I/58804/2023

F. No. 1-49/2022WL
Government of India
Ministry of Environment, Forest and Climate Change
(Wildlife Division)

6th Floor, Vayu Wing,
Indira Paryavaran Bhawan,
Jorbagh Road, Aliganj,
New Delhi-110003

Dated: 30th November 2023

The Chief Wild Life Warden,
All States/Union Territories.

Sub: Guidelines for the process of management planning for Protected Areas (PAs) and other landscape elements in accordance with Section 33 of the Wild Life (Protection) Act, 1972.- Reg.

Madam/Sir,

The Section 33 of the Wild Life (Protection) Act, 1972, provides for the following "*The Chief Wild Life Warden shall be the authority who shall control, manage and protect all sanctuaries in accordance with such management plans for the sanctuary approved by him as per the guidelines issued by the Central Government and in case the sanctuary also falls under the Scheduled Areas or areas where the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 (2 of 2007) is applicable, in accordance with the management plan for such sanctuary prepared after due consultation with the Gram Sabha concerned and for that purpose, within the limits of any sanctuary, —.....*"

Accordingly, the Ministry of Environment, Forest and Climate Change had constituted a committee under the Chairmanship of ADGF (WL) and Director, Wild Life Preservation for drafting guidelines and the framework for management plan. Several meetings of the committee were conducted. The draft guidelines and the framework for the Management Plan for protected areas has been prepared after discussions and recommendations of the committee and other special invitees.

Subsequently, the Ministry of Environment, Forest and Climate Change finalized the Guidelines for the process of management planning for Protected Areas (PAs) and other landscape elements in accordance with Section 33 of the Wild Life (Protection) Act, 1972.

The undersigned is directed to enclose a copy of the '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 and request that the said Guidelines be used for the process of management planning for Protected Areas (PAs) and other landscape elements henceforth.

I/58804/2023

Further, the Chief Wild Life Wardens are requested to kindly share the details of such Protected Areas, wherein the Management Plans have either been expired or would be expired by 2024, for further consideration of this Ministry.

Yours faithfully,

Signed by
Rakesh Kumar Jagenia
Date: 30-11-2023 17:30:38

(Rakesh Kumar Jagenia)
Deputy Inspector General of Forests (WL)
E.mail: digwl-mefcc@gov.in

Encl: As above.

Copy to:

1. PPS to Addl. DGF(WL) & Director, Wild Life Preservation, MoEFCC
2. PPS to Addl. DGF(PT) &Member Secretary, NTCA, MoEFCC, New Delhi
3. PS to Inspector General of Forests (Project Elephant), MoEFCC, New Delhi
4. PPS to Inspector General of Forests (Wildlife), MoEFCC, New Delhi
5. PS to Joint Director (WL), MoEFCC, New Delhi.

Ministry of Environment, Forest and Climate Change
Government of India
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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

CONTENTS

PART A

1. INTRODUCTION

Protected Areas (PAs) are areas of adequate ecological, faunal, floral, geomorphological, natural or zoological significance notified for the purpose of protecting, propagating or developing wildlife or its environment, and for protecting landscapes, seascapes, flora and fauna and their habitat. The National Wildlife Action Plan (2017-2031) identifies PAs as well-defined geographical spaces which are recognized, dedicated and managed through legal and other effective means to achieve long term conservation of nature with associated ecosystem services and cultural values. As per section 2 (24A) of the Wild Life (Protection) Act, 1972 (hereinafter referred as the 'Act'), a PA means a National Park, Sanctuary, Conservation Reserve or Community Reserve notified under sections 18, 35, 36A and 36C of the Act.

The National Wildlife Database Cell of Wildlife Institute of India (WII) has been developing a National Wildlife Information System (NWIS) on the PAs of the country. As on 4th January, 2023, India has a network of 998 PAs including 106 National Parks, 567 Wildlife Sanctuaries, 105 Conservation Reserves and 220 Community Reserves covering a total of 1,73,629.52 km2 of geographical area of the country which is approximately 5.28%. The success of PAs as a tool for conservation is based around the assumption that they are managed to protect the values that they contain (Hockings et al. 2006).

The Ministry of Environment, Forest and Climate Change lays strong emphasis on the preparation of scientifically and ecologically sound management plans for the PAs. Many States have developed their own mechanisms to prepare and review the Management Plans. The Chief Wild Life Warden (CWLW) of the State/UT shall coordinate in the preparation of Management Plans. In context of the need of an ecosystem approach for management of natural resources and focus on sustainability, it is necessary that an integration of principles is approached with a basic framework on principles of a sound ecosystem centric management planning for PAs or other forest resources. The outlines of a standard management plan preparation for PAs have been published by the WII earlier in 2005. The document remains the basic reference material for management planning for wild life.

However, the scope of wild life management and biodiversity conservation has encompassed all the forests and other peripheral land uses – outside or within PAs.

Section 33 of the Wild Life (Protection) Act, 1972 provides that:
"33. Control of Sanctuaries.- The Chief Wild Life Warden shall be the authority who shall control, manage and protect all sanctuaries in accordance with such management plans for the sanctuary approved by him as per the guidelines issued by the Central Government, and in case the sanctuary

also falls under the Scheduled Areas or areas where the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 (2 of 2007) is applicable, in accordance with the management plan for such sanctuary prepared after due consultation with the Gram Sabha concerned and for that purpose, within the limits of any sanctuary..-

(a) may construct such roads, bridges, buildings, fences or barrier gates, and carry out such other works as he may consider necessary for the purposes of such sanctuary;

Provided that no construction of commercial tourist lodges, hotels, zoos and safari parks shall be undertaken inside a sanctuary except with the prior approval of the National Board;

(b) shall take such steps as will ensure the security of wild animals in the sanctuary and the preservation of the sanctuary and wild animals therein;

(c) may take such measures, in the interests of wildlife, as he may consider necessary for the improvement of any habitat;

(d) may regulate, control, or prohibit, in keeping with the interests of wildlife, the grazing or movement of livestock

[* *No grazing of any live-stock shall be permitted in a National Park and no live-stock shall be allowed to enter therein except where such live-stock is used as a vehicle by a person authorized to enter such National Park- Section 35(7).*]

These guidelines are, therefore, notified in accordance with the Act.

The guidelines provide a holistic approach to better scientific planning of PAs in accordance with the current management practices undertaken globally. As compared to the earlier publication of WII (2005) cited above, management of specific habitats like coastal and marine PAs, wetlands, estuaries, mangroves etc. which have been notified and deemed as PAs under the Act have also been dealt in these guidelines.

2. DEFINITIONS AND APPLICABILITY OF SECTION 33 OF THE ACT

i. **National Park:** As per section 2 (21) of the Act, a National Park means an area declared, whether under section 35 or section 38, or deemed, under sub- section (3) of section 66, to be declared, as a National Park;
ii. **"sanctuary"** means an area declared as a sanctuary by notification under the provisions of Chapter IV of the Act and shall also include a deemed sanctuary under sub-section (*4*) of section 66;
iii. As per section 66 (3) of the Act, any sanctuary or National Park declared by a State Government under any Act repealed under sub-section (*1*) shall be deemed to be a sanctuary or National Park, as, the case may be, declared by the State Government

under this Act and where any right in or over any land in any such National Park which had not been extinguished under the said Act, at or before the commencement of the Act, the extinguishment of such rights shall be made in accordance with the provisions of the Act.

iv. Further, in accordance with section 66 (4) of the Wild Life (Protection) Act, 1972, where any proceeding under any provision of section 19 to 25 (both inclusive) is pending on the date of commencement of the Wild Life (Protection) Amendment Act, 1991 (44 of 1991), any reserve forest or a part of territorial waters comprised within a sanctuary declared under section 18 to be a sanctuary before the date of such commencement shall be deemed to be a sanctuary declared under section 26A of the Act.

v. In accordance with section 18A and section 35 (3A) of the Act, section 33 is applicable to the areas for which the State Government or Central Government has declared intention to notify such areas as sanctuaries and National Parks respectively.

vi. Section 33 of the Act is also applicable (except for clauses 'a' and 'd') in case of tiger reserves, conservation reserves and community reserves in accordance with sections 38V (2), 36A (2) and 36C (2) respectively of the Act.

These guidelines shall, therefore, be applicable to all the areas as mentioned herein in accordance with section 33 of the Act. However, so far as management planning of tiger reserves is concerned, the tiger conservation plan shall be prepared in accordance with the guidelines issued by the National Tiger Conservation Authority except that the wherever required, consultations with Gram Sabha shall be done in accordance with section 33 and section 38XA of the Act.

3. INSTITUTIONAL ESSENTIALS FOR MANAGEMENT PLANNING

These guidelines provide a basic framework which is implementable within the plan period must be scientifically prepared through a consultative process as per the Act. The progress of implementation of management plans shall be monitored to ensure that the prescriptions are implemented. No management plan should be extended beyond its specified period. The CWLW shall ensure that the subsequent management plan is in place for operation from the date the previous one completes its term.

The guideline lay out a substantial canvas of tasks for the CWLW and the officers subordinate to him involved in the process of preparation, approval and implementation of the Management Plan of the area as follows:

i. For planning and implementation of such plans, field officials shall be supported by the CWLW and his/her team to accomplish aspects of their mandate of the Management Plan including securing the budgetary support within the plan period.

ii. For the purpose of evaluation formulation of the management plan of a PA, the State Government may constitute a committee comprising of an officer working in the Wildlife Wing in the State as the Member-Convener, PA manager, relevant State/UT forest

department officials, officials from the Regional offices of the Ministry of Environment, Forest and Climate Change, line department officials, experts in the field of wildlife conservation, one or two members of the State Board for Wild Life, and local community representatives. The Committee shall meet at such place and time as intimated by the Member-Convener. Wherever, the management plan under consideration is for conservation reserve or committee reserve, the chairperson of the conservation reserve management committee or the community reserve management committee shall be the special invitee during the meetings.

iii. The Act provides for an Advisory Committee for sanctuaries under section 33B for rendering advice on measures for better conservation and management of PAs including participation of the people living within and around. It needs to be ensured that for every PA such committee is established. The advice of rendered by these committees may also be considered for incorporation in the management plan of the PA.

iv. The CWLW's team should include a small group of officers—managers, scientists, technicians --as part of the office of the CWLW for managing a range of statewide tasks relating to planning and management of PAs, corridors, landscapes and seascapes. This will help maintain a state level snapshot of the status of forest and wild life management.

v. Apart from the above mentioned arrangements, the Field management team of the units (PA or non-PA) must be supported by the Chief Wild Life Warden and the State Forest Department by organizing appropriate provision of financial, human and technical resources for implementation of the management plans. For general governance effectiveness, various orders, circulars, guidelines, action plans etc. relevant to PA planning and management, new laws and rules of interest—in country and international should be accessed, interpreted and effectively communicated to facilitate implementation in letter and spirit.

vi. At functional level in the department, settlement and documentation of rights under the relevant provisions of the Wild Life (Protection) Act 1972 and the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 (FRA), the processes of relocation of villages and ensuring the wellbeing of villagers on the sites where the villages have been rehabilitated needs a close oversight of the state level administration.

vii. At state policy level, PA Conservation Foundations for PAs, resource mobilization through support under CSR and integration of ecotourism/ wildlife tourism needs to be facilitated by pursuing at the state government level.

viii. Networking with CWLWs of other states in the region for the purpose of mutual sharing of significant intelligence for protection and follow up actions; mutual sharing of good practices, experiments, intervention strategies and testing experiences can be very helpful in bringing efficiency in the management.

ix. Convergence of multi-agency resources by undertaking institutional mapping for the purpose of enlisting planning and management support for terrestrial, inland wetland and coastal and marine PAs must be ensured. Taking such issues at the meetings of the State Board of Wild Life for appropriate decisions should be resorted to.

x. Among the other most important tasks of the CWLW shall include organizing desk research to extract and paraphrase as necessary the emerging scientific concepts, revelations and practices from peer reviewed journals, reports, books and other literature being published to strengthen the scientific understanding of field managers, for encouraging experimentation and for exploring application of good practices. The

documented outcomes of various studies and projects relevant to PA planning and management must be procured and provided to planners and managers. Observations and data collection related to the preservation plots for monitoring change in vegetation need to be organized by setting up network and documentation of such plots. Habitats of inland wetlands and those of coastal and marine ecosystems need to be monitored by suitable robust systems.

xi. The outcomes of insights need to be interpreted and used to improve habitat management planning and should be passed on to field managers to improve the understanding of the impacts of these influences for the purpose of responding appropriately with conservation strategies.

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4. CONSERVATION VALUES AND THE ROLE OF PROTECTED AREAS (PAs)

The PAs on virtue of the stronger protection are expected to serve as source areas with higher rates of recruitment into the populations of species of wild animals and plants. These fragmented sources need connectivity with other source areas to balance the decline and supporting the cause of meta-populations. To enable such role of PAs, the following shall be considered:

i. The management planning of the linked areas like corridors and other habitats requires syncing with zonal master plan preparation for the Eco-sensitive Zones around the National Parks and sanctuaries within the landscapes.
ii. PAs might be small in extent and dwarfed by the extensive landscapes in which they are located but PAs are the drivers of the evolutionary and ecological processes and therefore, are indispensable for sustenance of the habitats and flow of material and ecosystem services from the landscape. PAs are to be managed for nurturing the conservation values in their prime state, and the conservation values are to be monitored and managed on sustainable basis in other components of the landscapes, particularly other forests.
iii. The State Governments should endeavor to get the Eco-sensitive Zones notified at the earliest. Due care shall be taken so that the Zonal Master Plan of the notified ESZ is in consonance with the Management Plan of the PA. Ecosystem evaluation services of the PA should be given thrust and these should be broadly spelt out in the management plan. The species richness and uniqueness should be highlighted to bring forth the conservation value of the PA.

5. THE PLANNING PROCESS AND THE TERM OF PLAN

Every PA is unique in terms of its geographical location, species presence, and impact of activities outside the PA, natural and cultural characteristics of the area. Therefore, the management prescriptions for the PAs must be site specific. Some of the unique habitats are mentioned below:

i. ***Corridors & Landscapes***

As far as possible, connectivity between natural habitats should be maintained and areas surrounding the PAs need to be zoned and managed in as compatible as possible. This approach ensure that habitat do not suffer from fragmentation due to the resultant "island effect". While many of these areas may be outside management unit, the management plan should consider the broader land use and connectivity aspects. This landscape approach will ensure that there is no abrupt or sharp discontinuity between PAs and other land use zones. The management plan should clearly identify and map corridors and connectivity along with the land use and land tenure of these corridors. Management prescriptions for both, species specific niche requirements in the identified corridors, as well as habitat connectivity for activities, *inter-alia*, including land use, land use change, infrastructure development activities, within any identified/specific corridors, should be distinctly brought out in the Plan and to the extent possible, management recommendations should be included so that their

functionality is maintained over time. This can be done in the production forestry area by prescription in the respective working/management plans, and in non-forest areas by close collaboration with community institutions (e.g., *Panchayat*) and local people.

ii. ***Planning management for conservation of biological diversity.***

As stated at the outset, the stewardship of 21% of the country's geographical area (Recorded Forest Area or RFA) is vested in the forest department. Those areas excluding the PAs and forest patches under restoration and catchment protection are under various traditional forestry management systems. From the perspective of conservation of biological diversity these lands, whether covered or not by vegetation account for a series of different habitats and species constituting a variety of ecosystems. The role of forests in conservation of biological diversity as the ecological continuum of landscapes, seascapes and the import of ecosystem services with the PAs has to be *a priory* objective of management.

The National Forest Policy, 1988 (NFP) lays down the mandate for managing forests in India. Conservation of biological diversity is central to the forester's mandate and all other actions to be taken under the NFP become subordinate to this requirement. It is known that animals and plants are inseparably dependent on each other. Pollination and seed dispersal served by the agencies of insects, reptiles, birds and mammals (herbivores and carnivores) are linked to forest productivity. The definition of 'productivity' therefore has to be understood as *'the capability of the soil for producing the series of native plants and animals at a given geographic location'*. Thus, productivity is sustained by complex biotic and abiotic relationships recognized as ecological processes and functions. *It will thus be seen that the term 'productivity' becomes synonymous with 'biological diversity' and 'wildlife'.*

iii. ***Ecosystem based management (EBM)***

Within the landscapes, PAs act as the *source areas* to counter balance the negative role of *sink areas* constituted by habitats outside the PAs and corridors perform the vital function of supporting dispersal of source populations for this purpose and help in creating *metapopulations* in support of managing biological diversity at large spatial scales as has been stated before.

