level; demarcating areas managed by the GDA; ensuring that a portion of the revenue from the cable car operated by the GDA is allocated for PA management; enforcing forest and wildlife regulations on the GDA and private entrepreneurs operating within the PA; reclaiming forest buildings acquired by the district administration at Tangmarg; providing better amenities and allowances for frontline staff; formalizing deputation rules; and repairing and utilizing the abandoned field office at Drang.

### 5. Hirapora WLS, Jammu & Kashmir (2022-23):

Hirapora WLS was notified in 1989 and currently extends over 341 Km<sup>2</sup>. The PA consists of 11 forest compartments, with two compartments still managed by the FD. It features temperate forests and alpine meadows, housing the southernmost population of Markhor, the threatened wild goat, alongside fauna typical of the high-altitude Western Himalayas and their habitats. The PA is contiguous with Tattakutti WLS and serves as the catchment for the two river systems,



the Jhelum and Tawi. There are no villages within the sanctuary, and an ESZ has been notified along with an established management plan.

The sanctuary benefits from a reasonable protection network and effective inter-departmental coordination, particularly with police and revenue departments for PA protection. Local and national academic and conservation organizations assist in management through research, monitoring, and eco-development programs. While the recommendations from earlier MEE have been partially complied with, further improvements are needed to enhance the sanctuary's management and conservation efforts. Traditional migratory pastoralists with about 30,000 sheep and goat use PA resources seasonally. Staff shortage and facilities, especially mobility and trainings, and promotional avenues for wildlife staff compound problems.

**Recommendations** – Recommendations include

getting the final notification of the PA issued; establishing research and monitoring projects on glacial studies, and climate change; rationalizing wildlife administrative structure, including staff promotion in wildlife department; improving overall protection infrastructure, including use of modern technologies; improving inter-departmental coordination.

## **6. Jasrota WLS, Jammu & Kashmir (2022-23):**

Jasrota WLS was notified in 1987 and extends over an area of 10.04 Km<sup>2</sup>, located in the Shivalik range within the north-western Himalayan Biotic Province. The sanctuary does not have any settlements within its boundaries, and an approved management plan is in place, along with a notified ESZ of 12.56 Km<sup>2</sup>. Stakeholders, including the 'Jasrota biradari,' local scientific institutions, and NGOs, are actively involved in the preparation of annual management plans. The



sanctuary has implemented well-planned, decade-long SMC measures and multi-species plantations, with adequate staff and funding, coupled with collaboration from local scientific institutions.

However, the PA is surrounded by eight villages that graze their livestock at the periphery. It experiences periodic gatherings of pilgrims visiting the Kali Mata Mandir, as well as tourists heading to the historical fort and other archaeological monuments located within the PA. The presence of *Lantana* has proliferated, causing management challenges.

**Recommendations** - Recommendations include surveying and demarcating the PA boundaries to facilitate the issuance of a final notification, as well as improving efforts to control the spread of *Lantana* within the sanctuary.

## 7. Kazinag WLS, Jammu & Kashmir (2022-23):

Kazinag WLS was notified in 2011 and spans an area of approximately 178 Km<sup>2</sup>. Predominantly consisting of Himalayan temperate forests, the PA is managed as part of the larger Kazinag landscape, along with three other PAs under one integrated management plan that adopts a landscape approach. The sanctuary is home to several critically important species, including Brown and Black Bears, Markhor, and Musk Deer, and it also supports populations of the endangered Western Tragopan. There are no villages within the PA, and an ESZ has been notified. Populations of key species are monitored with the assistance of WTI, NCF, and Sher-e-Kashmir University.

While there are two villages adjacent to the southern boundary of the PA, traditional summer pastoralists contribute to grazing pressure, and their dogs pose a threat to fawns, cubs, and pheasant eggs. The PA has faced long-standing insurgency issues, resulting in a widespread presence of the Indian Army in the area, which significantly influences staff movement and activities. Additionally, the sanctuary lacks dedicated, permanent staff, as personnel from the other three PAs are rotated periodically for duties in the NP. Protection infrastructure is underdeveloped, and there are limited promotional opportunities for staff.

**Recommendations** - Recommendations include determining the rights of local people and issuing the final notification, completing the survey and demarcation of boundaries, resolving size and extent anomalies concerning Lachipora and Limber WLSs—partner PAs in the landscape—identifying and securing the Markhor corridor to Gulmarg WLS, improving protection infrastructure and staff deployment, enhancing facilities and capacities, ensuring timely release of funds, improving outreach functions of the PA, and introducing climate change studies.

## 8. Lachipora WLS, Jammu & Kashmir (2022-23):

Lachipora WLS was notified in 1978 and renotified in 1987 under WLPA. The PA covers an area of approximately 86.11 Km<sup>2</sup> and represents western Himalayan temperate forests, which support a variety of faunal assemblages, including Markhor, Musk Deer, Goral, and Pheasants. The sanctuary is properly surveyed and demarcated, and an ESZ has been notified. An approved management plan is in place, featuring a scientific database and a landscape approach supported by a GIS-based Atlas. Joint patrolling is conducted with territorial staff and the

forest protection force, alongside protection support from the Indian Army. WTI and NCF are collaborating on various ecological studies.

The sanctuary is administered by the Wildlife Warden of the North Division in Sopore, who also oversees the management of Kazinag NP, Limber WLS, Gulmarg WLS, Naganaraee, and Ajas Conservation Reserves, which span two districts: Baramulla and Bandipora. There are four peripheral villages that rely on the sanctuary for subsistence, leading to conflicts. Additionally, domesticated dogs accompanying graziers pose a threat by preying on fawns, cubs, and pheasant eggs. The PA has faced ongoing insurgency issues, which give armed forces significant control over staff movements and activities. Management challenges include staff shortages, inadequate communication support, lack of funds, and insufficient promotional incentives for staff, along with limited participation from the local community, especially women. Progress on earlier MEE recommendations has been minimal.

**Recommendations** - Recommendations include completing the survey and demarcation of both internal and external boundaries while resolving discrepancies regarding the extent of the PA area, protecting ecological corridors across the Kazinag landscape, strengthening protection infrastructure—including increasing staff numbers and training capacity—improving coordination with security forces, and enhancing the outreach functions of the PA.

## 9. Limber WLS, Jammu & Kashmir (2022-23):

Limber WLS was notified in 1987 and covers an area of approximately 37.31 Km<sup>2</sup>. The PA represents the dry Himalayan temperate forest ecosystem and supports a rich biodiversity. An integrated landscape-scale management plan is in place, which includes PAs and conservation reserves of the Kazinag landscape. The sanctuary is properly surveyed and demarcated, and its management has established several eco-development programs. An ESZ has been notified, and joint patrolling is conducted with territorial staff and the forest protection force, in addition to receiving protection support from the Indian Army. There is strong collaboration with WTI and NCF for ecological studies and baseline data creation.

However, the PA faces significant challenges due to the presence of four villages distributed along the vital Limber Nallah, whose residents have a traditional resource dependence on the area. Other issues include

the proliferation of invasive species, forest fires, mining activities, ongoing insurgency, HWC, and inadequate protection infrastructure. Communication deficiencies, staff shortages, and insufficient funds further complicate management efforts. The Wildlife Warden manages multiple areas under a single administrative control, resulting in inadequate participatory programs.

**Recommendations** - Recommendations include resolving area discrepancies, identifying corridors and areas for conservation within the Kazinag landscape, establishing coordination with the State Disaster Management Authority, improving overall protection infrastructure and staff strength and capacities, securing additional financial resources, and enhancing interpretation and awareness programs along with publicity efforts for the sanctuary.

## 10. Tral WLS, Jammu & Kashmir (2022-23):

The PA, which includes the erstwhile game reserve and consists of Shikargah and Khangund forests, extends over 154.15 Km<sup>2</sup> and was notified in 2019. Additionally, the PA encompasses 113 Km<sup>2</sup> of various forests from the territorial division of Awantipora, which have not yet been formally handed over to PA management. This sanctuary serves as a critical corridor for the movement of Hangul between Dachigam NP and its historical range areas of Shikargah and Overa. There are no villages within the PA, and it benefits from good coordination with the Forest Protection Force, territorial divisions, and security forces. There is an effective presence of anti-poaching camps at Tral and Khangund, along with support from WII, local universities such as SKUAST-K and Kashmir University, and various local NGOs. Regular livestock vaccination efforts and a supportive network of multiple stakeholders also contribute to its strengths.

However, the PA currently lacks a management plan, and an ESZ propoSal has been submitted but not yet approved. The area faces challenges from traditional summer pastoralists and their dogs, rapid land use changes in the vicinity, a widespread presence of armed forces within the PA, and shortages of protection staff, communication equipment, mobility, and high-altitude camping gear.

**Recommendations** - Recommendations include improving protection infrastructure and surveillance, particularly to safeguard Musk Deer and Hangul; getting the ESZ notified; increasing staff numbers, capacities, and allowances; adopting a landscape approach for the conservation of Hangul; conducting

studies on the effects of climate change; ensuring career progression opportunities for officers from assistant Wildlife Wardens; and enhancing inter-sectoral coordination and outreach functions of the PA.

## **11. Nandini WLS, Jammu & Kashmir (2023-24):**

Located close to Jammu city and representing the Shivalik range of the Himalaya, this PA was notified on 10 April 1990 with an area of 33.34 Km<sup>2</sup>, although a recently concluded mapping exercise calculated the area as 19.70 Km<sup>2</sup>. It is surrounded by the territorial forests of Jammu and Reasi divisions, and through tenuous corridors, connected to Ramnagar, Surinsar–Mansar and the former Trikuta WLSs. The river Tawi constitutes its natural boundary to the south-east. The tunnel on NH 44 has freed a significant part of the PA from vehicular traffic. Earthen mounds, reinforced with locally available wood and stones have been constructed for reptiles and other burrowing animals. The animal rescue centre is a good resource for managing HWC.

There are several villages around the PA, with PA-dependent people and livestock. In addition, there are 46 families living within the PA. About 25 nomadic families use the PA in winters for customary livestock grazing. Other major problems include open boundaries at many places, non-settlement of rights of local people, including of the nomadic communities, encroachments, and staff responsibility of handling HWC outside PAs.