The principles of EBM would thus be to sustainably manage both target and non-target species involving a three-pronged approach of protection, conservation and restoration of habitat quality to maintain ecosystem functions and services. The features of EBM

goals, therefore, while ensuring sustainable harvesting of products from such forests, shall be:

a. Ensuring connectivity within and between systems i.e. attempting connectivity between habitat patches through a network of corridors aiming at large landscapes.
b. Emphasizing protection and restoration of ecosystem structure, functions, and processes.
c. Focusing for the purpose on the consequences of human actions within a specific ecosystem/management area.
d. Incorporating social dimensions of resource use and ecosystem values into management.
e. Integrating biological, socioeconomic and governance perspectives.
f. The forest working plan thus, should integrate active management for conservation of biological diversity. The silvicultural treatments and other forestry operations are powerful tools for maintaining, restoring and enhancing habitat extent and quality. To that end after having ascertained the wild animal species composition (vertebrates) of the area the system based on management indicator species can be adopted to maintain, create and restore habitats.

iv. ***Inland fresh/brackish water wetlands***

The wetlands

Management planning for PAs representing wetlands has not received the kind of attention the terrestrial PA systems have received. Ecological/ biological/socio-economic scientific treaties on wetlands, for that matter also concerning the coastal and marine ecosystems (wetlands with or without terrestrial components) are equally rich and important. Five major wetland types are generally recognized:

a. Marine (coastal wetlands including coastal lagoons, rocky shores, and coral reefs);
b. Estuarine (including deltas, tidal marshes, and mangrove swamps);
c. Lacustrine (wetlands associated with lakes);
d. Riverine (wetlands along rivers and streams); and
e. Palustrine (meaning “marshy” - marshes, swamps and bogs).

Wetland structure and functions are dependent on hydrological regime of a wetland. Successful management of wetland sites requires adequate protection to the source of water. Insufficient water influx, outflux and shrinkage of zone of influence of wetlands is often a major cause of wetland loss and degradation.

Wetlands are liable to degrade due to enhanced eutrophication or blockage of riparian system or change in water quality leading to decreased species diversity, enhanced biomass production, increased turbidity, sedimentation and loss of recreational and aesthetic values. Therefore, maintenance of water quality and quantity should be one

of the important objectives of the management planning of wetlands and wetland PAs. Fishing is a major economic and livelihood related activity and can be a driver of the interface between management and communities.

v. ***The coastal and marine PAs***

Features of important habitat constituents and their values include *Mangroves, Coral Reefs, Sea Grass Meadows, Sand Dunes, Salt Marshes, Mudflats and Coastal Wetlands.* These habitats are affected by the flow of inland pollutants, toxic chemicals such as lead, mercury and aluminum from industrial effluents. These pose a grave risk to flora, fauna and human health. Excess nutrients from the agriculture areas lead to eutrophication. Accumulation of dredged material alters flooding regime, soil type, elevation, and alters plant and animal communities. The habitat is threatened by invasive species from land and sea.

5.1 The Planning Process

There shall be an exclusive wildlife management planning wing/cell in the office of the CWLW with officers/staff experienced in wildlife management headed by an officer not below the rank of Deputy Conservator of Forests assisted by a team of technical and field personnel for monitoring the process of timely initiation and completion of the planning process, its implementation monitoring and mid-term review. **The process is cited under Box-1.** The duration of each plan shall be for a period of 10 years. A mid-term appraisal can be arranged after a period of 5 years of plan application. The mid-term appraisal can provide basis for course corrections based on analysis of impacts and circumstances as an adaptive management practice.

The Wild Life (Protection) Amendment Act, 2022 has entered into force from 1st of April, 2023 vide S.O. 1394(E) dated 22nd March, 2023 of the Ministry of Environment, Forest and Climate Change. For the initial two years from the date of coming into force of the Wild Life (Protection) Amendment Act, 2022, the areas wherever section 33 is applicable shall be managed with the approved management plans already in existence. Wherever such approved management plans are not in existence or the existing approved management plan have their validity expiring within the two years of coming into force of the Wild Life (Protection) Amendment Act, 2022 shall be managed in accordance with short term management plans of one year each approved by the Chief Wild Life Warden of the State for the two from the date of coming into force of the Wild Life (Protection) Amendment Act, 2022.

The process for revision of the plan needs to be initiated on year prior to the completion of the management plan period so that the succeeding plan is ready at the end of the term of the preceding plan. The management planning process should be accomplished in two stages with the process extending not more than one year in total as follows:

5.1.1 Stage I

This stage mainly involves survey and preliminary consultations and preparation of a draft Plan. Among the most important roles of a PA is about maintaining 'naturalness'—of being planned and managed for the cause of native wild plants, animals and their habitats. Following are the cardinal principles of defining 'naturalness' and should be adopted in the course of process.

a. Historic environmental factors and ecological pattern—vegetation and animal communities, their distribution, habitats of biological and geomorphic origin. Distribution of the sources of water, their seasonality and regime. This survey of current status of the sources of water should include the existing, those that have declined and/or disappeared.
b. Identify and describe the degraded patches of vegetation/ habitats, their location and extent.
c. Evaluate the impacts of natural disasters in the immediate past—on the habitats for planning recovery of habitats.
d. Critically endangered/endangered species which need special attention (Featured Species) through a combination of protection and habitat restoration.
e. Identify and inventory the habitats/ ecological entities of special importance and their status – swamps, wetlands, grasslands, alpines, rocky outcrops (nesting sites of raptors) etc.

5.1.1.1 Data collection, background research and fieldwork:

Conservation values associated with the PA provide the objective of management:

a. The data should relate to both the physical aspects of the area, and to its ecological, biological, social/cultural and economic significance. It is best to create a field inventory of data already available and what might additionally be needed.
b. Review of all the general and specific research/ monitoring work relevant to the area of the PA should be specifically undertaken for use and for avoiding repetition.
c. The PA manager shall also take into account various court orders, government orders, policy directions issued by the Central and the State Government.

5.1.1.2 Evaluating the data and information

a. An essential part of carrying out an evaluation of information generated for any PA is to define the criteria by which to identify and measure its natural, cultural and socio-economic values, faunal, floral, geomorphological now and in the future. The analysis should include economic values involved for the communities, individual and community rights, need or feasibility of voluntary relocation of villages apart from biological, ecological, recreational, educational, cultural, religious, spiritual, and historic and other categories. The management planning process needs to be oriented to nurture the values identified by stakeholders.

b. The evaluation of values must include the human and ecological context at landscape, local, state and national levels. Along with the PA's broad purposes, this statement provides an important framework upon which the management plan should be based.
c. The objectives set to maintain and nourish the values need to be examined for constraints and threats. Threats may include human-induced or natural, and may originate from within the PA or from beyond its boundaries in the form of social or economic demands upon the PA. Prediction of future trends in visitor use, economic and related pressures, socioeconomic environment and ecological change should be analyzed. The district master plan should be analyzed to assess the impacts of future development on the PA.
d. The PA manager (and in case of conservation reserves and community reserves, an officer not below the rank of Assistant Conservator of Forests having jurisdiction over the area) familiarizing himself/herself with the management, its ecological profile, the local people, their traditions and customs and the use of the forest/ecosystems based resources, trends and practices. The conservation values, the objectives of management, problems and issues should be broadly identified to set out tentative strategies to generate a preliminary plan (PP).
e. The pre-planning phase starts with verification of the boundaries of the PA and its elements with respect to notification and existing GIS records, Spatial analysis being the most important part of the habitat based planning, a sound GIS supported by satellite imageries with linked databases form a very important infrastructure. If such GIS based spatial database is not available, it must be organised on priority.
f. The PP shall then be discussed with the identified stakeholders to finalise a plan outline.

5.1.2 Stage II

This sets the stage for analysis of information and systematic prescriptions, representing the second stage of detailed drafting. Management Plans are prepared mainly for regular use by PA managers, but the Panchayat Raj Institutions (PRI), local communities, members of the public, the bureaucracy, civil societies, scientists and academicians, those with commercial interests and neighbours are to be accounted as stakeholders wherever applicable for analysis of influences on the habitats and their role in conservation:

a. Before developing a detailed management plan, it is important to clarify theprimary objectives for which each PA has been set up as the management actions will be influenced by these objectives. For example, if the primarypurpose of a PA is to protect an endangered grassland bird species, thenmanagement practices will need to include maintenance of grasslands andpossibly suppressing growth of pioneer tree species. In other cases, a PA may havebeen set up primarily to conserve a representative ecosystem rather than aspecific species and in this case, management practices would be different. Insome cases, PAs can also have multiple management objectives, i.e. protectionof specific endangered species as well as a representative ecosystem

Management Plan objectives should be:

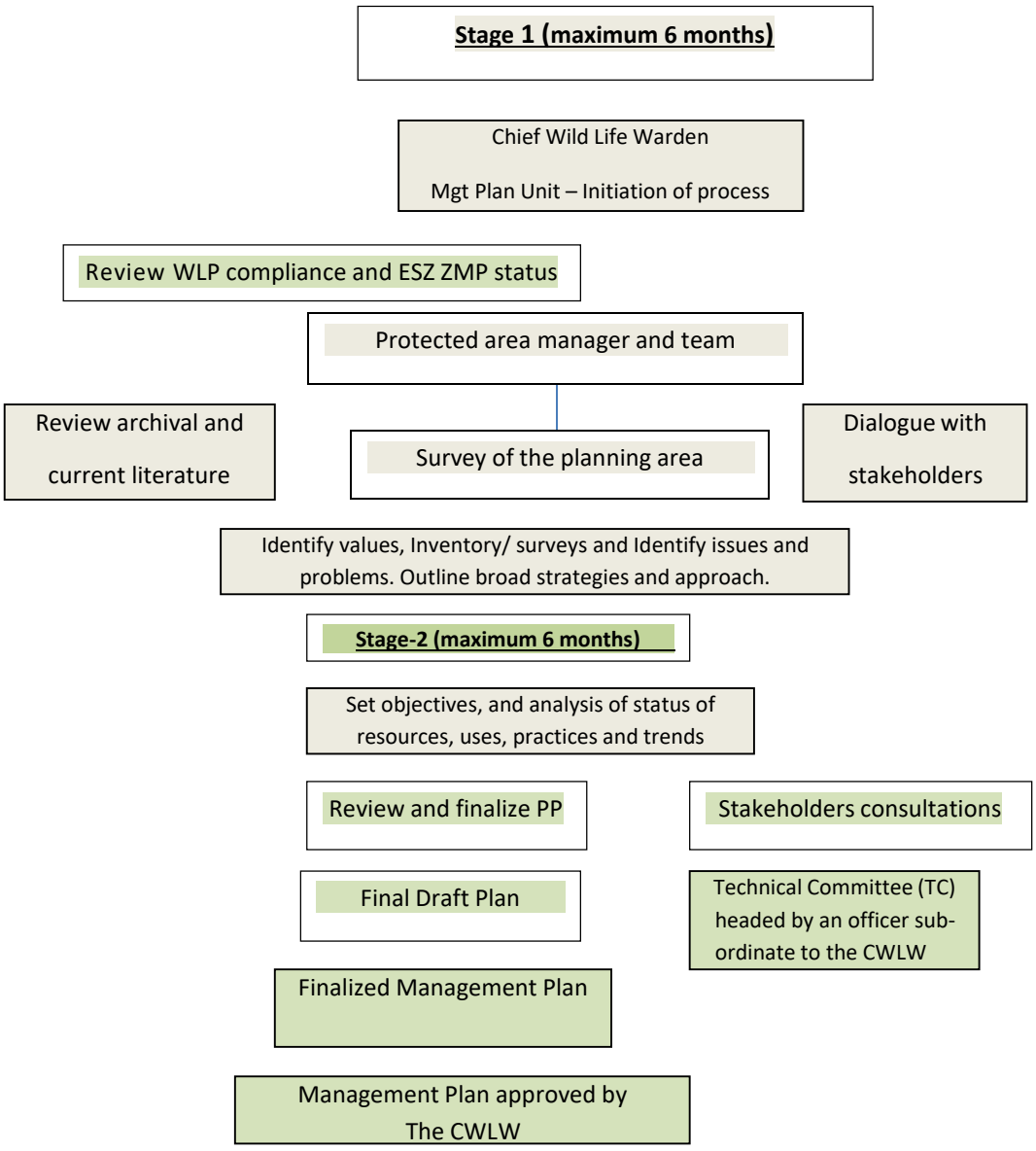
- Precise/specific

- Measurable
- Achievable
- Realistic
- Time-related
- Reflect reserve's purpose, significance and exceptional values
- Spell out the ends desired, but not the means to those ends
- Adequately address the issues

b. Further discussion and consultations with the stakeholders as mandated under section 33 of the Act and/or with advisory committee under section 33B of the Act or others as may be considered necessary to finalize the draft plan. The consultative process for the plan preparation needs to be notified sufficiently early to elicit good response of stakeholders on the appointed date and at the decided place.
c. The PA Manager needs to prepare and follow a well-laid out work schedule for the management planning process. The proceedings at various stages of the planning process including the consultation with various stakeholders need to be chronicled and summary record of discussions during such consultations should be drawn and maintained as a permanent record referred to as the PA Manager's Planning Book.
d. It would be necessary to identify corridors outside the PA boundaries that connect with important patches/areas of habitats in the surrounding landscape of which the PA is a part. If the PA boundaries abut territorial forests, then their management plans should be taken into account while preparation of working plans of the territorial forests and wildlife officials should be made part of the consultation.
e. Thereafter, the finalized draft plan shall be placed before the committee as envisaged under para 3 and seeking approval of the final plan from the CWLW.
f. Prior to the approval by the CWLW, the final draft management plan shall be sent to the Regional Office of the Ministry having jurisdiction over the concerned state/Union Territory for their vetting. The Regional Office shall examine and send comments if any to the CWLW within a period of thirty days from the receipt of the final draft management plan. The comments shall broadly be limited to the legal points and policy and guidelines aspects of the Ministry. The CWLW shall after incorporating the comments of the Regional Office, if found appropriate, approve the final draft management plan with such modifications. If the final draft Management Plan is not vetted within 30 days by concerned Regional Office, the same shall be treated as deemed to be vetted after the expiry of thirty days and the CWLW shall proceed with approval of the Final Management Plan.

It shall be the responsibility of the CWLW and the PA manager, and his team to initiate and complete the process timely.

Box 1-The PA management planning process



6. FRAMEWORK OF THE MANAGEMENT PLAN

A guidance framework for the Management Plan is placed as **Appendix I. Part C of this document.**

The management prescriptions for the PA shall be on the basis of specific zones and/or overlapping themes. There are some management operations that are common to entire PA or several specific areas within the PA such as protection, management of waterholes and grassland patches, control of weeds, maintenance of roads, strategies for climate change adaptations (CCA) and disaster risk reduction (DRR) etc. Further, certain areas within the PA may have specific themes such as protection to fragile and critical habitats; wilderness experience for visitors. Based on analysis and perceived needs, zone and theme plans will form a self-contained sub- plan with its specific objectives, issues, problems and strategies. The locations within the PA for which these interventions would be prescribed shall be clearly mentioned in the Management Plan either compartment wise or demarcating zones within clear boundaries. The following shall be incorporated in the management plan.

6.1. Protection

Protection is central to wildlife management. It is essential to have complete record of values of the area (PA) because many threats emanate from these. While some threats are general and universal in nature such as fires, encroachments, livestock grazing, firewood and NTFP collection, subsistence and non-subsistence hunting (poaching), opportunistic illegal cutting of trees etc. some might be different and specific to a PA.