**Recommendations-** Recommendations include immediate resolution of area discrepancy, approval of the draft management plan, increase in staff numbers, facilities and deployment, mapping of critical habitats and ecological corridors across the landscape, urgent settlement of rights of local people, improvement of protection infrastructure and staff training, construction of fish ladders over the existing check dams across major streams for facilitating fish spawning, divesting PA staff from HWC management outside PAs, improved research, monitoring and interpretation activities, and integration of forest and wildlife departments.

## **12. Overa-Aru WLS, Jammu & Kashmir (2023-24):**

Located close to the town Pahalgam in Anantnag district and part of the ecologically significant Dachigam–Thajwas–Shikargah landscape, which connects the Greater Himalaya to the Zanskar range,

the PA was notified in 1987 with an area of 425 Km<sup>2</sup>, although a recently concluded mapping exercise calculated the area as 457.38 Km<sup>2</sup>. Famous for its wide valleys, glacial lakes, alpine meadows and temperate broad leaf and coniferous forests, the area forms the catchment of the river Lidder. Home to about 15 mammalian species, including the Hangul, Asiatic Ibex, Serow and Himalayan Black and Brown Bears, and about 120 bird species, the PA, especially the Aru valley, is a famous tourist destination. There are no villages in the PA.

Management challenges associated with the PA include progressive degradation of habitats and biodiversity loss, heavy summer grazing by the livestock of the transhumant communities, potential zoonotic diseases from livestock, annual fires, unregulated tourism in Aru valley, HWC, inadequate PA interpretation and ecological research and monitoring, absence of eco-development and human-resource, technological and financial deficits.

**Recommendations -** Recommendations include resolution of area discrepancy, approval of the draft management plan, notifying proposed ESZ, improved staff training and deployment, mapping of critical habitats and ecological corridors across the landscape, settlement of rights of transhumant communities, divesting PA staff from HWC management outside PAs, improved research and monitoring with assistance from scientific institutions, closer coordination with Anantnag Development Authority and private entrepreneurs for sustainable tourism, formation of EDCs for community-centric eco-tourism, establishing an interpretation centre at Aru, improved awareness and education programmes, and integration of forest and wildlife departments.

## **13. Rajparian Daksum WLS, Jammu & Kashmir (2023-24):**

Rajparian Daksum WLS was notified in 1981 and originally covered an area of 20 Km<sup>2</sup>, although a recent GIS-based mapping has revealed the area to be 48.27 Km<sup>2</sup>. Located in the Anantnag district, the PA forms the upper catchment of the river Jhelum and was previously a hunting reserve for royalty. It is part of the historical range of the critically endangered Hangul and is contiguous with territorial forests along an east-west axis. The sanctuary features temperate broad-leaved and coniferous forests that transition into alpine meadows at elevations above 3,500 meters. These habitats support a diverse range of wildlife, including the Yellow-Throated Marten, Hangul, Kashmir Musk



*A scenic view from Katra, Jammu © Deepali Bansal*

Deer, Himalayan Black and Brown Bears, Leopards, Kashmir Grey Langurs, Golden Eagles, and Bearded Vultures. An approved management plan is currently in place to guide conservation efforts within the sanctuary.

Management problems include acute shortage of field staff and funds, vulnerable Hangul corridors and the Musk Deer population, illegal hunting, grazing by local sheep, nomadic customary summer grazing in the high-altitude meadows, the 1600-acre Government Sheep Farm in the PA and tourism establishments in the vicinity, HWC, absence of landscape-level planning, PA interpretation and ecological research and monitoring, absence of ecodevelopment programmes, and staff shortage and inadequate training of staff.

**Recommendations** - Recommendations include immediate notification of the GIS-based mapped area, landscape level planning, mapping and protection of Hangul corridors, inventory of abandoned/not-in-use buildings of the Sheep Farm and their appropriate use for PA protection, interpretation and eco-tourism, engaging proximate communities as EDCs for PA protection and eco-tourism, removal of fence surrounding the area of the Sheep Farm, improvement in protection infrastructure and of staff number, capacity and amenities, increased financing, upgradation of Foresters' Camp as Range Office, divesting PA staff from HWC management outside PAs, improved research and monitoring, improved inter-departmental coordination for sustainable tourism, and integration of forest and wildlife departments.

#### **14. Ramnagar Rakha WLS, Jammu & Kashmir (2023-24):**

A representative of the Shivalik hills and located adjacent to the river Tawi, the PA sits on the northern side of the city of Jammu. Notified with an extent of 31.5 Km<sup>2</sup> on 10 April 1990, the area is shown as 12.02 Km<sup>2</sup> in a recently concluded GIS mapping exercise. About 23 Km<sup>2</sup> of the notified area is still with the Jammu Forest Division. An IBA site, it protects two Critically Endangered Species of vultures, and has animals like the Himalayan Goral, Nilgai, Barking Deer, Crested Porcupine and leopard. The PA boundaries are properly demarcated and an approved management plan is in place. It also has a Rescue Centre and receives additional funds under Jammu Smart City Project. The PA acts as a green lung for the city of Jammu and is a favourite place for those on holidays and for morning and evening walkers.

Surrounded by a few villages with a human population of about 3000, the PA is also used by migrating herders during winters. NH 44 cuts through the PA for about 7 km. Biotic pressures arise from fodder and firewood collection, heavy grazing during winters, heavy lopping of trees, unregulated movements of morning and evening walkers, clandestine dumping of city waste, and presence of government infrastructure within, including the army. The rights of locals, migrating herders and various institutions located within the PA have not been settled so far. There is a shortage of staff members, and the staff is responsible for HWC management outside the PA too. There are no EDCs.

**Recommendations** - Important recommendations include rectification of area discrepancy, settlement of rights of multiple stakeholders, taking over 23 Km<sup>2</sup> area from the Jammu Forest Division, operationalization of check post at the entrance and regulation of morning and evening walkers, prevention of clandestine dumping of waste in the PA, improvement of protection infrastructure and staff number and capacity, upgradation of interpretation centre and development of interpretative resources along the walkway, improved engagement with multiple stakeholders and improved ecological research, monitoring and outreach programmes.

## 15. Surinsar Mansar WLS, Jammu & Kashmir (2023-24):

Consisting of two ecologically and mythologically significant lakes, namely, the Surinsar and Mansar in the Shivalik hills, the PA was notified with an extent of 97.82 Km<sup>2</sup> in 1990, although a recent GIS-based mapping informs the area to be 62.24 Km<sup>2</sup>. The culturally important lakes are part of the Western Flyway and are notified as Ramsar sites with large numbers of wintering birds, five species of turtle and eight fish species. Dominated by dry deciduous mixed forests, Himalayan sub-tropical scrub forests and Chir Pine mixed forests on the ridges, the PA harbours 16 species of mammal, 121 birds and 17 reptiles. Forming major catchment of the river Tawi, several streams flow through it, supporting a large agriculture-dependent population in and around the PA. There is also a rescue centre and an ESZ, 72.42 Km<sup>2</sup> wide, has been notified in 2022.

The PA experiences huge biotic disturbances due to a large human population and livestock in and around it. About one third of land within the PA is under private ownership. Additionally, the religious significance of the lakes attracts several thousand pilgrims and the pilgrim tourism is managed by the Surinsar-Mansar Development Authority (SMDA). With rights of local people remaining unsettled, the PA is rendered vulnerable to encroachments, illegal tree felling, fishing and poaching. Absence of participatory eco-development and pilgrimage management activities, poor staff strength, underutilization of Rescue Centre as an interpretative resource, absence of fish ladders on check dams across hill streams, and land diversion proposals add to the management challenges.

**Recommendations** - Recommendations include immediate resolution of area discrepancy, approval of the management plan, mapping of critical habitats and

corridors, expediting settlement of rights of the stakeholders, improvement of protection infrastructure, and number and capacity of the staff, establishment of handicap-friendly interpretation centers at Surinsar and Mansar and improvement of education and awareness programmes, engaging local stakeholders in development of participatory eco-development programmes, including pilgrim management, improved coordination with SMDA for sustainable tourism, improved ecological research and monitoring, divesting PA staff of responsibility of managing HWCs outside the PA, construction of fish ladders on check dams for facilitating fish breeding, and as a long-term measure, integration of forest and wildlife departments.

## 16. Tatakutti WLS, Jammu & Kashmir (2023-2024):

Consisting of three old hunting reserves and parts of the Poonch Forest Division, the PA, with an area of 66.27 Km<sup>2</sup> (GIS mapped area is 116.73 Km<sup>2</sup>), came into existence on 30 January 2012 in lieu of the denotified Trikuta WLS. A part of the ecologically significant Kulian-Tatakutti-Hirapora protected landscape, the PA extends to the southern watershed divide of the Pir Panjal range and opens to forest areas of the Kashmir valley towards the north-east. Exhibiting wide altitudinal gradient, the vegetation ranges from secondary scrub forests to Himalayan coniferous and broad-leaved forests, alpine meadows and permanent snowline. There are reports of 16 species of mammal, including the Markhor, Himalayan Brown and Black bears, Kashmir Musk Deer, Goral, Himalayan Red Fox and Leopard, and 121 species of birds, including the Chir Pheasant, Monal, Western Tragopan, Booted Eagle, Golden Eagle and Griffon Vulture. A 124.28 Km<sup>2</sup> wide ESZ was notified on 28 January 2021.

The south-western areas of the PA have seven dhoks (settlements), of which 82 people in four dhoks have been assigned community forest rights under the FRA, 2006. The high-altitude areas are vulnerable to illegal hunting, trespassing, collection of NTFP etc. About 10 Km of the Mughal road, connecting the Jammu region to Kashmir Valley passes through the PA. Being close to the international border, the area has also experienced extremist activities and presently experiences frequent movements of the armed forces. The Budha Amarnath temple, at the fringe of the PA, attracts large numbers of pilgrims. The PA also suffers from vulnerability to encroachment along southern boundary, acute shortage of staff, equipment and funds, protection and interpretation infrastructure, and participatory eco-

development activities.

**Recommendations** - The recommendations include resolution of area discrepancy and notification of correct area, approval of draft management plan, mapping and inventory of ecological corridors in the Kulian-Tatakutti-Hirapora protected landscape, local community engagement for building ecodevelopment

programmes, improvement of the protection infrastructure, and the number, capacities and deployment of the staff, enhanced and timely funding, establishment of an interpretation centre at Rajouri, improved awareness and outreach activities, and closer coordination with security forces for the protection of the PA.