6.1.1 The terrestrial ecosystems

The external and internal boundaries need to be maintained as unambiguously defined and demarcated on the ground. The important protection issues related to these ecosystems are as follows:

- Boundary demarcation on the ground as per the notification is a major challenge and thereby leading to encroachments,
- Seasonal forest fire
- Hunting of wild animals and tree felling,
- Trespassing
- Wildlife diseases
- Sand mining, collection of river bed materials
- Human wildlife conflicts

6.1.2 Inland wetland ecosystems

The issues relating to protection the protection of these ecosystems are as follows:

- Potential areas for illegal sand mining and removal of mud from lake/reservoir shores and river banks, marshes; removal/collection of boulders
- Disturbance to tree groves along lake/reservoir shores, river banks, marshes and swamps; disturbance to heronries; removal and destruction of snags, den trees and down trees; disturbance to microhabitats of geomorphic origins and islands (from boats and visitors)
- Illegal fishing. If fishing has been legally permitted in sections then guarding against use of gill nets, inappropriate mesh size, use of pesticides, poisons, explosives, location of landing sites at inappropriate places
- Sewage and solid waste disposal; industrial effluents; fertilizer and insecticides loaded effluents from farms; eutrophication
- Unsustainable able visitor activities like water sports, boating, wind sailing, anchoring boats in ecologically important stretches.

6.1.3 Coastal and marine ecosystems

Coastal and Marine ecosystems are unique in the sense that they have a complex human-biodiversity interface. Several fishing communities solely depend on these ecosystems for their livelihood. This dependence on the limited resources often leads to conflict situations amongst the conservation sector and the people. This calls for concerted efforts on the part of Marine Protected Area (MPA) Managers for managing the marine resources more sustainably. Therefore, MPA management plans need to be oriented on a multi-sectoral coordinated approach. As fisheries are dynamic and fishing will take place within an MPA, sustainable fisheries and zoning plans (which also addresses bycatch) need to be part of a management plan for an MPA.

In view of the above, the protection related issues are as under:

- Open Sea: overfishing, oil drilling, shipping/freight movement, non-conventional energy withdrawal, high intensity tourism.
- *Mangroves:* destructive fishing practices, cutting and removal; aquaculture; obstruction to fresh water flows.
- Creeks and Estuaries: overfishing, industrial pollution, mining, solid waste disposal.
- *Coral reefs*: reef mining, overfishing with small boats; illegal collection of fishes and other marine life for aquarium purposes; cyanide and blast fishing, fine net fishing, bioprospecting, irresponsible diving, snorkeling, sea walking, reef walking, boating and boat anchoring, disposal of untreated sewage and solid waste disposal; trawling especially during the nesting seasons of sea turtles
- *Seagrass meadows*: toxic, thermal and silt laden effluents, solid waste dumping, artificial stabilization of beaches; mooring of sea crafts; fishing by dragnets

- *Sand dunes and beaches*: sand mining, irresponsible tourism activities and tree planting, other means of artificial stabilization—sea walls, placements of concrete blocks and tetrapods, groynes
- *Caves*: entry and exploration, disturbance to cave dwelling species, illegal collection of nests of edible nest swiftlets
- Oil spills and discharge of ballast water.
- *Mudflats:* disturbance from visitors, obstruction to ingress of sediments

6.1.4 Indicative list of strategies for addressing protection issues

Following indicative list of prescriptions may be considered for addressing the protection issues in the management of the PA depending upon requirements:

- Besides markers like cairns their locations and perimeter need to be recorded by geographic coordinates using GPS.
- Identification of movement and genetic corridors including scope beyond the PA in the landscape.
- Documentation of forest rights under FRA – community rights and individual rights.
- Plan for an effective intelligence gathering system to include both the staff and members of local communities (informers and protectors of stakes).
- Important locations to watch for --weekly bazars, bus stands, eateries, places where trucks make their halts, butcher shops, and fish vending shops, places where livestock is sold, hair cutting saloons, shops where country liquor is sold (legally or illegally). Routine market surveillance is important to keep track of illegal forest produce. Native breeds of dogs are often used for hunting deer.
- Knowledge of vulnerable stretches: these are intrinsically attractive to criminals for their activities.
- Network of strategically located permanent anti-poaching/ patrolling camps in realistic numbers, wireless connectivity with solar panels to charge the batteries on regular basis. mobile facility has to be provided.
- If there are large water bodies like lakes and reservoirs, then sections of such waters need to be established as water beats with water craft/s for patrolling.
- Check posts with barriers to be planned and located along routes that pass through sensitive areas (wildlife standpoint) and at all entry points of the PA .
- Disease surveillance must be an integral part of not only the management plan, but also of the capacity building plan of personnel and communities.
- A central database for the PA needs to be established which has separate fields for protection related data and other wildlife related observations, for planning and strategy implementation for various aspects of PA management etc. Patrolling parties and supervising staff must be mandated to upload their recorded observations to the database at the end of the day (time spans can be assigned).

6.2. Research and monitoring

Research and monitoring have been recognised as two indispensable arms, which support and strengthen PA management. They improve understanding of issues and help in evolving strategies. Monitoring of measurable criteria for temporal dynamics the PA essentially requires regular data

collection and analysis. Therefore, a precise monitoring protocol with clear definition and schedule must be prescribed for the plan period. The ongoing protocols must be retained with further expansion wherever required for value addition of future analysis. Facets of the PA/forests needing further studies on spatial or species specific should be defined and researches on specific values and trends must be prescribed for adding values to the various attributes of the PA.

The Chief Wild Life Warden grants several permits under section 12 of the Act for carrying out research/study in the PA. The details of the permissions given during the previous plan period and reports received on account of these permissions should be invariably mentioned in the Management Plan. Further, the research gaps and requirements for the PA shall find place under this theme.

There must be mention of Management Effective Evaluation (MEE) reports received during the previous plan period. Long term recommendation of MEE should be taken into account during the mid-term appraisal of the Management Plan.

6.3. Wildlife Monitoring

Wildlife monitoring is an important tool for keeping surveillance of the natural environment which includes population estimation of key species, mapping of habitat mapping or of its components. It requires regular and periodic observation and recording of parameters on a long-term scale to show trends over time. There may be focus on a certain species, its population, an ecosystem, impacts of human activities and the relationship among various species and human activities. To expect desirable results, all monitoring exercise must guarantee a correct design and subsequent data analysis in order to provide information to involved stakeholders which is one of the key factors for wildlife management. A well-defined monitoring exercise shall help management resources and plan restoration efforts. These efforts shall assure better understanding of the occurrence, distribution and status of wildlife in the PAs and form the basis of better protection and seeking financial and technical assistance for conservation of rare, threatened, and endangered species in the PA.

Ministry of Environment, Forest and Climate Change anchors population estimation of tigers and elephants on periodic basis. These should appropriately figure in the management theme.

6.4. Mobility/Infrastructure management (road/rail/waterways network inside PA boundaries)

As per section 33 (a) of the Act, the CWLW in case of sanctuary and National Park may construct such roads, bridges, buildings, fences or barrier gates, and carry out such other works as he may consider necessary for the purposes of such sanctuary. Provided that no construction of tourist lodges, including Government lodges, for commercial purposes, hotels, zoos and safari parks shall be undertaken inside a sanctuary except with the prior approval of the National Board. The

requirement of these infrastructures shall be assessed objectively in relation to various themes and shall be prescribed under this theme. The prescriptions shall be made and implemented in accordance with the provisions available in the Act about the area as mentioned under the broad heading '**2 Definitions and applicability of section 33 of the Act'** in these guidelines. There should be emphasis on building only green infrastructures required for wildlife management with promotion of solar power within PA.

6.5. Protected Area Technology Infrastructure development

Efforts should be made to amalgamate modern technologies with the traditional methods of PA management and promote usage of modern technologies and such as:

i. The Geographic Information System (GIS) mapping has emerged as an important tool in the modern management practices of the PAs and their surroundings. The usage of this technology shall be emphasized for preparation and implementation of Management Plan for a PA. GIS technology shall be used for creating layers of management such as corridors mapping, human wildlife conflict hotspots, ecotourism zones, encroachments, settlements, rights allowed under the Scheduled Tribes and Other Traditional Forest Dwellers Act, 2005.
ii. Usage of technologies such as drone, GPS, mobile apps such as **Monitoring System for Tigers: Intensive Protection and Ecological Status** (MSTrIPES) for monitoring and surveillance should be encouraged.
iii. Boundary demarcation of the PAs using **Differential Global Positioning System (**DGPS) surveys should be given priority.

6.6. Staff Training and Capacity Building

Human resource of the managing units of PA are the back bone of the protection and management effectiveness. A careful and professional Human Resource Management policy, primarily aiming at winning their dedication for the field level work will be essential and management plan will need to take into consideration the following aspects for ensuring a dedicated work for the PA.

- Incentives and Rewards
- Family hostels and staff welfare society for providing soft loans.
- Health support and relief from accidents insurances against accidents, injuries and such health care

Frontline staff should be adequately trained in adoption of such modern tools and technology with periodic updation of their knowledge and skill through in-service short training courses.

6.7. People-Wildlife Interface issues

Incidences of negative interaction have been reported from time to time where wild animals including large mammals such as Nilgai (blue–bull), wild pig, elephant, tiger, leopard, bear etc. that are protected under the schedules of Wild Life (Protection) Act 1972, are involved. Human

wildlife negative interaction many a times results in to death/injury/permanent incapacitation of human beings/domestic animals/livestock due to attack by wild animals or loss of crops and property. Ministry of Environment, Forest and Climate Change has issued advisory/guidelines to deal with situations arising due to Human Wildlife Conflicts. The management prescriptions under this theme shall prescribe: identification of hotspots and mechanism for joint patrolling of these hotspots, establishment of rapid response teams, 24 X 7 control rooms, adoption of early warning systems, developing ecologically sustainable linear infrastructure, adoption of traditional/common management practices, projections for *ex-gratia* relief etc.

6.8. Eco-development

The process of eco-development is 'site specific' and is driven with genuine participation of people both at planning and later in implementation of mutually agreed activities in the field. The inputs of eco-development aim to increase resource productivity in the areas used by the people (who reside beyond the peripheries of the PA) and also to bring about reduction of their dependence levels on PA resources through interventions directed at creating alternative and additional livelihoods that have least such dependence including those for other basic needs. This also empowers people at village level for managing their economy through conservation friendly practices. The Plan should list the dependence based inventory of communities around the PA and prescribe institutional arrangements for eco-development.

In case of Marine Protected Areas (MPAs) and such other ecosystems, considering that the seascape environment is subject of community based resource use regimes, it is essential that while managing MPA's, community driven participatory mode of planning and management approach is given precedence. This would help in not only winning the support of the local community for conservation, but also would dove-tail strengthened financial mechanism in conserving the natural resources. In order to reach an equitable and effective MPA governance, it would also be pertinent to estimate the economic, social, cultural, and environmental values and incentives that are accrued from the MPA.

6.9. Soil and Water Conservation and maintenance of water points

PAs and Forests are the catchments and birthplaces for many streams and rivers. It is therefore imperative to conserve soil and moisture in these areas. These also act as water points for wild animals. These measures help to control runoff and prevent loss of soil by soil erosion, to reduce soil compaction, to maintain or to improve soil fertility, conserve or drain water and to harvest water. Thus they contribute to conservation of wildlife and overall habitat and ecology of the area. There should be efforts to carry out soil and moisture conservation works such as check-dams, gully plugging, percolation ponds. Dykes, catch water drains, earthen check dams according to site conditions. As far as possible the numbers and location of these structures with GPS locations shall be provided in the management plan prescriptions. However, the complete inventory of these structures along with the GPS locations carried out during the previous plan periods along with

the Schemes and those available prior to the notification of the PA should invariably be mentioned before prescribing new structures. This would not only help in identifying new sites but also help in restoring and maintenance of old structures.

Seed sowing of appropriate species and/or plantation of suitable species may also be prescribed to suite the requirement of habitat restoration and soil and moisture conservation.

6.10. Ecotourism

Following practices form the basic tenets of ecotourism and are to be analysed and planned with respect to the PA specific circumstances.

- Low-impact wildlife tourism that protects ecological integrity of forest and wildlife areas, Highlight the biodiversity richness, their values and their ecological services.
- Build environmental and cultural awareness and respect.
- Facilitate the sustainability of ecotourism enterprises and activities.
- Provide livelihood opportunities to local communities.
- Use indigenous, locally produced and ecologically sustainable materials for tourism logistics.

The Ministry of Environment, Forest and Climate Change has issued 'Guidelines on Sustainable Eco-Tourism in Forest and Wildlife Areas 2021' on 5th October, 2021 which shall be taken as reference. This theme prescription, if made shall include an ecotourism plan, ecotourism zonation, site development, community participation, communication and outreach, capacity building etc. as per the guidelines.

6.11. Prophylactic interventions/Prevention of zoonotic diseases and One health approach

There should be mention record of zoonotic diseases, if any, in the PA and further if any record of wildlife diseases should be mentioned in the management plan. Accordingly, the prescriptions in the management plan should align with the record and future impacts of such occurrences.

6.12. Disaster Risk Management

Certain PAs may be specifically vulnerable to disasters such as floods, cyclones, drought etc. The Management plan should contain the list of such disasters year wise along with the damage to the PA. These should be appropriately addressed in the management plan. A well-coordinated plan should find mention for such disaster in the plan. The prescription on Disaster Risk Reduction Management must include:

i. Vulnerability map based on prevalent criteria in the area.
ii. Measures for Disaster Risk Reduction in the context of identified vulnerabilities including those like extreme climatic events, disease outbreak, drought, floods etc.
iii. SOPs including the responsible stakeholders and partners in the Disaster Management efforts.

iv. Disaster proofing plans
v. Roles and strategic plans for community based action including communication, preparedness and skills for sustaining resilience.

6.13. Fire Management

A well laid out fire management plan should be prescribed for the PAs. A complete record of fires in the PA during the previous plan period should be mentioned. There should be fire hotspot mapping, fire vulnerability grading of various areas in the PA should be prepared. There shall be assessment of staff and infrastructure availability for firefighting. Various methods such as fire line creation, fire line maintenance, control burning etc. may be prescribed as per the site specificity.

6.14. Retrofitting Measures – Smart Green Infrastructure

There may be several infrastructure projects in the PA for which permissions may have been given by the CWLW on the basis of recommendations of the NBWL or SBWL before the mandatory requirement of linear passage plan. Such existing infrastructure projects should be mentioned in the plan. Therefore, efforts should be made to identify such existing projects and places based on the wild animal movement. On the basis of studies appropriate measures in these existing infrastructures may be identified with prescriptions for retrofitting them through the responsible authorities. Its impact after implementation should be recorded in mid-term appraisal.

6.15. Wetland Management

Wetlands are ecosystems located at the interface of land and water exists in various forms such as, marshes, lagoons, estuaries, mangroves, peatlands, ponds, lakes, reservoirs, floodplains and deltas. As highly productive ecosystems, wetlands are vital parts of the water cycle and support rich biological diversity and support a variety of ecosystem services: freshwater provision, food, fibre and fuels, groundwater recharge and purification, pollution abatement, flood mitigation, erosion control and carbon sequestration. They also provide cultural and recreational benefits. Wetlands directly and indirectly support the livelihoods of millions of people.

Many wetlands are threatened by reclamation and degradation through drainage and landfill, pollution, hydrological alteration, over-exploitation and climate change resulting in loss of biodiversity and disruption in ecosystem benefits to the society. Wetlands in India form an integral component of biodiversity conservation, water and food security and climate protection. Its active management through scientific prescription should be incorporated.

6.16. Management of Invasive Alien Species

The Wild Life (Protection) Act, amended in December 2022, defines invasive alien species as those that are “not native to India” and whose “introduction or spread may threaten or adversely impact wildlife or its habitat”.

Regulating the trade and movement of invasive alien species is the most effective way to prevent their introduction and spread. Once an invasive species arrives to a new area, it is possible to limit their negative impacts though early detection, monitoring and rapid eradication. A detailed prescription for its eradication should be planned in the Management Plan.

6.17. Cultural heritage management

There may be several sacred groves in the PA which should be mapped and mentioned in the plan. Important cultural significance should be depicted in the Management Plan and the prescriptions should be in consonance with the Act and the notification of the PA and/or resolutions of the conservation reserve management committee or community reserve management committee as the case may be.

6.18. Miscellaneous

Innovative themes may be encouraged which are in conformity with the Act.