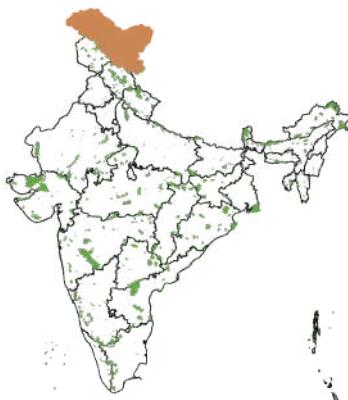
*Trend of MEE scores between first and repeat cycles*

Sl. No	PAs	First Cycle			Repeat Cycle			Trend
		Phase	MEE Score (%)	Category	Evaluation Year	MEE Score (%)	Category	
1	Kishtwar High Altitude NP	2006-2009	47.7	Fair	2018-2019	59.82	Fair	▲
2	Baltal-Thajwas WLS	2017-2018	49.14	Fair	2020-2022	62.5	Good	▲
3	Dachigam NP	2012-2013	55.83	Fair	2020-2022	92.97	Very Good	▲
4	Gulmarg WLS	2015-2017	51.67	Fair	2020-2022	64.84	Good	▲
5	Hirapora WLS	2017-2018	55	Fair	2022-2023	85.94	Very Good	▲
6	Jasrota WLS	2017-2018	70.69	Good	2022-2023	75.78	Very Good	▲
7	Kazinag WLS		-		2022-2023	65.63	Good	-
8	Lachipora WLS	2017-2018	59.17	Fair	2022-2023	60.16	Good	▲
9	Limber WLS	2017-2018	60	Good	2022-2023	61.72	Good	▲
10	Tral WLS	-	-	-	2022-2023	57.81	Fair	-
11	Nandini WLS	2018-2019	54.31	Fair	2023-2024	56.25	Fair	▲
12	Overa-Aru WLS	2018-2019	57.5	Fair	2023-2024	61.72	Good	▲
13	Rajparian (Daksum) WLS	2018-2019	54.17	Fair	2023-2024	57.03	Fair	▲
14	Ramnagar Rakha WLS	2018-2019	57.5	Fair	2023-2024	57.81	Fair	▲
15	Surinsar Mansar WLS	2018-2019	51.67	Fair	2023-2024	60.94	Good	▲
16	Tatakutti WLS	-	-	-	2023-2024	50	Fair	-
17	Hokersar WLS	2017-2018	50.86	Fair	-	Conserva-tion reserve	-	-

# Ladakh

Kiang Herd, Changthang © Arif Ahmad





## Ladakh

Ladakh is located in northern India with the total area of 1,68,327 Km<sup>2</sup>. The state's forest cover is 2,285.92 Km<sup>2</sup>, accounting for 1.36% of its geographic area (ISFR 2023). In the first and repeat cycle of MEE, 3 PAs were assessed.

### 1. Changthang WLS, Ladakh (2020-22):

The PA spans approximately 4,000 Km<sup>2</sup> within the harsh and highly seasonal trans-Himalayan cold desert and was notified in 1987. It is situated between an elevation range of 3,905 to 5,100 meters and features a topography characterized by vast plateaus interspersed with deep gorges. The Indus river flows through the PA, which contains 11 lakes, two of which are designated as Ramsar sites. The renowned Pangong lake, extending almost 150 km and reaching into China, is also located here. The sanctuary is home to the Tibetan Wild Ass and serves as a repository of trans-Himalayan flora and fauna, integrating with the Karakoram WLS and Hemis NP at the landscape level. The PA holds significant cultural and aesthetic values, and while it has a low human density, it experiences high tourism visitation, including from foreign tourists.

However, the PA does not have an approved management plan, and management challenges include an abysmally low strength of field staff, a lack of proper communication and transportation facilities, inaccessibility, poor visitor facilities, and the presence of massive defense establishments that facilitate the movement of personnel and materials. There is also no

contribution from NGOs, and community-centric programs are absent. The local population around Pangong Tso lake has become hostile due to a High Court order in 2018 that mandated the removal of encroachments near the lake.

**Recommendations** - Recommendations include preparing a management plan that incorporates rationalized boundaries, reorganizing administrative units within the PA for effective management, posting the necessary staff and ideally appointing an independent Wildlife Warden for focused attention, establishing a staff training institute instead of relying on sending staff to Jammu and Kashmir, creating an animal rescue center and planning for a zoological park, reinvesting tourism revenue into the establishment of a foundation that serves all PAs in Ladakh, developing eco-development and eco-tourism programs, and improving protection infrastructure and tourism facilities.

### 2. Hemis NP, Ladakh (2020-22):

Hemis NP was notified in 1988 and covers an area of approximately 4,400 Km<sup>2</sup>, making it the largest notified NP in India. The park features a vast and enchanting

landscape with linkages to the Karakoram WLS and Changthang WLS. The terrain consists of a harsh and highly seasonal trans-Himalayan cold desert, characterized by low human density. The local communities are generally supportive of conservation efforts, and Hemis NP is reported to have the highest density of Snow Leopards in the region, contributing to its significant ecological, biological, cultural, and aesthetic values.

However, the PA currently lacks an approved management plan, and its management faces several challenges including an acute shortage of staff, inadequate protection infrastructure, ineffective flow and utilization of funds, the growth of armed forces establishments and their associated movement of personnel and materials, a significant influx of tourists and their support systems, and discrepancies in the reported area size compared to the on-ground reality. Certain localities within the PA are vulnerable to attritionary activities due to remoteness and insufficient staff presence for patrolling. Additionally, there are currently no participatory programs, and retaliatory killings of large mammals have been reported.

**Recommendations** - Recommendations include preparing a management plan that incorporates rationalized boundaries, reorganizing administrative units within the PA for effective management, posting the necessary staff, and improving their capacities and the overall protection infrastructure. Establishing an animal rescue center and a conservation breeding center for endangered species like Chiru and Urial is essential. Additionally, it is important to reinvest tourism revenue back into the PA, establish dialogue with local people following an eco-development approach to mitigate HWC, improve foraging habitats, develop eco-development and eco-tourism programs, and enhance the availability and timely release of funds.

### **3. Karakoram (Nubra Shyok)WLS, Ladakh (2020-22):**

The PA, notified in 1987, spans around 5,000 Km<sup>2</sup> and encompasses the entire catchments of the Nubra and Shyok rivers in Leh district. This trans-Himalayan region forms international boundaries with China and Pakistan along a northeastern crescent, with the Siachin glacier abutting the PA. The enchanting landscape features diverse ecosystems and is noted for its high ecological, biological, cultural, and aesthetic

values. The sighting of Snow Leopards is more frequent here, and Double-humped Camels can be found in the Nubra valley. The area has a low human density, with approximately 50 widely distributed villages, and experiences relatively low-intensity poaching.

However, the PA lacks an approved management plan. Management issues arise from the absence of a full-time Wildlife Warden, an acute shortage of staff, inadequate protection infrastructure, and insufficient flow and utilization of funds. The growth of armed forces establishments and the associated movement of personnel and materials, along with the presence of defense aircraft landing stations, further complicate management efforts. There is also a significant influx of tourists and related support systems, and discrepancies in the reported area size do not align with the actual ground reality. Certain localities within the PA are vulnerable to attrition due to their remoteness and the lack of staff for patrolling. During the summer months, grazing pressure, medicinal plant collection, and resource use by pastoralists and resident villagers pose management challenges. Moreover, there is currently no participatory program, interpretation center, or adequate visitor facilities.

**Recommendations** - Recommendations include preparing a management plan that incorporates rationalized boundaries, reorganizing the administrative units within the PA for effective management, and posting necessary staff, including a full-time Wildlife Warden. It is essential to improve the capacities of staff and enhance overall protection infrastructure. Funding from tourism revenue should be reinvested into the PA, and establishing dialogue with local communities following an eco-development approach will help mitigate HWC and improve livelihoods. Additional recommendations include improving foraging habitats, developing eco-development and eco-tourism programs with community-based organizations, enhancing information dissemination, interpretation, and publicity regarding the PA, ensuring better fund availability and timely release, and improving inter-departmental coordination, including collaboration with the armed forces.



Snow Partridge © Vivek Sarkar

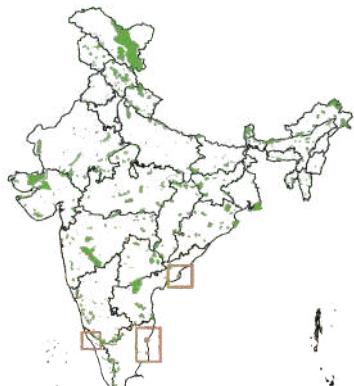
Trend of MEE scores between first and repeat cycles

Sl. No	PAs	First Cycle			Repeat Cycle			Trend
		Phase	MEE Score (%)	Category	Evaluation Year	MEE Score (%)	Category	
1	Changthang WLS	2006-2009	47.7	Fair	2020-2022	37.5	Poor	▼
2	Hemis NP	2009-2010	54.69	Fair	2020-2022	30.47	Poor	▼
3	Karakoram (Nubra Shyok) WLS	2015-2017	60.83	Good	2020-2022	36.72	Poor	▼

Puducherry

Little Stint © Rajdeep Mitra





# Puducherry



Puducherry is located in southern India with the total area of 490 Km<sup>2</sup>. The state's forest cover is 44.31 Km<sup>2</sup>, accounting for 9.04% of its geographic area (ISFR 2023). In the first and repeat cycle of MEE, 1 PA was assessed.

## 1. Oussudu WLS, Puducherry (2020-22):

The PA was notified in 2006 and covers an area of approximately 7.93 Km<sup>2</sup>. The PA is a water body that spans across Puducherry and Tamil Nadu. Located near the capital of the Union Territory, it is a highly visited site, particularly during the winter bird season. The Tamil Nadu side also serves as a sanctuary, and an interpretation center was recently opened. Joint patrolling is conducted by both sides, supported by effective outreach work and local community backing. Regulated fishing practices by the local fishermen community are in place, and there is a strong scientific baseline established for bird populations.