7. INTEGRATING CLIMATE CHANGE ADAPTATION IN MANAGEMENT PLANNING

Forests, biodiversity and marine or freshwater environments are not only subjected to the impacts of climate change and global warming, but also can be instruments of mitigation as well as adaptation to the changes, which could be of direct negative consequences. While change of profile of ecosystems and life forms is a consequence, this also can be considered as an additional force for evolution as the pace of change of environmental factors causes edaphic and genetic stress, resulting changes in distribution and even may result in evolution and extinction of species.

The role of forest/biodiversity management in such situations become important to ensure that the shock of environmental changes due to climate change does not become too severe which can cause abrupt critical impacts on species or habitats. Management of natural resources to ensure that they are in the best state of natural profile has to be the main objective of management planning in such circumstances. Monitoring the changes in habitat profiles by regular schedules of observations in the network of the preservation plots should be the integral part of habitat monitoring. An effort should be made to map the achievement of Global Biodiversity Framework Targets.

Prescriptions for Climate mitigation

Adaptation normally seeks to reduce the risk posed by climate change such as flood, drought, forest fire, change in habitat diversity, emergence of IAS, disease spread, mortality of faunal & floral population migration of faunal biodiversity. Hence a study and climate impact should be recorded in the divisional note book and summary of past practices and future prescription can be recorded.

This however is needed to be at least a state wide coordinated long-term network of observations and analysis. A sustained series of observations and data only can be useful in achieving an understanding of the impacts and contribution of forest management in climate change adaptation.

8. ORGANIZATION AND ADMINISTRATION

The plan shall identify the requisite components of field staff required to serve the plan objectives and strategies. If necessary, redrawing of the beats, sections and ranges can be prescribed based on the convenience of management. Similarly, the staff strength can also be analyzed in view of the tasks prescribed and mandate of the administration.

Different management themes with their specific sets of objectives need manpower of desired skills, responsibilities and numbers. Accordingly, manpower planning is also vital in achieving the objectives of the Management Plan. The capacity needs of the staff including the PA manager should align with the objectives of the Management Plan.

9. THE SCHEDULE OF OPERATIONS AND MISCELLANEOUS REGULATIONS

Considering the future desired conditions, the priority goals, objectives and strategies, the activities in the plan have to be spread across annual targets as per the schedule of operations. These should be the basis of the Annual Plan of Operation (APO). Yearly priorities should be set out in the plan taking into account the seasonal influence on the area. The schedule of activities should be mentioned in such a way so as to suit the seasonal requirements and seasonal window available for implementation of the planned activities. Further, the schedule of operation of activities across the plan period should also be prioritized and planned to achieve the objectives set out for the period of the plan.

10. THE BUDGET

The management prescriptions made in the plan require budgetary support for their implementation. Therefore, year-wise projections for budgetary requirement during the plan period should be mentioned against each activity in the plan.

There are various sources of funding available for conservation and protection of wildlife inside and outside PAs as follows:

i. The Government of India provides financial support to the States and Union Territories (UTs) under the Centrally Sponsored Scheme – Integrated Development of Wildlife Habitats through which funds are provided for 'Development of Wildlife Habitats', 'Project Tiger' and Elephant'. Under the 'Development of Wildlife Habitats', there are three components wherein funding support is extended to the States/UTs wherein funds can be sought for conservation of wildlife and its habitat within PAs, outside PAs and Species Recovery Program. Presently, funding support under the Species Recovery Program is provided in case of 22 species which are - 1. Asian Wild Buffalo, 2. Asiatic Lion, 3. Brow-Antlered Deer or Sangai, 4. Dugong, 5. Edible Nest Swiftlet, 6. Gangetic River Dolphin, 7. Great Indian Bustard, 8. Hangul, 9. Indian Rhino or Great One-horned Rhinoceros, 10. Jerdon's Courser, 11. Malabar Civet, 12. Marine Turtles*, 13. Nicobar Megapode, 14. Nilgiri Tahr, 15. Snow Leopard, 16. Swamp Deer, 17. Vultures*, 18. Northern River Terrapin, 19. Clouded Leopard, 20. Arabian Sea Humpback Whale, 21. Red Panda and 22. Caracal (*entire group of species found in India). On the basis of recommendations made by the Standing Committee of the National Board for Wild Life, funding support under this scheme may be extended for recovery of other endangered species which shall be communicated to the States/UTs from time to time. Similarly, upon recovery of the species, it may be also excluded from the purview of financial assistance under the component of Species Recovery Program which shall be intimated to the States/UTs.

ii. Under the Compensatory Afforestation Fund Rules, 2018, financial assistance is available specifically for wildlife management from the money received towards net present value deposited in the State Fund and interest accrued on the money deposited in the State Fund such as voluntary relocation of villages from PAs, improvement of wildlife habitat as provided in the approved wildlife management plan, planting and rejuvenation of forest cover on non-forest land falling in wildlife corridors, establishment, operation and maintenance of animal rescue center and veterinary treatment facilities for wild animals, pest and disease control in forest, forest fire prevention and control operations, management of biological diversity and biological resource, strengthening of the forest and wildlife related infrastructure etc. in accordance with the rules and guidelines issued by the Central Government.

iii. Potential sources and amount of budgetary and extra budgetary resources from State Government Budget, Externally Aided Projects etc. should also be explored and utilized appropriately which may also include tourism related revenue available for conservation, those raised by the Foundations, CSR funding for support to the PA etc.

iv. Under CSR & CER (Corporate Environmental Responsibility) the industries situated in and around PAs should be asked to take part activity in the PAs management. District level fund mobilization must be explored and used.

11. ESSENTIALS OF MANAGEMENT

11.1. Maintenance of PA/Division Book

A PA Book (or PA Journal) shall be maintained that shall chronicle all events that have a bearing on the directions of the plan and prescriptions leading to management. While the best efforts are made to realize the targets because of the budgetary constraints including any late release of funds and other unforeseen difficulties, it might not always be possible to attain the desired levels of targets. These may, therefore, have to be shifted over time and some ultimately activities may even have to feature in the revised plan at the conclusion of the plan. To keep these in contention, a record of deviations need to be maintained in the PA Book. All deviations shall be substantiated by reasons and be approved in writing from the CWLW. Those deviations which are to be considered at the time of the revision of the plan should be listed. Apart from this, any event influencing the overall state of habitats or population of life forms, like any disease, a fire, landslides, earthquake, new sighting, new record, observation of migration etc. shall be recorded so that these facts are accounted for future revision of the plans. In case of any new infrastructure development in the vicinity like highway, transmission lines, dams, power projects, such areas should also be recorded.

11.2 Maintenance of control forms

Control forms are very important in recording management related information on an annual basis. These allow capture of annual trends in habitats/resources, in keeping track of events and activities. Formats for these are already available.

11.3 Maintenance of compartment histories

This system is an important tool for documentation of the resources/habitats for monitoring events, activities and trends that have immediate bearing on planning and managing given areas. Compartment histories, should be duly complete with new information to be maintained and updated on an annual basis and for putting these to their intended use. The record shall be maintained on a GIS platform accompanied by descriptions.

Where the system of compartments does not exist, then convenient portions of a beat defined by physical features, mapped and numbered may be considered for the purpose of compartments. The terrestrial and vegetation/habitat components of inland wetlands and coastal and marine PAs for the purpose of recording data shall be treated likewise.

The format/template for preparation of the management plan appears at PART C of these guidelines. Specific separate formats have been designed for National Parks and Sanctuaries, Marine PAs, Conservation Reserves and Community Reserves. The format for the National Parks and Sanctuaries has been described in details from where the relevant details in the other formats shall flow unless specified in the particular format. **A technical narrative and rationale for the planning process is provided in the next section (Part B).**

PART B: TECHNICAL NARRATIVE FOR THE TEMPLATE

12. BASIC APPRAISAL

A broad appraisal, covering the themes indicated below, is a pre-requisite for protected area management planning:

12.1 Legal aspects and extant action plans

12.1.1 Important legislations

Apart from loss of the land in-vogue the following legislations are crucial to a protected area management planning in the Indian context:

i. The Wild Life (Protection) Act, 1972 (read with subsequent amendments including December 2022)
ii. The Indian Forest Act, 1927
iii. The Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980
iv. The Biological Diversity Act, 2002
v. The Environment (Protection) Act, 1986
vi. The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act (FRA), 2006
vii. The Indian Penal Code, 1860
viii. Civil Procedure Code, 1908
ix. Prevention of Cruelty to Animals Act, 1960
x. Customs Act, 1962
xi. Air (Prevention and Control of Pollution) Act, 1981
xii. Water (Prevention and Control of Pollution) Act, 1974
xiii. Water (Prevention and Control of Pollution) Cess Act, 1974
xiv. Territorial Water, Continental Shelf, Exclusive Economic Zone and other Maritime Zones Act, 1976
xv. Maritime Zones of India (Regulation and Fishing by Foreign Vessels) Act, 1980
xvi. Foreign Trade (Development and Regulation) Act, 1992
xvii. Import and Export (Control) Act, 1947
xviii. Fisheries Act, 1897
xix. Marine Products Export Development Authority Act, 1972
xx. Panchayats Extension to Scheduled Area (PESA) Act, 1996
xxi. Town and Country Planning Act of the State
xxii. Land Revenue Code of the State
xxiii. National Wildlife Action Plan 2017-31
xxiv. Biogeographic Zones in India (Rodgers and Panwar 1988)
xxv. National Action Plan on Climate Change (NAPCC)
xxvi. Convention on Biological Diversity (CBD)
xxvii. Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)
xxviii. Directives from the Hon'ble Apex Court
xxix. Decisions of National Board for Wild Life
xxx. Decisions of the State Board for Wild Life

12.1.2 Ascertaining whether the protected area has been finally notified

This becomes important for prescribing actions relating to implementation of Sections 18-35 of the Wild Life (Protection) Act, 1972

12.1.3 Ascertaining whether the Ecologically Sensitive Zone (ESZ) has been finally notified for the protected area

The peripheral ESZ requires a zonal masterplan and hence it becomes important to highlight mutually complementary/sustainable actions in the protected area (national park/sanctuary) and the peripheral ESZ.

12.1.4 Continuance of rights

Under Section 24(2)(c) of the Wild Life (Protection) Act, 1972 certain rights may be allowed to continue in a sanctuary. However, the same is not applicable to a national park.

12.1.5 Alternative arrangements for people residing in protected areas vis-à-vis implementation of Sections 19 to 24

Under Section 18A (2) of the Wild Life (Protection) Act, 1972 it is a legal requirement to make alternative arrangements for persons affected under Section 19 to 24 of the said Act, till the final settlement of their rights. This should form part of prescriptions.

12.1.6. 2022 amendment to the Wild Life (Protection) Act, 1972

Our national legislation of wildlife, the Wild Life (Protection) Act, 1972, vide Section 33 provides for "control of sanctuaries", which empowers the Chief Wildlife Warden of a State to control, manage and maintain all sanctuaries, (applicable to national parks as well) vide Section 35(8). In the recent amendment to the said legislation in 2022, Section 33 has been amended to include: *"manage and protect all sanctuaries in accordance with such management plans for the sanctuary approved by him as per the guidelines issued by the Central Government and in case the sanctuary also falls under the Scheduled areas or areas where the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 is applicable, in accordance with the management plan for such sanctuary prepared after due consultation with the Gram Sabha concerned".*

12.1.7 Notifying the critical wildlife habitat

Under the FRA, notification of critical wildlife habitat is a statutory requirement. A methodology in the context is suggested in **Section 4** of the instant guidelines.

12.1.8 Orders from the Hon'ble Apex Court

The following orders from the Hon'ble Apex Court are relevant in the context of protected area management:

1. T.N. Godavarman Thirumulpad V/s Union of India and Others: 14-02-2000, 13-11-2000, 09-05-2002, 16-12-2002, 25-11-2005, 14-09-2007, 03-06-2022, and 26-04-2023….

The above Civil Writ Petition (No.202 of 1995), commonly known as the 'Godavarman Case' has been going on for the last 15 years and is a 'continuing mandamus'. The Supreme Court of India has been passing orders with directions in the said case to monitor conservation of forests and wildlife. A complete ban on felling of trees in all 'forests' was ordered by the Apex Court on 12.12.1996, which was not applicable to trees which had been planted and grown, and were not of spontaneous growth in areas which were not forests earlier. The forests were also defined according to its dictionary meaning. In another public interest litigation [the Centre for Environment Law (CEL)-WWF-India], the Apex Court issued directives on settlement of rights under Section 31 of the Wild Life (Protection) Act, 1972.

Besides, time and again, directives have been issued vis-à-vis public interest litigations on various issues relating to protected area management, inter alia, covering:

i. Special authority for protected area supervision
ii. Investigation on wildlife trade to Central Bureau of Investigation
iii. Tiger Censes
iv. Specifying activities permitted in protected areas (habitat improvement activities, fire protection, management of wet grasslands, communication and protection measures and anti-poaching activities)
v. Control over poaching
vi. Immunisation of livestock
vii. Fund availability
viii. Diversion of forest land for non-forest use from protected areas (the procedure involves the approval of the Apex Court after clearance of the proposal from the National Board for Wildlife through its Standing Committee), with payment of net present value and compensatory afforestation by the proponent.
ix. No de-reservation of forests, Sanctuaries and National Parks.
x. No cutting of bamboos and cane in national parks and sanctuaries

Enumeration of activities permitted by the Apex Court in protected areas (WWF-India and ELDF, 2009-a and 2009-b):

i. Habitat improvement activities (weed eradication, maintenance and development of meadows/grasslands for wild herbivores, digging and maintenance of small water-holes and small anicuts/earthen tanks, impoundment of rain water, village relocation and improvement of habitat from areas vacated due to village relocation)
ii. Fire protection measures (clearance/maintenance of firelines as per Management Plan, controlled cool/early burning, construction of water towers)
iii. Management of wet grassland habitat (cool/early control burning of grasslands in habitats such as Kaziranga and Manas to facilitate fresh grass growth)
iv. Communication and protection measures (construction of wireless towers, improvement and maintenance of fair weather non-tar roads not exceeding 3 meters in width, small bridges, culverts, fences)

v. Anti-poaching activities (construction, maintenance of small anti-poaching camps/chowkies, patrolling camps, check post barriers, boundary walls, construction of small staff quarters for frontline staff)
vi. Activities prohibited in forest areas:

    a. Felling of trees and their removal
    b. Removal of bamboo or grasses for any purpose
    c. Removal of corals and other living forms from marine national parks/sanctuaries
    d. Construction of tourist complexes, hotels and restaurants, zoos and safari parks with any other building that have no direct use for management of wildlife and its habitat

Subsequently, some non-commercial activities have been permitted within forest areas, which include:

i. Weed removal
ii. Clearing/burning for firelines
iii. Fair weather road maintenance
iv. Digging, habitat improvement, creation of temporary waterholes
v. Construction of *chowkies*, anti-poaching camps etc. for supervision of forest by the Forest Department
vi. Laying of underground drinking water pipelines up to 4 inches diameter
vii. Laying of 11 KV distribution lines for electricity supply to rural areas
viii. Providing wells, hand pumps, small water tanks etc. for drinking water to villagers for yet to be relocated from protected areas
ix. Creation of Anganwadies, government schools, government dispensaries essential for people living near forest areas (without cutting or felling of trees)

The activities permitted in the context of protected areas are to be undertaken as per the approved Management Plan, consistent with the provisions of the Wild Life (Protection) Act, 1972 and the National Wildlife Action Plan. They should also be in conformity with the guidelines issued for the management of protected areas from time to time. The construction and related activities should be designed for merging with the natural surroundings with forest friendly material.

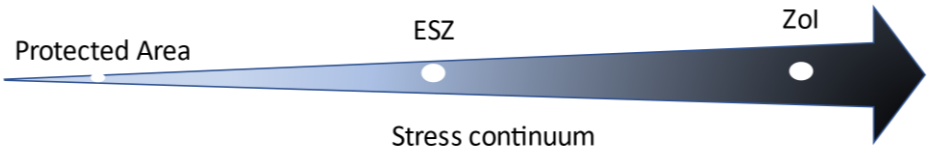
In cases involving diversion of land in protected areas, it become essential for the proponent to obtain approval under the Forest Conservation Act, 1980, besides payment of 5% of the project cost in the compensatory afforestation fund towards conservation and protection works in the protected area. In addition, the payment of 'Net Present Value' (NPV) at the present rate is also required with an undertaking that additional NPV, if determined by the Apex Court would be paid by the project proponent, who would also be required to adhere to any other condition(s) that would be laid by the Ministry of Environment and Forests while granting approval.