Despite these positive aspects, the Puducherry side of the PA lacks permanent staff for management, relying

instead on temporary staff, mostly on daily wages. Potential threats to the area include the inflow of effluents, dumping of solid waste, illegal tree cutting, and hunting of birds. The PA is challenged by poor investment in protection infrastructure, non-uniformed staff, limited mobility, and inadequate village eco-development programs.

**Recommendations** - Recommendations include establishing a regular team of uniformed staff for better protection, replacing or maintaining patrolling boats to reduce dependency on the tourism department in emergencies, increasing funding for effective management, and preventing sewage inflow into the water body.

*Trend of MEE scores between first and repeat cycles*

Sl. No	PAs	First Cycle			Repeat Cycle			Trend
		Evaluation Year	MEE Score (%)	Category	Evaluation Year	MEE Score (%)	Category	
1	Oussudu WLS	2012-2013	55	Fair	2020-2022	66.41	Good	▲

way Toward



Spot-winged Starling © Vivek Sarkar

# WAY FORWARD

**The Kunming-Montreal Global Biodiversity Framework (KMGBF)**, adopted in December 2022, outlines **23 targets** aimed at reversing biodiversity loss, securing sustainable funding, and strengthening conservation efforts. A key commitment, **Target 3 ("30x30")**, calls for **30% of the world's terrestrial, inland water, coastal, and marine areas** to be **effectively protected and managed** by 2030. The **Management Effectiveness Evaluation (MEE) of National Parks and Wildlife Sanctuaries (NPs & WLS)** plays a crucial role in ensuring that India's protected areas contribute meaningfully to this global goal.

The present **MEE process** has provided significant insights into the management practices of Protected Areas (PAs), highlighting strengths, identifying gaps, and recommending actionable points for improvement. To further enhance conservation outcomes, the following steps must be prioritized:

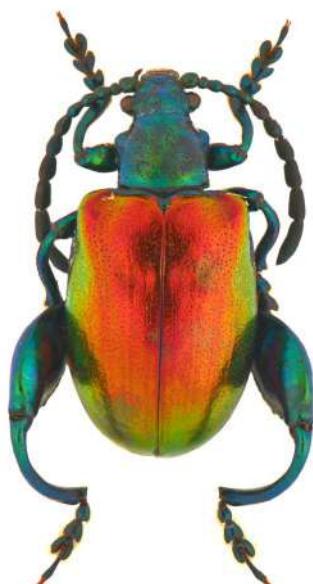
- Institutionalizing MEE as a Recurring Process –** Rather than being conducted in a project-based mode, **MEE should be institutionalized as a Centrally Sponsored Schemes repeating every five years**. This will enable consistent and systematic evaluation of management effectiveness.

The **Ministry of Environment, Forest & Climate Change (MoEF&CC)** must allocate **adequate financial resources** and establish a structured **compliance monitoring mechanism** to track implementation of MEE actionable points effectively.

- Incorporating Best Practices–** Evaluation teams should **document best practices** if any observed during the assessment. This will facilitate knowledge-sharing and replication of successful conservation models across protected areas.
- Monitoring Mechanism for Actionable Points –** A structured monitoring system should be established to track the implementation of recommendations provided by the **MEE evaluation teams**.
- Strengthening Science-Based Management**

**Plans –** For MEE to be successful, each NP and WLS must develop a management plan that is **scientifically robust**, data driven, **administratively feasible and based on MoEFCC's management code**, **National Biodiversity Strategy and Action Plan (NBSAP)**, **National Wildlife Action Plan (NWAP)** and **MEE recommendations**.

- MEE for Conservation & Community Reserves –** At present, separate MEEs are carried out for TR, ER, Zoos NP & WLS, similarly, given their unique management challenges and governance structures, a **committee should be formed to develop evaluation framework for Conservation Reserves and Community Reserves**. Management planning exercise has to be initiated.
- IUCN Green Listing and MEE** - The MEE process assesses the management practices of protected areas, identifying strengths and areas for improvement. By incorporating the best practices and recommendations from MEE, Indian PAs can align themselves with the standards of the IUCN Green List, showcasing their commitment to effective and equitable management. This alignment will not only enhance the visibility of India's conservation efforts but also inspire continuous improvement in governance.



*Frog-legged Beetle (Sagra sp.) © Ritesh Kumar Gautam*

# REFERENCE

1. Hockings M. 2003. Systems for Assessing the Effectiveness of Management in PAs. *Bioscience* 53(9): 823-833
2. Hockings, M., James, R., Stolton, S., Dudley, N., Mathur, V., Makombo, J., Courrau, J., Parrish, J., & Patry, M. 2008. Enhancing Our Heritage Toolkit: Assessing Management Effectiveness of Natural World Heritage Sites. *World Heritage Paper* 23. Paris: UNESCO World Heritage Centre.
3. IPBES 2019. Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. Brondizio, E.S., Settele, J., Díaz, S. and Ngo, H.T. (Eds.). *IPBES secretariat*, Bonn.
4. Jepson P, Momberg F, van Noord H. 2002. A review of the efficacy of the PA system of East Kalimantan Province, Indonesia. *Natural Areas Journal* 22: 28–42.
5. Margules CR, Pressey RL. 2000. Systematic conservation planning. *Nature* 405: 243–253.
6. Mathur V.B., N.A. Ansari, M. Onial 2019. PAs Management in India: Challenges and Way Ahead. *The Journal of Governance* 18: 87-96. Published by IC Centre for Governance, New Delhi
7. Stoll-Kleemann S. 2010. Evaluation of management effectiveness in PAs: Methodologies and results. *Invited views in Basic and Applied Ecology*. 11 :377-382. doi:10.1016/j.baee.2010.06.004
8. UNEP-WCMC and IUCN. 2021. Protected Planet Report 2020. UNEP-WCMC and IUCN: Cambridge UK; Gland, Switzerland. <https://livereport.protectedplanet.net/>
9. Ministry of Environment, Forest and Climate Change. (2023, November 30). *Guidelines for the process of management planning for Protected Areas (PAs) and other landscape elements as per Section 33 of the Wild Life (Protection) Act, 1972*. Government of India.



Beautiful Nuthatch ©Rajdeep Mitra

## ANNEXURE-I

S. No.	MEE Team (Chairman & Members)	State	Name of PA	Year
<b>Pilot Phase (2018-2019)</b>				
1	<b>Dr. S.K. Khanduri</b>  Dr. E.A Jayson, Dr. Arun Mani Dixit, Shri Vinod D.K.	Andhra Pradesh	Papikonda NP	2018-2019
2	<b>Dr. Pradeep Vyas</b>	Arunachal Pradesh	Sessa Orchid WLS	2018-2019
3	Dr. Umesh Kumar Tiwari, Dr. Bibhuti Lahkar, Dr. Bivash Pandav	Assam	Pobitora WLS	2018-2019
4	<b>Shri Rajiv Kumar Srivastava,</b>  Dr. Ashish David, Dr. Nita Shah, Dr. Gautam Talukdar	Gujarat	Barda WLS	2018-2019
5	<b>Shri B.S. Bonal</b>	Haryana	Sultanpur NP	2018-2019
6	Dr. Khurshid Ahmad, Dr. Justus Joshua Dr. S. Sathyakumar	Himachal Pradesh	Great Himalayan NP	2018-2019
7	<b>Dr. V.K. Melkani</b>  Dr. Vibhu Prakash, Dr. Jeet Ram, Dr. K. Sivakumar	Jammu & Kashmir	Kishtwar High Altitude NP	2018-2019
8	<b>Dr. A.K. Bhardwaj</b>	Jharkhand	Mahuadanr Wolf WLS	2018-2019
9	Dr. Ram Kumar, Dr. Udayan Borthakur,	Odisha	Sunabeda WLS	2018-2019
10	Dr. B.S. Adhikari		Bhitarkanika NP & WLS	2018-2019
11	<b>Shri P. Anur Reddy</b>  Dr. S. Narendra Prasad, Shri B.C. Choudhury, Dr. Abhijit Das	Kerala	Wayanad WLS	2018-2019
12	<b>Dr. Alok Saxena</b>	Madhya Pradesh	Kuno WLS	2018-2019
13	Dr. Jayant Kulkarni, Shri Ajay Desai, Dr. Suresh Kumar		Madhav NP	2018-2019
14	<b>Shri U.M. Sahai</b>  Dr. Advait Edgoankar, Ms. Seema Bhatt, Dr. S.P. Goyal	Maharashtra	Sanjay Gandhi (Borivilli) NP	2018-2019
15	<b>Shri T.T.C. Marak</b>	Manipur	Keibul-Lamjao NP	2018-2019
16	Dr. B.K. Mishra, Dr. Yogesh Dubey,	Meghalaya	Nongkhyllem WLS	2018-2019
17	Shri Salvador Lyngdoh		Khangchendzonga NP	2018-2019
18		Tripura	Sepahijala WLS & Clouded Leopard NP	2018-2019
19	<b>Shri V. Gopinath</b>  Shri Roy P. Thomas, Dr. Manisha Thapliyal, Dr. Manoj Nair	Rajasthan	Keoladeo Ghana NP	2018-2019
20	<b>Shri B.K. Singh</b>  Dr. Lalit Kumar Sharma, Dr. P.S. Easa, Dr. Asha Rajvanshi	Tamil Nadu	Gulf of Mannar Marine NP	2018-2019
21	<b>Dr. Anmol Kumar</b>	Uttar Pradesh	National Chambal WLS	2018-2019
22	Dr. Dipankar Ghose	Uttar Pradesh	Sohelwa WLS	2018-2019
23	Dr. Rathin Barman, Shri Ajay Srivastav	Uttarakhand	Govind NP & Govind Pashu Vihar WLS	2018-2019