12.2 Size, shape and proximity of the protected area

Empirical findings indicate that large protected areas contain larger populations of each wildlife species, when compared to smaller areas. Area is important for long term viability of wildlife populations. Protected areas stand out as islands of the original biological community in a vast matrix of unsustainable landuses. Broadly, the management plan needs to ensure:

- Actions for protection/revival of all trophic levels, envisioning a peripheral Zone of Influence (ZoI) based on a anthropogenic disturbance gradient amounting to double the size of the protected area for landscape level engagement.
- Revival of inherent corridor linkages restore their functionality envisioning a regional management of protected areas within the State by strengthening linkages, while focusing on gainful community stewardship and multistakeholder engagement within the envisioned ZoI for mainstreaming wildlife concerns.

Stress gradient from a protected area



12.3 Knowing landscape level disturbance regimes in and around the protected area

It is important to make an appraisal of prevailing disturbance regimes in the protected area landscape (upto a radial distance of 10 km from the PA boundary). Remotely sensed data in the GIS domain needs to be used for integrating spatial and non-spatial information to provide a time series analysis relating to forest/habitat disturbance. The indices generated from such analysis should include: fragmentation, patchiness, porosity, interspersion, juxta position, biotic disturbance, and disturbance index. Based on the same protected areas of the State can be grouped under several categories of fragmentation status to enable interventions.

12.4 Other points for consideration

- Action Plans of MoEF&CC:
  - Vulture Conservation in India (2020-25)
  - Project Dolphin – comprehensive action plan (2021-45)
  - Project Lion: lion@2047: a vision for Amrit Kaal
  - The Owl Conservation Plan (2023 – 2032)
- Eco-Friendly measures to mitigate impacts of linear infrastructure on wildlife (WII, 2016)

- National Human-Wildlife Conflict Management Strategy and Action Plan of India, 2021-26 (MoEF&CC, 2021)
- Guidelines and determination and notification of Critical Wildlife Habitats within National Parks and Sanctuaries (MoEF&CC, 2017)
- Power-line mitigation to conserve bustards (WII, 2018)
- National Mission For A Green India (MoEF&CC, 2021)
- India's National Action Plan for Conservation of migratory birds and their habitats along Central Asian Flyway (2018-23)
- Special focus: species recovery program of MoEF&CC (twenty two critically endangered): Hangul, Snow Leopard, Bustard including Floricans, Dolphin, Nilgiri Tahr, Marine turtles, Dugong, Edible-nest swiftlet, Asian Wild Buffalo, Nicobar megapode, Manipur Brow-antlered deer, Vultures, Malabar civet, One- horned rhinoceros, Asiatic lion, Swamp deer, Jerdon's Courser, Batagur Baska, Clouded Leopard, Red Panda, Caracal, Arabian Sea Humpback Whale
- Other species warranting special focus: Western tragopan
- MoEF&CC guidelines relating to "Integrated Development of Wildlife Habitats"
- The Wetlands (Conservation and Management) Rules, 2017 (MoEF&CC)
- Rules made under the Wild Life (Protection) Act, 1972 (MoEF&CC)
- Rules made by State Government (Under the Wildlife Protection Act, 1972)
- Rules made by MoEF&CC (Under the Indian Forest Act, 1927)
- Rules made by State (Under State Forest Acts)
- Rules and guidelines made under the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 (MoEF&CC)
- Special requirements of wildlife species
- Status of meso-predators
- Socio economic status of peripheral landscape
- Prevailing Human-Wildlife Conflict (HWC)
- Whether the protected area has a relocation history
- Conservation history and forestry operations in the past
- Need for interstate/transnational co-ordination

- Whether the area is in a conflict landscape owing to extremist engineered disturbances
- Ecological carrying capacity of the protected area for herbivores
- Compliance of ecotourism guidelines
- Compliance of MEE findings, budgetary allocation, staff in position, extant normatives for protection and other field actions
- Overall wildlife status
- Scope for active management
- Climate smart actions
- One health: protected areas serving as peripheral habitat to infectious diseases
    - maintaining high diversity of vertebrate community (host for arthropod vectors to reduce human risk)
    - pathogen reservoirs are low diversity communities dominating human impacted areas
    - generalist vectors transmitting pathogens to humans have high feeding rates on such reservoirs resulting in high prevalence of infection in vectors
    - contrastingly high native vertebrate diversity provides a variety of hosts to vectors like tick/mosquito, most of which are poor pathogen reservoirs leading to low infection prevalence
    - protected areas/forest habitats with high diversity of vertebrates (poor pathogen reservoirs) safeguard/buffer zoonotic infections between urban and agro pastoral rural areas
    - identification of biodiversity scoring of land parcels (urban and rural along with forest interface) is important for hot spot mapping in the context (low to nil biodiversity score land parcels, proximal to human settlements, are potential hotspots for pandemic spread)
    - a landscape approach within the Zone of Influence has envisaged in the instant guidelines provides ample opportunity for taking adequate buffering actions against zoonotic disease spread to humans
    - the “one health” approach is based on the fact that human-animal-environmental health are interlinked, warranting a coordinated, multidisciplinary cross sectoral approach to address risks originating at animal-human-ecosystem interface. This calls for

preventing environmental loss to reduce zoonotic outbreaks, with well managed protected areas/forests (terrestrial and marine) forming biodiversity hubs

13. OVERVIEW OF THE STRATEGY AND ACTION PORTFOLIOS

13.1 Strategy

The overall strategy is based on a centrifugal vision from the protected area, to forge ecologically viable, mutually gainful partnerships with all stakeholders operating in the protected area landscape to ensure sustainable conservation.

The above envisioning requires to consider wildlife as a proxy/surrogate indicator of:

- Economic growth/green development
- Ecosystem services to society
- Ecosystem sustainability linked to human well being
- Adaptation to climate change
- Pandemic buffering (dilution effect of forests in protected area and beyond)

Thus, action portfolios in sync with the above would involve an active and "exclusive" wildlife agenda within the protected area (Ecosystem approach), complemented by an equally active **"co-occurrence"** agenda in the ZoI, subsuming the ESZ, the latter being covered by zonal masterplan actions. Co-occurrence action portfolios would be in sync with ESZ zonal masterplan.

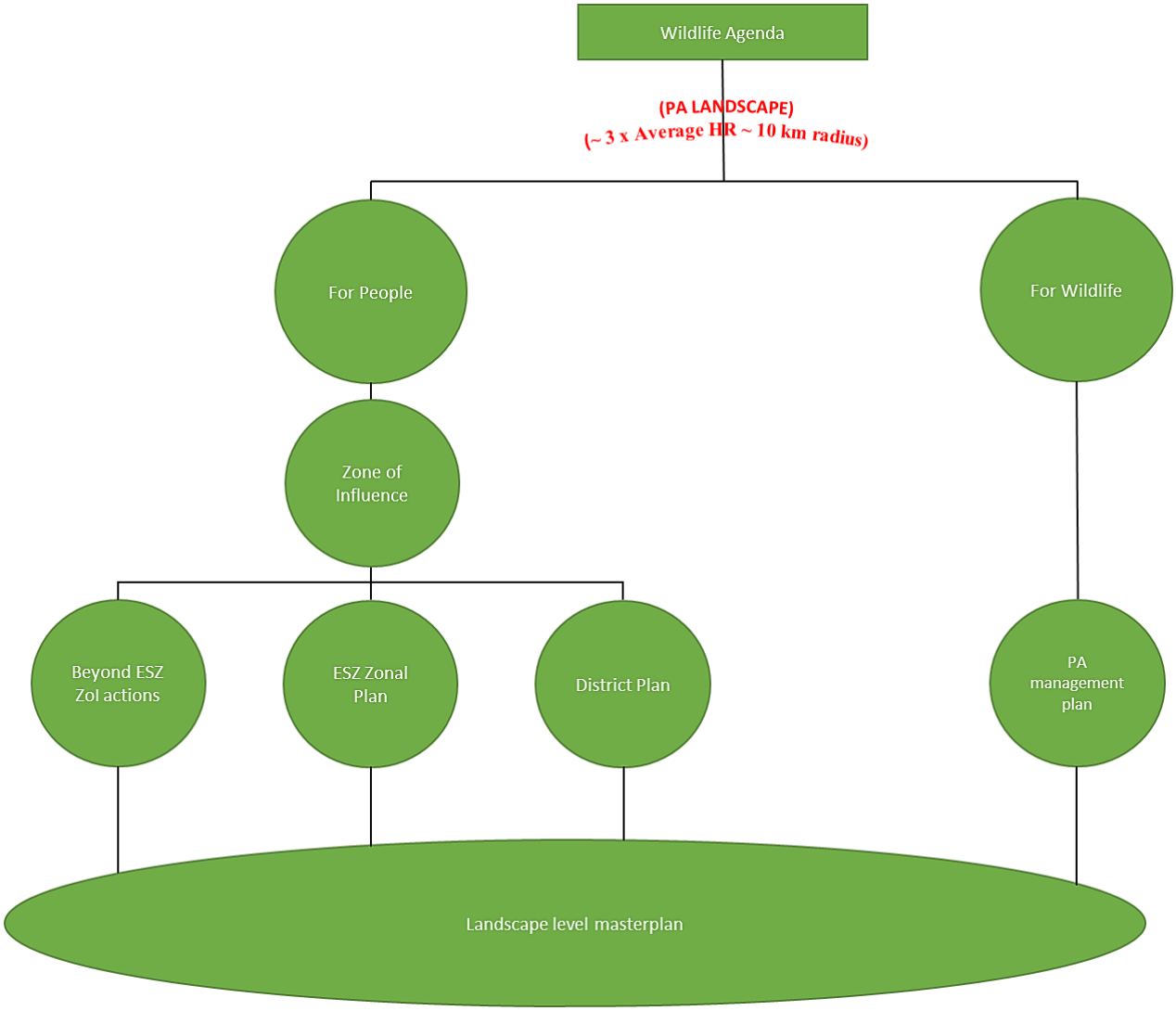


Figure 13.2: Strategy at a glance

The above centrifugal landscape level strategy would address three broad categories of land parcels at a macro scale, viz. forests, rural, and urban, along with their mutual interfaces. A conceptual diagram is provided below:

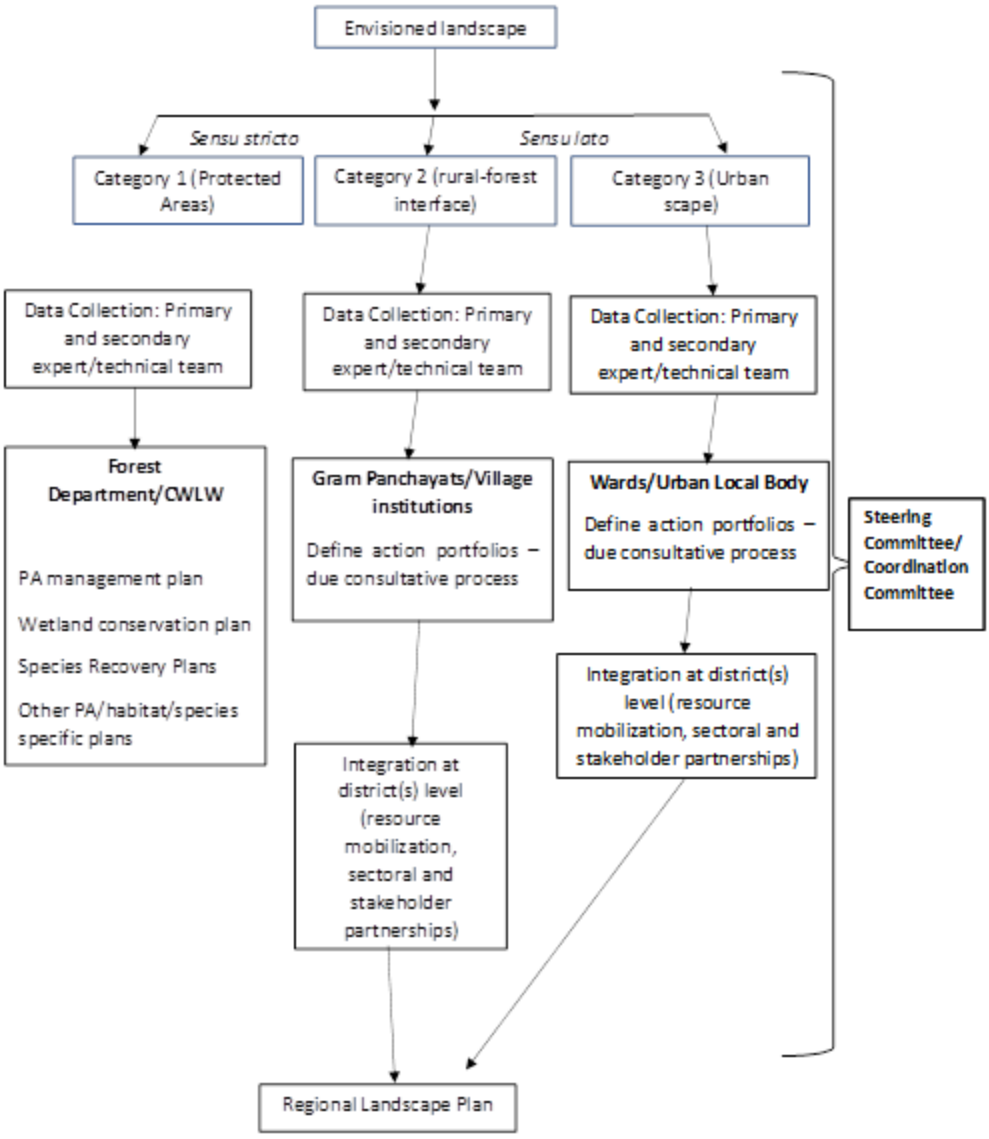


Figure 13.3: Protected area landscape: master planning for integration (conceptual)

13.2 Action portfolios

13.2.1 Protected Area

The protected area action portfolios may be broadly divided into two categories:

1. Archetypal actions (typical field actions for protection, habitat, monitoring and related themes)
2. Differentiated actions (typical to a protected area as per SWOT)

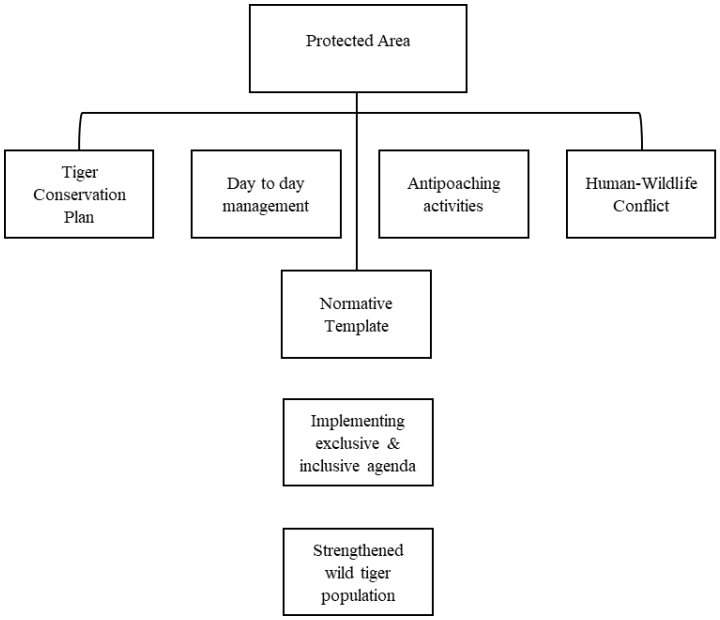


Figure 13.4: Archetypal Actions for Wildlife Conservation

Figure 13.5: Wildlife Governance in Atypical Situations

Themes for a protected area management plan are broadly indicated below vis-à-vis an ecosystem approach:

"Exclusive" Wildlife Agenda: for Strengthening

- Field protection and state of the art patrolling (M-STRiPES)
  - security planning
  - security audit
  - information networking
  - refining protection normative
  - strengthening surveillance using technology
  - leg work normative
  - drone/chopper surveillance
  - wireless networking
  - deployment of local workforce to complement frontline
  - re-organisation of beats to strengthen effective patrolling
  - transboundary joint actions
- Habitat actions
  - computing habitat carrying capacity for herbivores/carnivores
  - limiting habitat actions within ecological carrying capacity
  - appraisal of resource gradient during pinch period and other seasons
- Fire protection
  - preventive and control measures using remotely sensed data for alerts
- Flood protection
  - preventive and control measures technology based alerts
- Wetland conservation
  - monitoring water quality, biodiversity
  - GIS based monitoring using remotely sensed data (time series) to track fragmentation
  - in-situ efforts for flora and fauna
- Monitoring
  - state of the art monitoring protocol
  - creation of beat level repository (floral/faunal database/compartment profile)
  - round the year monitoring using camera traps
- Disease surveillance
  - Cattle immunization in collaboration with local veterinary department
  - Maintaining immunized buffer against contiguous disease
  - Year round tracking of disease spread vis-à-vis pastoral movements
- Human-wildlife conflict
  - Setting up 24x7 control room linked to Rapid Response Teams (RRT)
  - Deployment of elephant squads
  - Preventive and control measures in sync with NTFP collection

    - Gainful community stewardship for monitoring livestock depredation
    - Creating IDs of wild animals operating in the interface (elephant, leopard)
    - Capacity building of frontline and community stewards in rescuing wild animals in distress
    - Use of radio telemetry for addressing conflict situations
    - Creation of in-situ rewilding centre
    - Creating village clusters level radio hubs for day to day (hourly) alerts
- Active management within biological carrying capacity
    - prey predator revival
- Regulation for tourist visitation
- Securing inviolate space within a timelines

- Differentiated approach: LWE/conflict prone areas

The above actions may be "zonated" area wise, or can be implemented as **"overlapping theme plans"**

13.2.2 Zonal plan for ESZ

The Eco-Sensitive zone of a protected area is notified by the Ministry of Environment, Forests and Climate Change, Government of India, in consultation with respective State governments under Section 3 of the Environmental (Protection) Act, 1986. This is done to conserve and protect the Wildlife Sanctuary/National Park.