S. No.	MEE Team (Chairman & Members)	State	Name of PA	Year
24	<b>Shri Azam Zaidi</b>	West Bengal	Mahananda WLS	2018-2019
25	Shri P. Krishna Mohan, Dr. Diwakar Sharma Dr. Bilal Habib		Jaldapara WLS	2018-2019
<b>Phase I (2020-2022)</b>				
26	<b>Shri B.S. Bonal</b>	Chandigarh	Sukhna Lake WLS	2020-2022
27	Dr. Khurshid Ahmad	Chandigarh	City Bird WLS	2020-2022
28	Dr. Justus Joshua	Delhi	Asola Bhatti WLS	2020-2022
29	Amit Kumar	Haryana	Kalesar NP & WLS	2020-2022
30		Haryana	Bhindawas Lake WLS	2020-2022
31		Haryana	Chhilchhila Lake WLS	2020-2022
32		Haryana	Khol-Hi-Raitan (Morni Hills) WLS	2020-2022
33		Jammu & Kashmir	Changthang WLS	2020-2022
34		Jammu & Kashmir	Hemis NP	2020-2022
35		Jammu & Kashmir	Dachigam NP	2020-2022
36		Jammu & Kashmir	Gulmarg WLS	2020-2022
37		Jammu & Kashmir	Karakoram (NubraShyok) WLS	2020-2022
38		Jammu & Kashmir	Thajwas (Baltal) WLS	2020-2022
39	<b>Shri Rajiv Kumar Srivastav</b>	Himachal Pradesh	Kibber WLS	2020-2022
40	Dr. Anil Rathi	Himachal Pradesh	Pin Valley NP	2020-2022
41	Dr. S.K. Singh	Himachal Pradesh	Rupi Bhaba WLS	2020-2022
42	Dr. Amit Kumar	Himachal Pradesh	Simbalbara NP	2020-2022
43		Himachal Pradesh	Manali WLS	2020-2022
44		Himachal Pradesh	Pong Dam WLS	2020-2022
45		Himachal Pradesh	Shimla Water Catchment WLS	2020-2022
46		Himachal Pradesh	Bandli WLS	2020-2022
47		Himachal Pradesh	Chail WLS	2020-2022
48		Himachal Pradesh	Chandratal WLS	2020-2022
49	<b>Shri V.K. Uniyal</b>	Himachal Pradesh	Churdhar WLS	2020-2022
50	Dr. Rahul Mungikar	Himachal Pradesh	Daranghati WLS	2020-2022
51	Dr. Gaurav Sharma	Himachal Pradesh	Dhauladhar WLS	2020-2022
52	Dr. Gautam Talukdar/ Dr. Monali Sen	Himachal Pradesh	GamgulSiyabehi WLS	2020-2022
53		Himachal Pradesh	Kais WLS	2020-2022
54		Himachal Pradesh	Kalatop-Khajjiar WLS	2020-2022
55		Himachal Pradesh	Kanawar WLS	2020-2022
56		Himachal Pradesh	Khokhan WLS	2020-2022
57		Punjab	Abohar WLS	2020-2022
58		Punjab	Harike Lake WLS	2020-2022
59		Punjab	Bir Bhadson WLS	2020-2022
60	<b>Shri Pradeep Shukla</b>	Uttar Pradesh	Kaimur WLS	2020-2022
61	Dr. Dipankar Ghose	Uttar Pradesh	Sohagibarwa WLS	2020-2022
62	Dr. Rathin Barman	Uttar Pradesh	Okhala WLS	2020-2022

S. No.	MEE Team (Chairman & Members)	State	Name of PA	Year
63	Dr. Sandeep Gupta	Uttar Pradesh	Sur Sarovar Bird WLS	2020-2022
64		Uttar Pradesh	Chandraprabha WLS	2020-2022
65		Uttar Pradesh	Hastinapur WLS	2020-2022
66		Uttar Pradesh	Shekha Bird WLS	2020-2022
67		Uttarakhand	Nanda Devi NP	2020-2022
68		Uttarakhand	Gangotri NP	2020-2022
69		Uttarakhand	Kedarnath Musk Deer WLS	2020-2022
70		Uttarakhand	Binsar WLS	2020-2022
71		Uttarakhand	Askot Musk Deer WLS	2020-2022
72	<b>Shri S.S. Srivastva</b>	Karnataka	Mookambika WLS	2020-2022
73	Dr. D.S. Shrivastava	Karnataka	Kudremukh NP	2020-2022
74	Dr. Afifullah Khan	Karnataka	Gudavi Bird WLS	2020-2022
75	Dr. Navendu Page	Karnataka	Bhimgad WLS	2020-2022
76		Karnataka	Jogimatti WLS	2020-2022
77		Karnataka	Yadahalli Chinkara WLS	2020-2022
78	<b>Shri Azam Zaidi</b>	Goa	Mollem NP	2020-2022
79	Dr. Lalit Kumar Sharma	Goa	Bhagwan Mahavir WLS	2020-2022
80	Dr. G. Areendran	Goa	Bondla WLS	2020-2022
81	Dr. Gautam Talukdar/ Dr. Monali Sen	Goa	Dr. Salim Ali Bird (Chorao) WLS	2020-2022
82	<b>Shri B.K. Singh</b>	Puducherry	Oussudu WLS	2020-2022
83	Dr. P.K. Mathur	Tamil Nadu	Mukurthi NP	2020-2022
84	Dr. P.S. Easa	Tamil Nadu	Point Calimere WLS	2020-2022
85	Dr. C. Ramesh	Tamil Nadu	Srivilliputhur Grizzled Squirrel WLS	2020-2022
86		Tamil Nadu	Pulicat Lake Bird WLS	2020-2022
87		Tamil Nadu	Kanyakumari WLS	2020-2022
88		Telangana	Manjeera Crocodile WLS	2020-2022
89		Telangana	Mahaveer Harina Vanasthalı NP	2020-2022
90		Telangana	Pakhal WLS	2020-2022
91	<b>Shri Kirti Singh</b>	Bihar	Kaimur WLS	2020-2022
92	Shri P. Krishna Mohan	Bihar	Kanwar Jheel Bird WLS	2020-2022
93	Dr. Diwakar Sharma	Bihar	Nakti Dam WLS	2020-2022
94	Dr. Gopi G.V.	Bihar	Vikramshila Gangetic Dolphin WLS	2020-2022
95		Bihar	Gautam Buddha WLS	2020-2022
96		Bihar	Kusheshwarasthan Bird WLS	2020-2022
97		Bihar	Bhimbandh WLS	2020-2022
98		Bihar	Nagi Dam WLS	2020-2022
99	<b>Shri Hari Kumar</b>	Chhattisgarh	Semarsot WLS	2020-2022
100	Dr. S.F. Wesley Sunderraj	Chhattisgarh	Barnawapara WLS	2020-2022
101	Dr. Parikshit Gautam	Chhattisgarh	Guru Ghasidas (Sanjay) NP	2020-2022
102	Dr. Gopi G.V.	Chhattisgarh	Kanger Valley NP	2020-2022
103		Chhattisgarh	Badalkhol WLS	2020-2022

S. No.	MEE Team (Chairman & Members)	State	Name of PA	Year
104		Chhattisgarh	Tamor Pingla WLS	2020-2022
105		Chhattisgarh	Bhairamgarh WLS	2020-2022
106		Chhattisgarh	Bhoramdev WLS	2020-2022
107		Jharkhand	Dalma WLS	2020-2022
108		Jharkhand	Hazaribagh WLS	2020-2022
109		Jharkhand	Kodarma WLS	2020-2022
110	<b>Dr. V.K. Melkani</b>	Jharkhand	Udhwa Lake Bird WLS	2020-2022
111	Dr. Vibhu Prakash	Jharkhand	Palkot WLS	2020-2022
112	Dr. Jeet Ram	Odisha	Gahirmatha WLS	2020-2022
113	Dr. Abhijit Das	Odisha	Chandaka-Dampara WLS	2020-2022
114		Odisha	Chilika (Nalaban) WLS	2020-2022
115		Odisha	Hadgarh WLS	2020-2022
116		Odisha	Debrigarh WLS	2020-2022
117		Odisha	Kothagarh WLS	2020-2022
118		Odisha	Lakhari Valley WLS	2020-2022
119		Odisha	Kapilash WLS	2020-2022
120	<b>Shri N.K. Vasu</b>	West Bengal	Gorumara NP	2020-2022
121	Dr. Ashish David	West Bengal	Singalila NP	2020-2022
122	Dr. Nita Shah	West Bengal	Neora Valley NP	2020-2022
123	Dr. Abhijit Das	West Bengal	Chapramari WLS	2020-2022
124		West Bengal	Senchal WLS	2020-2022
125	<b>Shri P. Anur Reddy</b>	Dadra & Nagar Haveli	Dadra & Nagar Haveli WLS	2020-2022
126	Dr. S. Narendra Prasad	Daman & Diu	Fudam WLS	2020-2022
127	Shri B.C. Choudhury	Gujarat	Gir NP & WLS	2020-2022
128	Dr. R. Suresh Kumar	Gujarat	Marine (Gulf of Kutch) NP & WLS	2020-2022
129		Gujarat	Wild Ass WLS	2020-2022
130		Gujarat	Velavadar (Blackbuck) NP	2020-2022
131		Gujarat	Shoolpaneswar (Dhumkhal) WLS	2020-2022
132		Gujarat	Purna WLS	2020-2022
133		Gujarat	Khijadiya WLS	2020-2022
134		Gujarat	Nal Sarovar Bird WLS	2020-2022
135	<b>Dr. Alok Saxena</b>	Gujarat	Bansda NP	2020-2022
136	Dr. Jayant Kulkarni	Gujarat	Balaram Ambaji WLS	2020-2022
137	Dr. Aishwarya Maheshwary	Gujarat	Jambughoda WLS	2020-2022
138	Dr. R. Suresh Kumar	Gujarat	Jessore Sloth Bear WLS	2020-2022
139		Gujarat	Kachchh (Lala) Great Indian Bustard WLS	2020-2022
140		Gujarat	Kachchh Desert WLS	2020-2022
141	<b>Dr. Pradeep Vyas</b>	Madhya Pradesh	Ratapani WLS	2020-2022
142	Dr. Umesh Kumar	Madhya Pradesh	Nauradehi WLS	2020-2022
143	Dr. Bibhuti Lahkar	Madhya Pradesh	Ken Gharial WLS	2020-2022

S. No.	MEE Team (Chairman & Members)	State	Name of PA	Year
144	Dr. Navendu Page	Madhya Pradesh	Bagdara WLS	2020-2022
145		Madhya Pradesh	Ghatigaon WLS	2020-2022
146		Madhya Pradesh	Dinosaur Fossil NP	2020-2022
147		Rajasthan	Desert NP	2020-2022
148		Rajasthan	Kumbhalgarh WLS	2020-2022
149		Rajasthan	Sitamata WLS	2020-2022
150		Rajasthan	Mount Abu WLS	2020-2022
151		Rajasthan	Bhensrodgarh WLS	2020-2022
152	<b>Ms. Shruti Sharma</b>	Maharashtra	Bhimashankar WLS	2020-2022
153	Shri Roy P. Thomas	Maharashtra	Chaprala WLS	2020-2022
154	Dr. Manisha Thapliyal	Maharashtra	Great Indian Bustard WLS	2020-2022
155	Dr. Sandeep Gupta	Maharashtra	Karnala Bird WLS	2020-2022
156		Maharashtra	Phansad WLS	2020-2022
157		Maharashtra	Dhyanganga WLS	2020-2022
158		Maharashtra	Tansa WLS	2020-2022
159		Maharashtra	Ghodazari WLS	2020-2022
160		Maharashtra	New Maldhok Bird (Gangewadi) WLS	2020-2022
161		Maharashtra	Pranhita WLS	2020-2022
162		Maharashtra	Sudhagad WLS	2020-2022
163		Maharashtra	Tamhini WLS	2020-2022
164	<b>Shri T.T.C. Marak</b>	Assam	Amchang WLS	2020-2022
165	Dr. Sumit Dookia	Assam	Deepor Beel WLS	2020-2022
166	Dr. Yogesh Dubey	Assam	Sonai Rupai WLS	2020-2022
167	Dr. Lallianpui Kawlvi	Assam	Chakrasila WLS	2020-2022
168		Assam	East Karbi Anglong WLS	2020-2022
169		Assam	Garampani WLS	2020-2022
170	<b>Shri R.N. Mehrotra</b>	Meghalaya	Balphakram NP	2020-2022
171	Dr. G.S. Rawat	Meghalaya	Nokrek Ridge NP	2020-2022
172	Dr. N. Odyou	Meghalaya	Siju WLS	2020-2022
173	Sh. Salvador Lyngdoh	Meghalaya	Narpuh WLS	2020-2022
174	<b>Dr. A.K. Gupta</b>	Manipur	Yangoupokpi Lokchao WLS	2020-2022
175	Dr. Narendra Sharma	Nagaland	Intanki NP	2020-2022
176	Dr. Faiyyaz Khudsar	Nagaland	Fakim WLS	2020-2022
	Dr. Lallianpui Kawlvi			
177	<b>Shri U.M. Sahai</b>	Sikkim	Barsey Rhododendron WLS	2020-2022
178	Dr. Advait Edgoankar	Sikkim	Pangolakha WLS	2020-2022
179	Ms. Seema Bhatt	Sikkim	FambongLho WLS	2020-2022
180	Dr. Salvador Lyngdoh	Sikkim	Maenam WLS	2020-2022
181		Sikkim	Kyongnosla Alpine WLS	2020-2022
<b>Phase II (2022-2023)</b>				
182	<b>Shri Sanjaya Singh</b>	Jammu & Kashmir	Hirapora WLS	2022-2023

S. No.	MEE Team (Chairman & Members)	State	Name of PA	Year
183	Dr. Khurshid Ahmad	Jammu & Kashmir	Jasrota WLS	2022-2023
184	Dr. P.K. Mathur	Jammu & Kashmir	Lachipora WLS	2022-2023
185	Dr. V.P. Uniyal	Jammu & Kashmir	Limber WLS	2022-2023
186		Jammu & Kashmir	Tral WLS	2022-2023
187		Jammu & Kashmir	Kazinag NP	2022-2023
188	<b>Shri R.N. Mehrotra</b>	Punjab	Bir Aishvan WLS	2022-2023
189	Dr. G.S. Rawat	Punjab	Bir Bunerheri WLS	2022-2023
190	Dr. Anil Kumar	Punjab	Bir Dosanjh WLS	2022-2023
191	Dr. Malvika Onial	Punjab	Bir Gurdialpura WLS	2022-2023
192		Punjab	Bir Mehaswala WLS	2022-2023
193		Uttarakhand	Mussoorie WLS	2022-2023
194		Uttarakhand	Valley of Flowers NP	2022-2023
195	<b>Shri Rajashekhar Narla</b>	Uttar Pradesh	Bakhira WLS	2022-2023
196	Dr. Faiyyaz Khudsar	Uttar Pradesh	Lakh Bahosi Bird WLS	2022-2023
197	Dr. Sumit Dookia	Uttar Pradesh	Mahavir Swami WLS	2022-2023
198	Dr. Sandeep Gupta	Uttar Pradesh	Nawabganj Bird WLS	2022-2023
199		Uttar Pradesh	Parvati Aranga WLS	2022-2023
200		Uttar Pradesh	Patna WLS	2022-2023
201	<b>Shri Pradeep Shukla</b>	Andhra Pradesh	Kambalakonda WLS	2022-2023
202	Dr. Dipankar Ghose	Andhra Pradesh	Kolleru WLS	2022-2023
203	Dr. Rathin Barman	Andhra Pradesh	Koundinya WLS	2022-2023
204	Dr. B.S. Adhikari	Andhra Pradesh	Rajiv Gandhi (Rameswaram) NP	2022-2023
205		Andhra Pradesh	Sri Penusila Narasimha WLS	2022-2023
206		Andhra Pradesh	Sri Venkateswara NP	2022-2023
207	<b>Dr. S.K. Khanduri</b>	Karnataka	Adichunchunagiri Peacock WLS	2022-2023
208	Dr. E.A Jayson	Karnataka	Arabithittu WLS	2022-2023
209	Dr. Arun Mani Dixit	Karnataka	Malai Mahadeshwara WLS	2022-2023
210	Dr. S. Sathyakumar	Karnataka	Bannerghatta NP	2022-2023
211		Karnataka	Brahmagiri WLS	2022-2023
212		Karnataka	Melkote Temple WLS	2022-2023
213		Karnataka	Cauvery WLS	2022-2023
214		Karnataka	Kamasandra WLS	2022-2023
215	<b>Dr. A.K. Gupta</b>	Karnataka	Daroji Sloth Bear WLS	2022-2023
216	Dr. Narendra Sharma	Karnataka	Ghataprabha Bird WLS	2022-2023
217	Dr. Afifullah Khan	Karnataka	Gudekote Sloth Bear WLS	2022-2023
218	Dr. V.P. Uniyal	Karnataka	Attiveri Bird WLS	2022-2023
219		Karnataka	Kappathagudda WLS	2022-2023
220		Karnataka	Bukkapatna Chinkara WLS	2022-2023
221		Karnataka	Chincholi WLS	2022-2023
222		Karnataka	Thimlapura WLS	2022-2023
223	<b>Shri Sanjai Mohan</b>	Kerala	Aralam WLS	2022-2023

S. No.	MEE Team (Chairman & Members)	State	Name of PA	Year
224	Dr. Ashish David	Kerala	Silent Valley NP	2022-2023
225	Dr. Nita Shah	Kerala	Malabar WLS	2022-2023
226	Dr. Navendu Page	Kerala	Karimpuzha WLS	2022-2023
227		Kerala	Chimmony WLS	2022-2023
228		Kerala	Chinnar WLS	2022-2023
229		Kerala	Mathikettan Shola NP	2022-2023
230	<b>Shri S.V. Kumar</b>	Kerala	Idukki WLS	2022-2023
231	Dr. Jyoti Kashyap	Kerala	Eravikulam NP	2022-2023
232	Dr. G. Areendran	Kerala	Anamudi Shola NP	2022-2023
233	Dr. J.A. Johnson	Kerala	Pambadum Shola NP	2022-2023
234		Kerala	Peppara WLS	2022-2023
235		Kerala	Shendurney WLS	2022-2023
236		Kerala	Chulanur Peafowl WLS	2022-2023
237	<b>Shri Kirti Singh</b>	Tamil Nadu	Cauvery North WLS	2022-2023
238	Shri P. Krishna Mohan	Tamil Nadu	Chitrangudi Bird WLS	2022-2023
239	Dr. Diwakar Sharma	Tamil Nadu	GangaiKondam Spotted Dear WLS	2022-2023
240	Dr. C Ramesh	Tamil Nadu	Guindy NP	2022-2023
241		Tamil Nadu	Kanjirankulam Bird WLS	2022-2023
242		Tamil Nadu	Karaivetti Bird WLS	2022-2023
243		Tamil Nadu	Karikilli Bird WLS	2022-2023
244		Tamil Nadu	Kodaikanal WLS	2022-2023
245		Tamil Nadu	Koonthankulam-Kadankulam WLS	2022-2023
246		Tamil Nadu	Melaselvanoor-Keelaselvanoor WLS	2022-2023
247	<b>Shri P. Sridhar</b>	Telangana	Eturnagaram WLS	2022-2023
248	Dr. S.F. Wesley Sunderraj	Telangana	Kasu Brahmananda Reddy NP	2022-2023
249	Dr. Parikshit Gautam	Telangana	Kinnersani WLS	2022-2023
250	Dr. C. Ramesh	Telangana	Mrugavani NP	2022-2023
251		Goa	Cotigao WLS	2022-2023
252		Goa	Netravali WLS	2022-2023
253	<b>Shri Sanjay Shrivastav</b>	Bihar	Barela Jheel Salim Ali Bird WLS	2022-2023
254	Dr. Vibhu Prakash	Bihar	Pant (Rajgir) WLS	2022-2023
255	Dr. Jeet Ram	Bihar	Udaipur WLS	2022-2023
256	Dr. Amit Kumar	Jharkhand	Gautam Buddha WLS	2022-2023
257		Jharkhand	Lawalong WLS	2022-2023
258		Jharkhand	Parasnath WLS	2022-2023
259		Jharkhand	Topchanchi WLS	2022-2023
260	<b>Shri Surya Prakash</b>	Odisha	Badrama WLS	2022-2023
261	Dr. Umesh Kumar	Odisha	Karlapat WLS	2022-2023
262	Dr. Monalisa Sen	West Bengal	Ballavpur WLS	2022-2023
263	Dr. Samrat Mondol	West Bengal	Bethuadahari WLS	2022-2023
264		West Bengal	Bibhuti Bhusan WLS	2022-2023