The said notification necessitates preparation of a Zonal Master Plan within a period of 2 years from the date of its publication. It has also been stated that the Master Plan should be prepared in consultation with all concerned State Departments, *viz.*

- Environment
- Forest
- Urban Development
- Tourism
- Municipal Corporation
- Revenue
- Agriculture
- Irrigation
- Public Works Department
- Wetland management & development
- Management & Invasive alien species

The said zonal master plan needs to provide for restoration of denuded areas, conservation of existing water bodies, management of catchment, watershed management, ground water management, soil and moisture conservation, needs of local community and other aspects of

ecology and environment. Further, there is a provision for demarcating existing worshiping places, villages, urban settlements, forest types, tribal areas, agricultural areas, fertile land, green areas like parks, horticultural sites, orchards, lakes, wetlands, and other water bodies, while regulating development within the zone, vis-à-vis the notification.

The above notification has important prescriptions for land use, natural springs, eco-tourism, natural heritage, noise pollution, man-made heritage sites, air pollution, discharge of affluent, solid waste, biomedical waste, plastic waste management, construction/demolition, waste management, e-waste, vehicular traffic and industrial units. A list of prohibited/regulated/permitted activities has been provided apart from the constitution of a monitoring committee with terms of reference.

Thus, the zonal masterplan for a notified ESZ is a landscape level strategy for cross and intersectoral integrations apart from engagement with all stakeholders to safeguard biodiversity. The prohibited, permitted and regulated activities are highlighted below:

13(A) MOEF&CC GUIDELINES FOR DECLARATION OF ECO-SENSITIVE ZONES AROUND NATIONAL PARKS AND WILDLIFE SANCTUARIES
(F.No.1-9/2007- WL-I (pt) dated 9th February, 2011)

1. Background:

1.1 IBWL Decision:

1.1.1 During the XXI meeting of the Indian Board for Wildlife held on 21st January 2002, a "Wildlife Conservation Strategy-2002" was adopted wherein point no.9 envisaged that "lands falling within 10 kms of the boundaries of National Parks and Sanctuaries should be notified as eco-fragile zones under Section 3(v) of the Environment (Protection) Act and Rule 5 Sub rule (viii) & (x) of the Environment (Protection) Rules".

1.1.2 The Additional Director General of Forests (WL), vide letter dated 6th February 2022, had requested all the Chief Wild Life Wardens for listing out such areas within 10 kms of the boundaries of National Parks and Sanctuaries and furnish detailed proposals for their notification as eco-sensitive areas under the Environment (Protection) Act, 1986.

1.1.3 In response, some of the State Governments had raised concerns over applicability of the 10 kms range from the Protected Area boundary and informed that most the human habitation and other areas including important cities in these States would come under the purview of eco-sensitive zone and will adversely affect the development.

1.2 National Wildlife Action Plan

1.2.1 The National Wildlife Action Plan (NWAP) 2002-2016 indicates that *"Areas outside the protected area network are often vital ecological corridor links and must be protected to prevent isolation of fragments of biodiversity which will not survive in the long run. Land and water use policies will need to accept the imperative of strictly protecting ecologically fragile habitats and regulating use elsewhere."*

1.2.2 The Action Plan also indicates that *"All identified areas around Protected Areas and wildlife corridors to be declared as ecologically fragile under the Environment (Protection) Act, 1986."*

1.2.3. Under National Wildlife Action Plan (2017-2031), following important highlight listed. Which will be guiding principle for management prescription.

1.2.3.1 For ease of monitoring and evaluation, the new plan has been drafted on –similar lines as the second plan. Most of the chapter headings of NWAP-2 have been retained as such. However, in view of the changed circumstances, a few chapters have been modified and a few ones have been added.

1.2.3.2 The Plan is based on the premise that essential ecological processes that are governed or strongly moderated by ecosystems are essential for food production, health and other aspects of human survival and sustainable developments. The maintenance of these ecosystems, which can be termed as 'Life Support Systems; is considered vital for all societies regardless of their stage of development.

1.2.3.3 It also emphasizes on two other aspects of nature conservation viz. preservation of genetic diversity and sustainable utilization of species and ecosystems, which have a direct bearing on our scientific advancements and support to millions of rural communities.

1.2.3.4 The plan adopts a landscape approach in conservation of all wildlife i.e. uncultivated flora and undomesticated fauna that have an ecological value to the ecosystem and to mankind irrespective of where they occur.

1.2.3.5 It accords special emphasis to recovery of threatened species of wildlife while conserving their habitats which include terrestrial inland aquatic, coastal and marine ecosystems.

1.2.3.6 It takes note of concerns relating to climate change on wildlife, by integrating actions to be taken for its mitigation and adaption into wildlife management planning.

1.2.3.7 It underlines the fact that despite being one of 17 mega biodiversity countries of the world national planning has not taken serious note of adverse ecological consequences of reduction and degradation of wilderness areas from the pressures of population, commercialization and development projects. Accordingly, the plan has brought to focus the alarming erosion of our natural heritage comprising of rivers, forests, grasslands, mountains, wetlands, coastal and marine habitats, arid lands and deserts.

1.2.3.8 The plan underscores the increasing need for people's support for conservation to wildlife and to this higher input for eco-development, education, innovation, training, extension, conservation awareness and outreach programs. Wildlife health and disaster management have received due attention in this plan.

1.3 Decision of National Board for Wild Life:

1.3.1 Considering the constraints communicated by the states, the proposal was re-examined by the National Board for Wild Life in its 2nd meeting held on 17th March 2005 and it was decided that the **'delineation of eco-sensitive zones would have to be site specific and relate to regulation, rather than prohibition, of specific activities'.** The decision was communicated to

all the State Governments for compliance vide letter dated 27th May 2005. Thereafter, it was further communicated with subsequent reminders.

1.3.2 Decisions of the Standing Committee of the National Board for Wild Life

1.3.3 Decisions of the State Board for Wild Life

1.4 Hon'ble Supreme Court's decision:

1.4.1 A Public Interest Litigation was also filed by the Goa Foundation vide their Writ Petition No.460/2004 before the Hon'ble Supreme Court regarding the issue of declaration of eco-sensitive zones.

1.4.2 Vide their order dated 4th December 2006, Hon'ble Supreme Court had directed the Ministry of Environment & Forests to give a final opportunity to all States/Union territories to respond to the letter dated 27.5.2005 and that the State Governments send their proposals within four weeks, to the Ministry. It was also directed that all cases where environmental clearances were granted where activities are within 10 kms zone, be referred to Standing Committee of NBWL.

2. Statutory Provisions

2.1 *Section 5C (1) of the Wild Life (Protection) Act, 1972 states that it shall be the duty of the National Board for Wild Life to promote the conservation and development of Wildlife and forests by such measures as it thinks fit.*

2.2 *Section 3 of the Environment (Protection) Act 1986 (EPA) gives power to the Central government i.e. the Union Ministry of Environment and Forests to take all measures that it feels are necessary for protecting and improving the quality of environment and to present and control environmental pollution. TO meet this objective, the Central Government can restrict areas in which any industries, operations or processes or class of industries, operations or processes shall not be carried out or shall be carried out subject to certain safeguards [Section 3(2)(v)]*.

2.3 *Section 5(1) of the Environment (Protection) Rules, 1986 (EPR), states that the central government can prohibit or restrict the location of industries and carrying on certain operations or processes on the basis of considerations like the biological diversity of an area (clause v) maximum allowable limits of concentration of pollutants for an area (clause ii) environmentally compatible land use (clause vi) proximity to protected area (clause viii).*

3. Purpose for declaring Eco-Sensitive Zones:

The purpose of declaring Eco-Sensitive Zones around National Parks and Sanctuaries is to create some kind of "Shock Absorber" for the Protected Areas. They would also act as a transition zone from areas of high protection to areas involving lesser protection. As has been decided by the National Board for Wild Life, the activities in the Eco-Sensitive Zones would be of a regulatory nature rather than prohibitive nature, unless and otherwise so required.

4. Extent of Eco-Sensitive Zones:

4.1 Many of the existing Protected Areas have already undergone tremendous development in close vicinity to their boundaries. Some of the Protected Areas actually lying in the urban setup

(Eg. Guindy National Park, Tamil Nadu, Sanjay Gandhi National Park, Maharashtra, etc.). Therefore, defining the extent of eco-sensitive zones around Protected Areas will have to be kept flexible and Protected Area specific. The width of the Eco-Sensitive Zone and type of regulations will differ from Protected Area to Protected Area. However, as a general principle the width of the Eco-Sensitive Zone could go upto 10 kms around a Protected Area as provided in the Wildlife Conservation Strategy-2002.

4.2 In case where sensitive corridors, connectivity and ecologically important patches, crucial for landscape linkage, are even beyond 10 kms width, these should be included in the Eco-Sensitive Zone.

4.3 Further, even in context of a particular Protected Area, the distribution of an area of Eco-Sensitive Zone and the extent of regulation may not be uniform all around and it could be of variable width and extent.

5. Need for guidelines:

5.1 As has been indicated vide para 1.4 above, Hon'ble Supreme Court has vide their order dated 4th December 2006 directed all the State/Union Territory Governments to forward proposals for declaration of eco-sensitive zones around its Protected Areas. However, only States like Haryana, Gujarat, Mizoram, Meghalaya, Assam, Goa have forwarded proposals. However, several other States/Union Territories have not come forward, perhaps for want of guidelines in this regard.

5.2 In this context, it is pertinent to note here that Hon'ble Supreme Court vide their judgement dated 3rd December 2010 in the case relating to the construction of park at NOIDA near Okhla Bird Sanctuary filed by Shri Anand Arya & Anr vs. Union of India (I.A. Nos. 2609-2610 of 2009) in Writ Petition (Civil) No.202/1995, had noted that the State Government of Uttar Pradesh had not declared Eco-Sensitive Zones around its Protected Areas as the Government of India had not issued any guidelines in this regard.

5.3 The Ministry of Environment & Forests had set up a committee under the Chairmanship of Shri Pronab Sen for identifying parameters for designating Ecologically Sensitive Areas in India. The said Committee had identified parameters for declaration of specific units of land/water etc. as Ecologically Sensitive Zones based on parameters like richness of flora & fauna; slope; rarity & endemism of species in the area; origins of rivers etc. However, these parameters do not basically apply to the Eco-Sensitive Zones in the instant context, i.e., around Protected Areas. In the instant case, the Eco-Sensitive Zones are meant to act as a "Shock absorbers"/"transition zone" to the Protected Areas by regulating and managing the activities around such Protected Areas.

6. The procedure to be adopted:

6.1 As has been indicated in the forgoing paras, the basic aim is to regulate certain activities around National Park and Wildlife Sanctuary so as to minimize the negative impacts of such activities are on the fragile ecosystem encompassing the Protected Area. As a first step towards achieving this goal, it is a pre-requisite that an inventory of the different land use patterns and the different types of activities, types and number of industries operating around each of the Protected Area (National Parks, Sanctuaries) as well as important Corridors be made. The inventory could be done by the concerned Range Officers, who can take a stock of activities within 10 km of his range.

6.2 For the above purpose, a small committee comprising the concerned Wild Life Warden, an Ecologist, an official from the Local Self Government and an official of the Revenue Department of the concerned area, could be formed. The said committee could suggest the:

(i) Extent of eco-sensitive zones for the Protected Area being considered.
(ii) The requirement of such a zone to act as a shock absorber
(iii) To suggest the best methods for management of the eco-sensitive zones, so suggested.
(iv) To suggest broad based thematic activities to be included in the Master Plan for the region.

6.3 Based on the above, the Chief Wild Life Warden could group the activities under the following categories (an indicative list of such activities is attached as **Annexure-1)**:-

(i) Prohibited
(ii) Restricted with safeguards
(iii) Permissible

6.4 Once the proposal for Eco-Sensitive Zones has been finalized, the same may be forwarded to the Ministry of Environment and Forests for further processing and notification. Here, it may be noted that, the State/Union Territory Forests Department could forward the proposals to the respective authority in the State Government with copy to the Ministry of Environment and Forests, as and when the proposals (even if it is for single Protected Area) are complete. An indicative list of details that need to be submitted along with the proposals is at **Annexure-2.**

6.5 It is to mention here that in cases where the boundary of a Protected Area abuts the boundary of another State/Union Territory where it does not form part of any Protected Area, it shall be the endeavour of both the State/Union Territory Governments to have a mutual consultation and decide upon the width of the Eco-Sensitive Zone around the Protected Area in question.

6.6 The State Government should endeavour to convey a very strong message to the public that ESZ are not meant to hamper their day to day activities, but instead, is meant to protect the precious forests/Protected Areas in their locality from any negative impact, and also to refine the environment around the Protected Areas.

7. These guidelines are indicative in nature and the State/Union Territory Governments may use these as basic framework to develop specific guidelines applicable in the context of their National Parks, Wildlife Sanctuaries, important corridors, etc. with a view to minimizing and preferably eliminating any negative impact on protected areas.

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Annexure-1

Identification of Activities

While some of the activities could be allowed in all the eco-sensitive areas, others will need to be regulated/prohibited. However, which activity can be regulated or prohibited and to what extent, would have to be PA specific. A broad list of activities (this may need supplementation) which could be allowed, promoted, regulated or prohibited is given in the table below:

S.No.	Activity	Prohibited	Regulated	Permitted	Remarks
1.	Commercial Mining	Y			Regulation will not prohibit the digging of earth for construction or repair of houses and for manufacture of country tiles or bricks for housing for personal consumption
2.	Felling of trees		Y		With permission from appropriate authority
3.	Setting of saw mills	Y			
4.	Setting of industries causing pollution (water, air, soil, noise, etc.)	Y			
5.	Establishment of hotels and resorts		Y		As per approved master plan, which takes care of habitats allowing no restriction on movement of wild animals
6.	Commercial use of firewood	Y			For hotels and other business-related establishment
7.	Drastic change of agriculture systems		Y		
8.	Commercial use of natural water resources including ground water harvesting		Y		As per approved master plan, which takes care of habitats allowing no restriction on movement of wild animals.
9.	Establishing of major hydroelectric projects	Y			
10.	Erection of electrical cables		Y		Promote underground cabling
11.	Ongoing agriculture and horticulture practices by local communities			Y	However, excessive expansion of some of these activities should be

					regulated as per the master plan
12.	Rain water harvesting			Y	Should be actively promoted
13.	Fencing of premises of hotels and lodges		Y		
14.	Organic farming			Y	Should be actively promoted
15.	Use of polythene bags by shopkeepers		Y		
16.	Use of renewable energy sources			Y	Should be actively promoted
17.	Widening of roads		Y		This should be done with proper EIA and mitigation measures
18.	Movement of vehicular traffic at night		Y		For commercial purpose
19.	Introduction of exotic species		Y		
20.	Use or production of any hazardous substances	Y			
21.	Undertaking activities related to tourism like over-flying the National Park area by any aircraft, hot air balloons	Y			
22.	Protection of hill slopes and river banks		Y		As per the master plan
23.	Discharge of effluents and solid waste in natural water bodies or terrestrial area	Y			
24.	Air and vehicular pollution		Y		
25.	Sign boards & hoardings		Y		As per the master plan
26.	Adoption of green technology for all activities			Y	Should be actively promoted

Annexure-2

General information to be incorporated in the proposals for declaration of Eco-Sensitive Zone around protected areas

(i) Delineation of the physical boundaries on a topo-sheet with precise description in geographic terms together with a description of the significant features/attributes that would potentially qualify the area as eco-sensitive zone. A description of the boundaries along with the list of villages with exception and exemption in the delineated peripheral habitat area.

(ii) An inventory of the existing legal status of rights, entitlements, privileges and obligations of the local communities.

(iii) A description of bio-diversity values including bio-geographical representatives, endemism, species richness, geo-morphological characteristics, and unique land use practices including aesthetic and cultural values.

(iv) A description of the resource base indicating the economic potential and livelihood implication for the people residing in and around the proposed eco-sensitive area.

(v) An inventory of activities to be regulated and/or prohibited in the proposed eco-sensitive zone.

(vi) List of the protected areas for declaring eco-sensitive zone.

13.2.3 Pre requisites for landscape strategy

1. Macro level (larger spatial scale)

- Appraisal for interventions at a larger spatial scale
    - Peripheral habitat area vis-à-vis the protected area size
    - Intensity (need to progressively increase from the source area boundary) of managerial effects across the peripheral habitat and corridor
    - Natural species composition
    - Age structure of forest stands
    - Presence of old stands /trees
    - Spatial heterogeneity (different patch sizes)
    - Edges and ecotones
    - Corridors (forest / non-forest cultivation giving cover/ nallah beds/ gulleys/ ravines/ culverts/ bridle paths)
    - Riparian zones
    - Unique habitats
    - Human settlements (villages/hamlets/rural towns, private estates, agriculture lands, tourism infrastructure, varied land uses, special projects, temples, rail/road infrastructure, mining, horticulture, thermal power plant, industries etc.)
    - Proximity / adjacency ratings between various non-forest covers and forest areas (as relevant – e.g. sugarcane cultivation to forest, villages, nallah bed etc. for computing juxtaposition / interspersion indices using GIS)

2. Micro level (finer spatial scale appraisal)

- Appraisal for interventions at a **finer spatial scale**
    - Ongoing forestry practices like selection / coppice system, plantation / JFM / bamboo working, collection of MFP
    - Appraisal of large gaps if any
    - Proximity of raised plantations to agricultural field
    - Ongoing bamboo working vis-à-vis tiger presence
    - Ongoing thinning and ungulate presence (wild /livestock)
    - Presence of seed bearers / old coppice growths
    - Species diversity (monoculture or otherwise)
    - Edge effect (inherent: natural openings / frost holes close to forest) (induced: presence of cover crops / young plantations close to forest)
    - Status of corridors (whether choked with infrastructure / settlements or free of them)
    - Human settlements, agriculture fields and their impact (beats / areas with rights and concessions)
    - Tourism infrastructure (location with respect to natural corridor)
    - Impact of varied land uses and projects (location of projects / infrastructure and their proximity to protected area)

FINE TUNING / MITIGATION STRATEGIES FOR VARIOUS SECTORS IN THE PERIPHERAL HABITAT

1. Forestry

- Ecosystem management required
- Ecological availability of a tree should be ascertained before removal
- A tree should be considered ecologically available if
- Its removal does not create a gap beyond 43 to45%.
- The regeneration of species at various formation levels within a radial distance of twice the crown radius of the tree being selected for felling should have an 'established' status.

Tree fellings/Thinnings

- No clear felling and other silvicultural systems promoting concentrated regeneration
- No conversion to uniform forests
- A high forest system with diffused regeneration should be preferred
- Status of regeneration should be an overarching consideration to permit felling
- Areas having considerable disturbance should not be felled

Tree fellings / Thinnings

Canopy class and wild dung presence

Mid-Value	Wild dung	SE	Freq.
0.15	10.52	0.79	6
0.25	11.68	0.71	7
0.375	15.46	1.08	9
0.525	19.56	2.75	12
0.65	47.86	19.30	29
0.725	33.92	14.03	20
0.825	15.22	7.21	9
0.925	11.72		7

- After due consideration to regeneration/status, the relationship between canopy class and wild ungulate dung presence should be used as a guide to prescribe the stem removal
- Peripheral habitat / corridor areas should be managed for wild ungulates at a level which is 30% lower than the optimal levels in protected areas
- In general, the relationship between mean ungulate density and canopy class intervals in a sal/tree dominated forests, with polynomial curve fitting shows that the 80% lower bound corresponds to a canopy cover of 43%

(computed for sal forests of Central India; similar relationships need to be developed for other forest types to facilitate inference)

- Thus, for sal forests of Central India, the timber harvest in the peripheral habitat/ corridor area may be permitted in a selective manner so that the canopy cover does not fall below 43% during winter months. This strategy will minimize tiger-human conflict while permitting selective extraction of timber species
- More openings will permit more light while fostering more regeneration thereby attracting wild ungulates and tigers
- The idea behind peripheral habitat / corridor management is to sustain it for gene flow, while not elevating its status to that of protected area in terms of wildlife abundance

Collection of NTFP

- NTFP collection should not be permitted in areas with maximum disturbance and unestablished regeneration status, as this would adversely affect the demography of such species.
- The regeneration status of NTFP species in the peripheral habitat / corridor area should be compared with its status in the protected area habitat.
- Collection should not be permitted in areas having endangered arboreal fauna.
- No lopping / felling should be permitted during NTFP collection.
- Collection should not disturb 'canopy bridges' in an area.
- The timings for NTFP collection should be regulated while avoiding early morning or late evening.
- The patterns of NTFP collection should be studied for prescribing ecologically permissible collection.
- The quantum of NTFP collected in an area should be regulated, considering its consumption by wild animals.
- An estimation of the availability of NTFP (fruit / tuber / leaf) should be done (example: for total fruit crop estimation, considering several categories of branches and the number of fruits per branch etc.).
- Fire should not be used to promote new flush of leaves (usually done for Tendu), as this would lead to forest fire.
- Fruit removal affects frugivory, hence fruit tree should be fostered.
- The density of NTFP species in the peripheral habitat / corridor area should be compared with their densities in the protected area habitat. In low density areas such NTFP species should not be permitted for extraction.
- A chart depicting NTFPs collected in various areas within the division over months during a year should be prepared for close monitoring.
- Different parts of a tree / plant / shrub / herb are harvested as NTFP and many of them are valuable as medicinal plants. To avoid overexploitation, it is important to prescribe site specific indicators for their ecologically sustainable management, vis-à-vis the regeneration status.

- The nursery techniques of NTFP species (especially those having medicinal value) should be fostered through the community linked to incentives for growing subspecies.
- Regulation through PES (Payment for Ecosystem Services)

Collection of NTFP

Indicators to avoid over exploitation of NTFP

NTPF part harvested	**Indicators**
Fuel wood	• Regeneration status • Intensity of girdling/cutting of young trees (number of stumps per unit area) • Change in the rate of extraction • Quantum of dead/fallen twig branches on forest floor
Leaves	• Reduction in canopy cover • Reduction in leaf litter • Regeneration status • Weed invasion • Change in species composition
Fruit/flower/seed	• Regeneration status • Annual productivity per sample tree vis-à-vis the productivity in protected area habitat • Method of harvesting Season of harvesting vis-à-vis requirements of wild animals (fruit/flower/seeds act as 'qualifiers' in a habitat, and their total harvesting would reduce such welfare factors)
Bark	• Girdling • Tree mortality • Regeneration status • Number of dead stems per unit area
Rhizome	• Regeneration status

Fuel / fodder collection

a. Grazing should be regulated in a rotational manner, and prophylactic immunization should be done for village livestock.
b. Since the unrecorded removal from forest exceeds the recorded removal in many States, fuel / fodder collection should not be permitted in disturbed areas or compartments with poor regeneration status. Such areas should be

prescribed a 'recovery' period before reopening them for fuel / fodder collection.

c. A 'safe lopping index', based on site specific studies should be prescribed for fodder removal on a rotational basis.

2. Wildlife management

- Peripheral habitat /corridor areas require a 'coarse filter' approach for maintaining a variety of plant/animal species
- Day to day monitoring
- Habitat amelioration (compensatory nature)
- Fostering indigenous fodder / fruit species
- Maintaining existing water points
- No drastic habitat interventions
- Cropping pattern / harvesting to factor in cover values
- Inherent / induced diversity indices need to be computed for maintaining the edges (without enhancing them)
- Human-wildlife interface issues to be addressed
- Treatment for riparian zones / unique features
- Retention of dead trees, snags
- Restoration / protection of existing corridors

3. Eco development / PES / Sustainable livelihood / District level local development

- Village level micro planning for benefits to local people on a quid-pro-quo basis (involving VFC/EDC)
- Innovative use of JFM / REDD+/ PES / recycling of tourism gate receipts to Eco development Committees
- Benefits from district level developmental works (convergence), *interalia*, covering

i. public health and family welfare
ii. food and nutrition security
iii. education
iv. natural resource management and water security
v. sanitation
vi. roads
vii. energy
viii. housing, and
ix. livelihoods

4. Mitigation strategy for mining

- Mitigation strategy for mining should have two components:

i. improved / green technology and minimum ancillary development causing minimum habitat loss

ii. site specific mitigation measures for tiger and other wild animals, inputs for providing ecologically sustainable livelihood options to locals, besides offsite 'offsets' to achieve more tiger conservation
    - Mitigation measures for exploratory phase
    - Mitigation measures for construction / mining phases
    - Site specific mitigation measures for tiger / wild animals, while providing sustainable livelihood options (this should include onsite modification of the mined area to its original form and restoration of topsoil with indigenous ground cover or through creation of water body /wetland)
    - Offsite compensatory inputs in similar habitats within P2 or P1 areas to strengthen tiger conservation
    - Providing livelihood options to local people within the zone of influence

5. Mitigation strategy for dams and hydro power sectors

- The impacts include:

    i. First order impacts (barrier effects, effects on water quality, water quantity, flow regime and sediment load)
    ii. Second order impacts (impact on terrestrial environment affecting primary production-planktons, aquatic flora), morphology (channel form, substrate composition)
    iii. Third order impacts (impact on terrestrial environment affecting invertebrates, fish, birds and mammals)

- Mitigation measures are required to address impacts due to dams construction as well as its operation
- The mitigation plan should include onsite as well as offsite initiatives based on best global practices
- Retention of dead trees in submergence areas as 'snags' for water birds and aquatic fauna
- Prohibiting the reduction of river flow to 'zero' or 'critical' levels which would have a deleterious affect on local flora and fauna especially aquatic species permitting migration across dams through mitigation e.g., fish ladder etc.
- Mimicking the water release to the natural flooding regime
- Ensuring control of aquatic weeds and disease factors
- Safeguarding downriver flood protection
- Safeguarding against water pollution
- Appropriate fish management measures to benefit local communities through the tiger reserve management
- Site specific watershed management to safeguard against sedimentation
- Prescribing timings for use of access roads, and regulation on the maintenance infrastructure and retaining it to the minimum

- Prohibiting new, associated developmental projects in the protected area habitat
- Contributing resource support to the protected area habitat management as a 'compensatory' measure for loss of natural habitat
- Evolving and implementing a SOP, in collaboration with the tiger reserve management for rescuing wild animals from drowning
- Annual monitoring of the spatial use pattern of wild animals in the area, which should also include monitoring the development of related infrastructure
- Periodic monitoring of water quality and river ecosystem recovery
- Fostering re-vegetation of the construction site with indigenous species

6. Mitigation strategy for linear infrastructure and other projects (roads/highways/railway lines/power transmission lines/irrigation canals/open mills/wind mills)

- Roads/highways: creation of overpasses / underpasses, speed regulation, closure to traffic
- Railway lines: SOP for information exchange through wireless, speed regulation, barricades, underpasses
- Power transmission lines: insulation, surveillance, MOU with electricity boards, special patrolling, underground cabling, adequate height
- Irrigation canals: covering, crossing for animals movement
- Open wells: covering, closure of abandoned wells
- Wind mills: both offsite and onsite measures are required to prevent turbine collisions with avifauna.

7. Tourism

Strict adherence to Government of India guidelines

13.2.4 Protected area landscape master plan

The levels of integration envisaged in the context are:

- Spatial Integration
- Sectoral Integration
- Cross-sectoral integration
- Vertical Integration
- Resource Integration
- Integration with State Plans
- Integration with ongoing CSS
- Integration with local resources
- Rural/Urban integration

Figure 13.6: Conceptual chart: integration with district planning

Action portfolio (suggestive)

S. No.	Activity	Implementing Agency/ Department	Funding Agency
1.	**Prioritized Livelihood Options** Implementing rural employment guarantee scheme **Priority actions** -Promotion of Traditional agricultural varieties/Cardamom cultivation - Nettle yarn making/ handloom - Dairy Sector - Apiary/Bee keeping - Rural Tourism - Reviving Traditional handicraft as allied sector of tourism	Gram Panchayat	District level funds involving: •Rural Development • Agriculture • Handloom • Horticulture • Tourism
2	**Climate Resilient/Smart Practices** • Promotion of rainwater harvesting • Promotion of solar energy and pumps • Promotion of traditional irrigation systems • Professional team for organic farming, energy audit, waste management • Carbon neutral campaign team (volunteer group) • Energy Conservation Measures (promoting LED bulbs, solar energy/alternate energy sources) • Energy efficient thermos-boxes for households • Solar driers • Biogas plants • Promoting energy parks (electricity production from renewable energy and feeding to the power grid) for offsetting grid-based electricity consumption • Zero waste strategy • Afforestation (tree banking, adoption of existing trees, annuity on new saplings, avenue planting • agro-forestry •agro-ecology (co-creation and knowledge sharing for optimizing interactions between plants, animals, human and environment) • Human and Social values: food traditions	Gram Panchayat (assisted by a domain expert on contractual basis)	District level funds involving: • Water and Irrigation •Energy department/State Electricity Board •Department of Renewable/Non-Conventional Energy •Forest Department •Environment Department •Transport Department

	• Creating climate emergency response unit (for managing natural calamities, outbreaks etc.)		
3	Eco-Development through People participation (Actions for Community/Individual gains: income generation, resource substitution, and community cooperation)	Gram Panchayat Forest Department	Forest department District level funds involving: • Rural Development • Agriculture • MSME department
4	Safeguarding undulating areas from erosion/landslides	Gram Panchayat and Forest Department	• Forest department District level funds involving: Tourism department
5	Strategy to reduce illicit removal of timber, fuelwood and NTFP	Forest Department and Gram Panchayat	Forest department District level funds involving: • Rural Development
6	Ecotourism	Forest Department Tourism Department	Forest department District level funds involving: • Tourism department
7	Human Wildlife Conflict Management (Preventive and Control measures using state of the art technology and Rapid Response Teams)	Forest Department Gram Panchayat Police	Forest Department District level funds involving: • Agriculture • Rural Development •Public Works Department •Disaster Management • Police
8	Wildlife/Biodiversity Monitoring/ Protection/ Payment for Ecosystem Services (community spearhead teams for patrolling, monitoring livestock/crop depredation, maintaining community wildlife registers, and transmitting information to control room for forecast/alerts, reporting poaching/trafficking of wildlife body parts)	Forest Department Gram Panchayat Army BRO Police	Forest Department Defence District level funds involving: • Rural Development •Disaster management • Police
9	• Feral cattle management • Feral Dog Management (periodic sterilization/immunization, ongoing monitoring to prevent conditioning for carrion/poultry/wildlife killing or feeding)	Forest Department Gram Panchayat Veterinary and Animal Husbandry	Forest Department District level funds involving: •Veterinary Department