S. No.	MEE Team (Chairman & Members)	State	Name of PA	Year
265		West Bengal	Chintamani Kar Bird WLS	2022-2023
266		West Bengal	Pakhi Bitan Bird WLS	2022-2023
267	<b>Ms. Shruti Sharma</b>	Madhya Pradesh	Fossil NP	2022-2023
268	Dr. P.S. Easa	Madhya Pradesh	Gandhi Sagar WLS	2022-2023
269	Dr. Abhishek Bhatnagar	Madhya Pradesh	Kheoni WLS	2022-2023
270	Dr. Sutirtha Dutta	Madhya Pradesh	Narsighgarh WLS	2022-2023
271		Madhya Pradesh	National Chambal WLS	2022-2023
272		Madhya Pradesh	Orcha WLS	2022-2023
273		Madhya Pradesh	Van Vihar NP	2022-2023
274	<b>Dr. H.S. Singh</b>	Maharashtra	Aner Dam WLS	2022-2023
275	Dr. S.K. Singh	Maharashtra	Bhamragarh WLS	2022-2023
276	Dr. Bibhuti Lahkar	Maharashtra	Deulgaon-Rehekuri WLS	2022-2023
277	Dr. Sutirtha Dutta	Maharashtra	Gautala-Autramghat WLS	2022-2023
278		Maharashtra	Jaikwadi Bird WLS	2022-2023
279		Maharashtra	KalsubaiHarishchandragad WLS	2022-2023
280		Maharashtra	Kanhargao WLS	2022-2023
281		Maharashtra	Karanja Sohal (Blackbuck) WLS	2022-2023
282		Maharashtra	Katepurna WLS	2022-2023
283		Maharashtra	Lonar WLS	2022-2023
284	<b>Dr. Alok Saxena</b>	Rajasthan	Band Barella WLS	2022-2023
285	Dr. Jayant Kulkarni	Rajasthan	Bassi WLS	2022-2023
286	Dr. Aishwarya Maheshwari	Rajasthan	Jaisamand WLS	2022-2023
287	Dr. Bitapi Sinha	Rajasthan	Jamwa Ramgarh WLS	2022-2023
288		Rajasthan	Kesarbagh WLS	2022-2023
289		Rajasthan	Phulwari Ki Nal WLS	2022-2023
290		Gujarat	Gaga (Great Indian Bustard) WLS	2022-2023
291		Gujarat	Girnar WLS	2022-2023
292		Gujarat	Hingolgadh WLS	2022-2023
293		Gujarat	Mitiyala WLS	2022-2023
294	<b>Shri V.K. Uniyal</b>	Arunachal Pradesh	D'Ering Memorial (Lali) WLS	2022-2023
295	Dr. Rahul Mungikar	Arunachal Pradesh	Dibang WLS	2022-2023
296	Dr. Gaurav Sharma	Arunachal Pradesh	Eagle Nest WLS	2022-2023
297	Dr. Nasim Ahmad	Arunachal Pradesh	Itanagar WLS	2022-2023
298		Arunachal Pradesh	Kamala WLS	2022-2023
299		Arunachal Pradesh	Kane WLS	2022-2023
300		Arunachal Pradesh	Mouling NP	2022-2023
301		Arunachal Pradesh	Ringba-Roba WLS	2022-2023
302	<b>Shri T.T.C. Marak</b>	Assam	Borail WLS	2022-2023
303	Dr. Justus Joshua	Assam	Bherjan-Borajan-Padumoni WLS	2022-2023
304	Dr. Yogesh Dubey	Assam	Dibrus-Saikhowa NP	2022-2023
305	Dr. Nehru Prabakaran	Assam	Dihing Patkai WLS	2022-2023

S. No.	MEE Team (Chairman & Members)	State	Name of PA	Year
306		Assam	Hollongapar Gibbon WLS	2022-2023
307		Nagaland	Singphan WLS	2022-2023
308		Meghalaya	Baghmara Pitcher Plant WLS	2022-2023
309	<b>Shri Anur P. Reddy</b>	Manipur	Bunning WLS	2022-2023
310	Dr. N. Odyou	Manipur	Jiri Makru WLS	2022-2023
311	Shri B.C. Choudhury	Manipur	Kailam WLS	2022-2023
312	Dr. Lallianpui Kawlni	Manipur	Khongjaingamba Ching WLS	2022-2023
313		Manipur	Shirui NP	2022-2023
314		Manipur	Zeiland WLS	2022-2023
315	<b>Shri Vinay Luthra</b>	Mizoram	Khawnglung WLS	2022-2023
316	Dr. Lalit Kumar Sharma	Mizoram	Lengteng WLS	2022-2023
317	Dr. Ritesh Kumar	Mizoram	Murlen NP	2022-2023
318	Dr. Lallianpui Kawlni	Mizoram	Ngengpui WLS	2022-2023
319		Mizoram	Phawngpui Blue Mountain NP	2022-2023
320		Mizoram	Tawi WLS	2022-2023
321		Mizoram	Tokalo WLS	2022-2023
322	<b>Shri Dipak Sarmah</b>	Sikkim	Kitam Bird WLS	2022-2023
323	Dr. Advait Edgoankar	Sikkim	Shingba Rhododendron WLS	2022-2023
324	Ms. Seema Bhatt	Tripura	Bison (Rajbari) NP	2022-2023
325	Dr. B.S. Adhikari	Tripura	Clouded Leopard NP	2022-2023
326		Tripura	Gumti WLS	2022-2023
327		Tripura	Rowa WLS	2022-2023
328		Tripura	Trishna WLS	2022-2023
<b>Phase III (2023-2025)</b>				
329	<b>Shri Ishwar Singh</b>	Punjab	Bir Motibagh	2023-2025
330	Dr. Anil Rathi	Punjab	Jhajjar Bacholi WLS	2023-2025
331	Dr. P.K. Mathur	Punjab	Kathlaur Kushlian WLS	2023-2025
332	Dr. Amit Kumar	Punjab	Nangal WLS	2023-2025
333		Punjab	Takhni-Rehampur WLS	2023-2025
334	<b>Shri Vidy Bhushan Kumar</b>	Himachal Pradesh	Sainj WLS	2023-2025
335	Dr. Vibhu Prakash	Himachal Pradesh	Tirthan WLS	2023-2025
336	Ms. Seema Bhatt	Himachal Pradesh	Shikari Devi WLS	2023-2025
337	Dr. Salvador Lyngdoh	Himachal Pradesh	Nargu WLS	2023-2025
338	<b>Shri R.K. Srivastava</b>	Himachal Pradesh	Lippa Asrang WLS	2023-2025
339	Dr. G.S. Rawat	Himachal Pradesh	Rakchham Chitkul (Sangla Valley) WLS	2023-2025
340	Dr. Gajendra Singh	Himachal Pradesh	Majathal WLS	2023-2025
341	Dr. Gautam Talukdar	Himachal Pradesh	Talra WLS	2023-2025
342		Himachal Pradesh	Renukaji WLS	2023-2025
343	<b>Shri Pawan Kumar</b>	Himachal Pradesh	Sech Tuan Nala WLS	2023-2025
344	Dr. Rajarshi Dasgupta	Himachal Pradesh	Tundah WLS	2023-2025
345	Dr. Nasim Ahmad	Himachal Pradesh	Kugti WLS	2023-2025

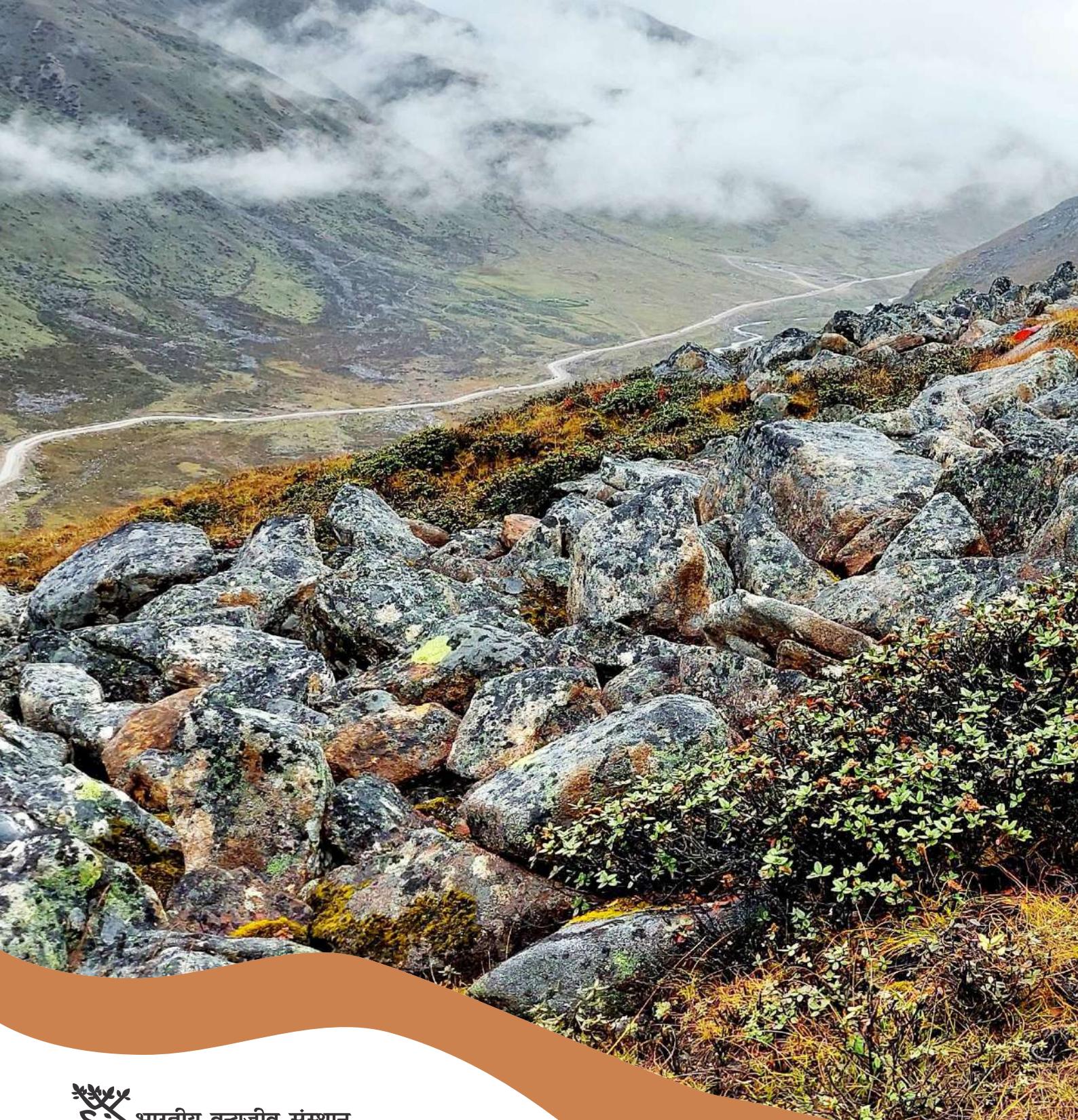
S. No.	MEE Team (Chairman & Members)	State	Name of PA	Year
346	Dr. Vishnupriya Kolipakam	Haryana	Bir Shikargah WLS	2023-2025
347		Haryana	Khaparwas WLS	2023-2025
348		Haryana	Nahar WLS	2023-2025
349	<b>Shri Ajay Shrivastav</b>	Uttar Pradesh	Jai Prakash Narayan (Surhatal) Bird WLS	2023-2025
350	Dr. Faiyyaz Khudsar	Uttar Pradesh	Saman Bird WLS	2023-2025
351	Dr. Sumit Dookia	Uttar Pradesh	Samaspur Bird WLS	2023-2025
352	Dr. Sandeep Gupta	Uttar Pradesh	Sandi Bird WLS	2023-2025
353		Uttar Pradesh	Turtle WLS	2023-2025
354		Uttar Pradesh	Vijai Sagar WLS	2023-2025
355	<b>Shri VK Uniyal</b>	Uttarakhand	Nandhaur WLS	2023-2025
356	Dr. Khurshid Ahmad	Jammu & Kashmir	Nandini WLS	2023-2025
357	Dr. Rahul Mungikar	Jammu & Kashmir	Overa-Aru WLS	2023-2025
358	Dr. K Ramesh	Jammu & Kashmir	Rajparian (Daksum) WLS	2023-2025
359		Jammu & Kashmir	Ramnagar Rakha WLS	2023-2025
360		Jammu & Kashmir	Surinsar Mansar WLS	2023-2025
361		Jammu & Kashmir	Tatakutti WLS	2023-2025
362	<b>Shri Shyamal Tikadar</b>	Andhra Pradesh	Nellapattu WLS	2023-2025
363	Dr. A.M. Dixit	Andhra Pradesh	Rollapadu WLS	2023-2025
364	Dr. Aishwarya Maheshwari	Andhra Pradesh	Sri Lankamalleswara WLS	2023-2025
365	Dr. J.A. Johnson	Telangana	Lanja Madugu Siwaram WLS	2023-2025
366		Telangana	Pocharam WLS	2023-2025
367		Telangana	Pranahita WLS	2023-2025
368	<b>Shri Swargam Srinivas</b>	Karnataka	Pushpagiri WLS	2023-2025
369	Dr. Afifullah Khan	Karnataka	Ranebennur (Blackbuck) WLS	2023-2025
370	Dr. Justus Joshua	Karnataka	Ranganathittu Bird WLS	2023-2025
371	Dr. Abhijit Das	Karnataka	Ramadevara Betta Vulture WLS	2023-2025
372		Karnataka	Talakaveri WLS	2023-2025
373	<b>Shri B.S. Bonal</b>	Karnataka	Sharavathi Valley LTM WLS	2023-2025
374	Dr Manish Kale	Karnataka	Shettihalli WLS	2023-2025
375	Dr Yogesh Dubey	Karnataka	Someshwara WLS	2023-2025
376	Dr Anukul Nath	Karnataka	Rangayyanadurga Four-horned Antelope WLS	2023-2025
377		Goa	Madei WLS	2023-2025
378	<b>Shri Nitin Kakodkar</b>	Kerala	Kottiyoor WLS	2023-2025
379	Dr. G. Areendran	Kerala	Kurinjimala WLS	2023-2025
380	Dr. P.S. Easa	Kerala	Mangalavanam Bird WLS	2023-2025
381	Dr. Navendu Page	Kerala	Neyyar WLS	2023-2025
382		Kerala	Peechi-Vazhani WLS	2023-2025
383		Kerala	Thattekad Bird WLS	2023-2025
384	<b>Shri Surendra Kumar</b>	Tamil Nadu	Nellai WLS	2023-2025

S. No.	MEE Team (Chairman & Members)	State	Name of PA	Year
385	Dr. Diwakar Sharma	Tamil Nadu	Vallanadu Blackbuck WLS	2023-2025
386	Dr. P.K. Mohan	Tamil Nadu	Sakkarakottai Bird WLS	2023-2025
387	Dr. C. Ramesh	Tamil Nadu	Therthangal Bird WLS	2023-2025
388		Tamil Nadu	Vettangudi Bird WLS	2023-2025
389	<b>Shri S.B. Limaye</b>	Tamil Nadu	Vaduvoor Bird WLS	2023-2025
390	Dr. Wesley Sunderraj	Tamil Nadu	Vedathangal Lake Bird	2023-2025
391	Dr. Parikshit Gautam	Tamil Nadu	Oussudu Lake Bird WLS	2023-2025
392	Dr. Nehru Prabakaran	Tamil Nadu	Vellode Birds WLS	2023-2025
393		Tamil Nadu	Udayamarthandapuram Bird WLS	2023-2025
394		West Bengal	Raiganj WLS	2023-2025
395	<b>Dr. Subrat Mukherjee</b>	Chhattisgarh	Sarangarh-Gomardha WLS	2023-2025
396	Dr. Bibhuti Lahkar	Odisha	Baisipalli WLS	2023-2025
397	Dr. Umesh Kumar	Odisha	Khalasuni WLS	2023-2025
398	Dr. Samrat Mondal	Odisha	Kuldiha WLS	2023-2025
399	<b>Shri V.K. Melkani</b>	Gujarat	Narayan Sarovar Chinkara WLS	2023-2025
400	Dr. Monalisa Sen	Gujarat	Paniya WLS	2023-2025
401	Dr. Jeet Ram	Gujarat	Porbandar Bird WLS	2023-2025
402	Dr. B. S. Adhikari	Gujarat	Rampara Vidi WLS	2023-2025
403		Gujarat	Ratanmahal Sloth Bear WLS	2023-2025
404		Gujarat	Thol Lake WLS	2023-2025
405	<b>Shri J. T. Mathew</b>	Madhya Pradesh	Phen WLS	2023-2025
406	Dr. Jayant Kulkarni	Madhya Pradesh	Ralamandal WLS	2023-2025
407	Dr. Advait Edgaonkar	Madhya Pradesh	Sailana WLS	2023-2025
408	Dr. R. Suresh Kumar	Madhya Pradesh	Sardarpur WLS	2023-2025
409		Madhya Pradesh	Singhori WLS	2023-2025
410		Madhya Pradesh	Son Gharial WLS	2023-2025
411		Madhya Pradesh	Veerangana Durgavati WLS	2023-2025
412	<b>Shri Shailendra Singh</b>	Maharashtra	Tungareshwar WLS	2023-2025
413	Dr. Dipankar Ghosh	Maharashtra	Mayureswar Supe WLS	2023-2025
414	Dr. Shalini Dhyani	Maharashtra	Naigaon Peacock	2023-2025
415	Dr. Bilal Habib	Maharashtra	Nandurmadhyameshwar WLS	2023-2025
416		Maharashtra	Yedshi Ramling Ghat WLS	2023-2025
417		Maharashtra	Radhanagari WLS	2023-2025
418	<b>Shri N.K. Vasu</b>	Maharashtra	Sagareswar WLS	2023-2025
419	Dr. Rathin Barman	Maharashtra	Tipeshwar WLS	2023-2025
420	Dr. Ritesh Kumar	Maharashtra	Umred- Karhandla WLS	2023-2025
421	Dr. Bivash Pandav	Maharashtra	Yawal WLS	2023-2025
422		Maharashtra	Painganga WLS	2023-2025
423	<b>Shri Sanjaya Singh</b>	Rajasthan	Ramsagar WLS	2023-2025
424	Dr. E.A. Jayson	Rajasthan	Sajjangarh WLS	2023-2025
425	Dr. Abhishek Bhatnagar	Rajasthan	Shergarh WLS	2023-2025

S. No.	MEE Team (Chairman & Members)	State	Name of PA	Year
426	Dr. Sutirtha Dutta	Rajasthan	Tal Chhapar WLS	2023-2025
427		Rajasthan	Todgarh Raoli WLS	2023-2025
428		Rajasthan	Van Vihar WLS	2023-2025
429	<b>Shri Aditya Joshi</b>	Arunachal Pradesh	Mehao WLS	2023-2025
430	Dr. B.C. Choudhary	Arunachal Pradesh	Tale WLS	2023-2025
431	Dr. N. Odyou	Arunachal Pradesh	Yordi Rabe Supse WLS	2023-2025
432	Dr. Gopi G.V.	Mizoram	Pualreng WLS	2023-2025
433		Mizoram	Thorangtlang WLS	2023-2025
434	<b>Shri Ravikant Sinha</b>	Assam	Raimona NP	2023-2025
435	Dr. Lalit Kumar	Assam	Marat Longri WLS	2023-2025
436	Dr. Devendra Kumar	Assam	Nambor WLS	2023-2025
437	Dr. Lallianpui Kawlni	Assam	Nambor-Doigrung WLS	2023-2025
438		Assam	Pani-Dihing Bird WLS	2023-2025







भारतीय वन्यजीव संस्थान  
Wildlife Institute of India

Chandrabani, Dehradun - 248001  
Uttarakhand

Tel.: 0135 - 2646340  
Fax: 0135 - 2640117

Website: [www.wii.gov.in](http://www.wii.gov.in)  
Email: [mee.support@wii.gov.in](mailto:mee.support@wii.gov.in)

---

**Citation:** Awasthi S.K., Tiwari V.R., & Talukdar G.H. (TR.No./2025/09) Management Effectiveness Evaluation (MEE) of 438 National Parks and Wildlife Sanctuaries in India 2020–2025. Wildlife Institute of India, Dehradun.

**Cover Photo:** Sikkim Rhubarb (*Rheum nobile*), Lahsar Valley, Sikkim © Dr. Vivek Sarkar