10	Agro forestry • Energy plantation • Fodder plantation • Bund plantation for small timber/pulp •Shade plantation (cash crops) • Avenue plantation with indigenous species	Forest Department Gram Panchayat	Forest Department District level funds involving: •Environment Department •Agriculture • Horticulture
11	Organic Farming and Certification (Organic manure, bacterial/fungal bio fertilizers, weed management, insect pest management, disease management, promoting local indigenous crops, wildlife friendly certification for branding)	Gram Panchayat Agriculture	District level funds involving: •Agriculture • Environment
12	Community Fodder Bank (Herbage production, herbage protection from fire, ants, integrating crop and livestock production with fodder banks)	Forest Department Gram Panchayat Agriculture	District level funds involving: •Agriculture • Veterinary • Forest
13	Soil and Water Conservation, including spring sheds – Structural (impoundment/anicut), Vegetative/Biological measures, Agronomic (Conservation Tillage, Contour Farming Strip Cropping, Windbreaks, Crop Rotation, Cover Crops, Buffer Strips, Grassed Waterways), Managerial measures (rainwater harvesting, revival of water ponds/bodies, use of treated wastewater), singly or in combination), developing village water security plan in identified spring sheds	Gram Panchayat Agriculture	District level funds involving: • Agriculture • Rural Development • Water Resources
14	Waste Management, including solid waste (D2D collection, source segregation, Active transport, treatment, disposal, recycling, monitoring, use of technology)	Forest Department Gram Panchayat	District level funds involving: •Ministry of Drinking Water and Sanitation – SBM mission •Tourism dept.
15	Establishment of Wetland Management Committee and Constitution of 'wetland mitra' to promote community engagement in wetland conservation, species monitoring and management	Forest Department Gram Panchayat	Forest Department District level funds involving: • Rural Development • Water Resources • Environment
16	Training of Frontline Staff (All line departments)	Forest Department Revenue department Agriculture Public Works Department	District level funds involving:

		Police Rural Development Health Department Water and Sanitation Army and BRO	Concerned departments
17	Integrated disaster risk management using an ecosystem approach - Using economic vulnerability, identifying vulnerable ecosystems and their restoration - Fostering natural defenses - Creating community emergency rescue teams - Putting in place state of the art early warning systems - Preparedness through local capacity building, post disaster clean-up operation) - Mitigation strategies for strengthening natural/artificial defenses	Disaster Management Authority District level authorities (involving several line departments) Forest Department	Forest department District level funds involving: (All line departments)

Role of line departments

S. No	Name of the Department	Mandate	Nodal Department (District level)	Nodal Department (State level)
1	Forest	Preventive and control measures in forest/Protected Areas, rural-forest interface, urban-forest interface, linear infrastructure traversing forested areas/Protected Areas and overall conflict management, wetland and river/gullies management	Forest	Forest
2	District Magistrate	Law and order, implementation of masterplan interventions in non-forest areas (preventive and control)	District collectorate	Forest and Environment
3	Police	Law and order, crowd management	Police (through District Magistrate)	Home
4	Agriculture	Cropland management (fine tuning sowing/ harvesting, including choice of species, innovative mechanisation as warranted), soil conservation measures to prevent gully erosion (avoiding wildlife shelters)	Agriculture (through District Collectorate)	Agriculture

5	Rural Development	Making available livelihood options (wage oriented)	Rural Development (through District Collectorate)	Rural Development
6	Road and Transport/ Public Works Department	Preventive interventions along civil structures/ culverts/highways apart from road hit safeguards	PWD (through District Collectorate)	PWD
7	National Highways Authority of India	Preventive interventions along civil structures/ culverts/highways apart from road hit safeguards	NHAI (in coordination with State Govt. through Govt. of India)	National Highways Authority of India
8	Railway	Preventive interventions along civil structures/ culverts/highways apart from road hit safeguards	Railway (in coordination with State Govt. through Govt. of India)	Railway
9	Irrigation	Water level regulation to prevent flooding of wildlife movement pathways, construction of crocodile filters/weirs	Irrigation	Irrigation
10	Environment	Interventions for safeguarding green space, management of urban fauna/flora, invasive weed management in urban/rural landscapes to prevent wildlife cover	Environment (through District Collectorate)	Environment
11	Municipal Body	Garbage disposal (solid as well as drainage), monitoring carrion feeding to prevent wildlife adaptation	Municipal Body/ local Panchayat (through District Collectorate)	Municipal Body
12	Veterinary	Human wildlife conflict management: rescue operations of wild animals in distress or those causing distress	Veterinary (through District Collectorate)	Veterinary
13	Panchayat	Community stewardship for preventive and control actions as per masterplan in rural landscape	Panchayat (through District Collectorate)	Panchayat
14	Urban Development	Urban/rural cover management to avoid wildlife shelter/cover along green spaces, community stewardship along forest interface borders to facilitate preventive and control actions	Urban (through District Collectorate)	Urban
15	Tourism	Garbage disposal and monitoring of food waste accumulation near tourist destinations	Tourism (through District Collectorate)	Tourism

16	Pollution Control Board	River/channel/wetland cleaning to prevent carrion feeding by wild animals	State Pollution Control Board (through District Collectorate)	State Pollution Control Board in coordination with Central Pollution Control Board
17	Commerce and Industries	Business models for community stewardship (livelihood gain to locals), creating market linkage for local produce	Commerce and Industries Business groups (through District Magistrate)	Commerce and Industries
18	Paramilitary	Transboundary monitoring/surveillance of wild animals' movement	Ministry of Home Affairs, Govt. of India in coordination with State/District agencies	Ministry of Home Affairs
19	Border Road Organization	Transboundary monitoring/surveillance of wild animals' movement, safeguarding blockage of traditional wild animal pathways to prevent altered movement towards human settlements	Ministry of Home Affairs, Govt. of India in coordination with State/District agencies	Ministry of Home Affairs
20	Naval Cost Guard	Transboundary/National • Monitoring /surveillance of Wildlife • Safeguarding against trafficking (body parts, derivatives, live specimens) • Safeguarding against blockage to sea routes of wild animals • Safety and protection of artificial islands and offshore terminals • Assistance and protection of fishermen in distress at sea	Ministry of Defence, Govt. of India	Ministry of Defence, Govt. of India
21	State Electricity Board	Insulating high tension cables near human settlements to avoid targeted killings of wild animals	State Electricity Board (in coordination with District Magistrate)	State Electricity Board
22	Disaster Management Authority	Funding of preventive and control measures as per HWC masterplan	Budget provision (through District Collectorate)	Disaster Management Authority

Ongoing schemes (State specific)

S. No	Name of the Scheme	Implementing ministry/ organization/ department	Details of the scheme
1			

Multi-dimensional Wildlife Index (MWLI): for Wildlife

Apart from performance indicators, the overall health of a protected area landscape requires monitoring with a dual approach – viz. "ecological" and "social".

The conceptual framework provided below is drawn from the UNEP-WGMG and Luc Hoffmann Institute Scoreboard (2020).

Multi-dimensional Biodiversity Index (MBI)

Several frameworks are available for firming up a Multi-dimensional Biodiversity Index (MBI) to assess mainstreaming of biodiversity concerns in sectors, where biodiversity may or may not be the primary goal warranting several dimensions. The overarching approach is "dual" to encompass both ecological and social perspective.

In the context of ecology, this pertains to the overall status of biodiversity, *viz.* connectivity, intactness, resilience, apart from ongoing evolutionary processes. The attributes considered for assessment include *richness, abundance, phylogenetic distance of species and ecosystem.*

The biodiversity health in a social perspective is construed as the need to ensure benefits/gains, largely relating to economy and livelihood. This also underlines the positive linkage between biodiversity and a good quality of life resulting in human well-being based on sustainable development. The attributes for assessment usually include *agrobiodiversity, sustainable agriculture, use of traditional knowledge, livelihood options and health/quality of life*.

Multi-dimensional Wildlife Index (MWI): for Wildlife

Indicators in the above context are provided below:

Biodiversity of Nature

S No.	Assessment Criteria		Method/Scalability	Land Use/Sector	Relevance for CBD targets Kunming Montreal and indicators	Temporal sensitivity
	Variable class	**Variable example**				
1	**Species populations**	Abundance and distribution	• Counts • Presence/Absence survey (for species monitoring across sites complemented with opportunistic data)	• Forest Department • Gram Panchayat • Agriculture • Commercial estate/plantations	Targets: 4,5,6,7,8,9,10, 11,12,14,15 Indicators: IPI, WPI, RLI Population and Extinction risk trends of target species (ex: Tiger, Fishing Cat, Rhinoceros) Forest specialists in forest under restoration Species that provide ecosystem services Trends in invasive alien species Trends in climatic impact on populations	Annual
2	**Community Composition**	Taxonomic diversity	• Multi-taxa surveys	• Forest Department • Gram Panchayat • Agriculture • Commercial estate/plantations	Targets: 8,10, 14 Indicators: Trends in condition and vulnerability of ecosystems Trends in climatic impacts on community composition	Annual
3	**Species traits**	Phenology	• Timing of leaf coloration by remote sensing	• Remote Sensing cell	Targets: 10, 15 Indicators:	Annual

			with ground truthing	• District monitoring cell	Trends in extent and rate of shifting of boundaries of vulnerable ecosystems	
4	**Ecosystem structure**	Habitat Structure	• Remote sensing of cover (or biomass) by height or depth	• Remote Sensing cell • District monitoring cell	Targets: 5,11,14,15 Indicators: Extent of forest and forest types Extent of habitats that provide carbon sequestration	Annual

Wildlife for People

S No.	**Assessment Criteria**		**Method/Scalability**	**Land Use/ Sector**	**Relevance for CBD targets (Aichi) and indicators**	**Temporal sensitivity**
	Variable for people	**Variable example**				
1	**Materials and Assistance**	Sustainable agriculture	• Survey and Mapping	• Agriculture • Gram Panchayat	Targets: 7,13 Indicators: Areas of agricultural land under organic production Areas of agricultural land under conservation agriculture Proportion of agricultural area under productive and sustainable agriculture	Annual
		Agro biodiversity	• Survey and Mapping	• Agriculture • Gram Panchayat • Forest • Commercial plantatio	Targets: 7,13, 19 Indicators: Areas of agricultural land under conservation agriculture Wild Bird Index for farmland birds / Living Planet Index (farmland specialists)	Annual

				ns/estates		
		Traditional knowledge	• Survey	• Agriculture • Gram Panchayat • Tribal welfare • Forest	Targets: 16,18,19 Indicators: Number of local community-based monitoring on traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity	Three years cycle
		Livelihood options	• Survey	• Rural development • Gram Panchayat • Agriculture • Forest • Commercial plantations/estates	Targets: 18,19, Indicators: Trends in the degree to which ecosystem services provides for the needs of women, indigenous and local communities, and the poor and vulnerable Trends in the practice of traditional occupations	Annual
2	**Non-material**	Health and life quality • Disease occurrence (landscape disturbance related) • Prophylactic safeguards	• Panchayat level Health survey • Door to door	• Rural development • Health • Gram Panchayat • Commercial operations/estates	Targets: 8, 14 Trends in the degree to which ecosystem services provides for the needs of women, indigenous and local communities, and the poor and vulnerable	Annual

		• Waste management	Survey	• Solid waste management agency		
3	**Regulation and Mitigation**	• Climate smart practices	• Carbon arithmetic assessment • Ecological footprint assessment • Adaptation/Mitigation assessment	• Gram Panchayat • Agriculture • Commercial entities • Surface Transport • Electricity • Housing	Targets: 14,15 Trends in carbon stocks within ecosystems	Two years cycle
		• Safe water	• Water quality measurement • Watershed quality mapping • Watershed restoration mapping	• Gram Panchayat Pollution Control Board • Irrigation department • Water supply	Targets: 8,14 Percentage of population using safely managed drinking water services	Annual
		• Natural disaster protection	• Disaster vulnerability safeguard assessment	• Gram Panchayat	Targets: 15 Trends in ecosystem resilience	Annual

13.2.5 Wetland

The Ministry of Environment, Forest and Climate Change has notified the "Wetlands (Conservation and Management) Rules, 2017", under the provisions of the Environment (Protection) Act, 1986 as a regulatory framework for conservation and management of wetlands in India, along with related Rules.

India is a signatory to the Ramsar Convention on wetlands for conserving their biodiversity and wise use and extending their scope to a wide variety of habitats, including rivers, lakes and numerous man-made wetlands. Government of India has identified a number of wetlands under its conservation programme and provides financial and technical assistance to the State Governments for various conservation activities through approved Management Action Plans. The National Environment Policy, 2006 (NEP-2006) recognises the numerous ecological services provided by wetlands and emphasizes development a national inventory of such wetlands and the need for setting up a legally enforceable regulatory mechanism for the identified wetlands.

13.2.6 Community/Conservation reserve

Conservation reserves are constituted on government lands adjacent to national park/sanctuary, specially those linking one protected area to another. Section 36 A of the Wild Life (Protection) Act, 1972 is the enabling provision in the context. Under Section 36 B of the said Act "a conservation reserve management needs to be constituted for advising the Chief Wild Life Warden for conservation, management and maintenance of the reserve.

A community reserve, constituted under Section 36 C of the said Act is notified on a private land owned and willingly provided by an individual or community for conserving wildlife and its habitat or local cultural traditions. As in the case of Conservation Reserve, a community reserve management committee is required for conserving and managing community reserve.

Thus, a conservation reserve has a "corridor significance", whereas the community reserve focuses on in-situ conservation of flora/fauna or cultural traditions. Owing to the presence/proximity of human settlements, both warrant and "inclusive" co-occurrence strategy involving local people and other stakeholders. The centrality of gainful "community stewardship" is important in the management of both reserves to ensure sustainability.

13.2.7 Corridor

"Corridor" in wildlife parlance cannot to "linkages" facilitating wildlife movement. Such linkages could be vegetal (natural forest or man-made plantations/cultivation sites) or non-vegetal (natural, riverbed, ravines or human made structures like causeway or roads). Thus, there are many "types" of linkages which function as corridors in the context of a wildlife source area.

The corridor management is largely a co-occurrence portfolio owing to the proximity of human settlements. It warrants protection, but not enrichment through active interventions to boost wildlife abundance. The human-wildlife interface and right burdening of forests with increased natural resource dependency of local people calls for:

- Identification and mapping of potential corridors (circuit scaping, least cost pathways, and other GIS based connectivity models/expert knowledge)
- Regular monitoring at village level
- Preventive and control measures to address human-wildlife interface
- Safeguarding from intensive land uses and disturbances
- Ensuring retrofittings and smart green infrastructure

The near presence of a corridor does not indicate its functionality. The latter necessitates due safeguards from various sectors and stakeholders, which constitute the corridor management.

14. DETERMINING CRITICAL WILDLIFE HABITAT

The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act (FRA), 2006 defines a "Critical Wildlife Habitat" (CWH) and the process for establishing the same within the protected areas. Excerpts from the said Act are reproduced below:

"Critical wildlife habitat" means such areas of National Parks and Sanctuaries where it has been specifically and clearly established, case by case, on the basis of scientific and objective criteria, that such areas are required to be kept as inviolate for the purposes of wildlife conservation as may be determined and notified by the Central Government in the Ministry of Environment and Forests after open process of consultation by an Expert Committee, which includes experts from the locality appointed by that Government wherein a representative of the Ministry of Tribal Affairs shall also be included, in determining such areas according to the procedural requirements arising from sub-sections (1) and (2) of section 4;

(1) Notwithstanding anything contained in any other law for the time being in force, and subject to the provisions of this Act, the Central Government hereby recognises and vests forest rights in – (a) the forest dwelling Scheduled Tribes in States or areas in States where they are declared as Scheduled Tribes in respect of all forest rights mentioned in section 3; (b) the other traditional forest dwellers in respect of all forest rights mentioned in section 3.

(2) The forest rights recognised under this Act in critical wildlife habitats of National Parks and Sanctuaries may subsequently be modified or resettled, provided that no forest rights holders shall be resettled or have their rights in any manner affected for the purposes of creating inviolate areas for wildlife conservation except in case all the following conditions are satisfied…

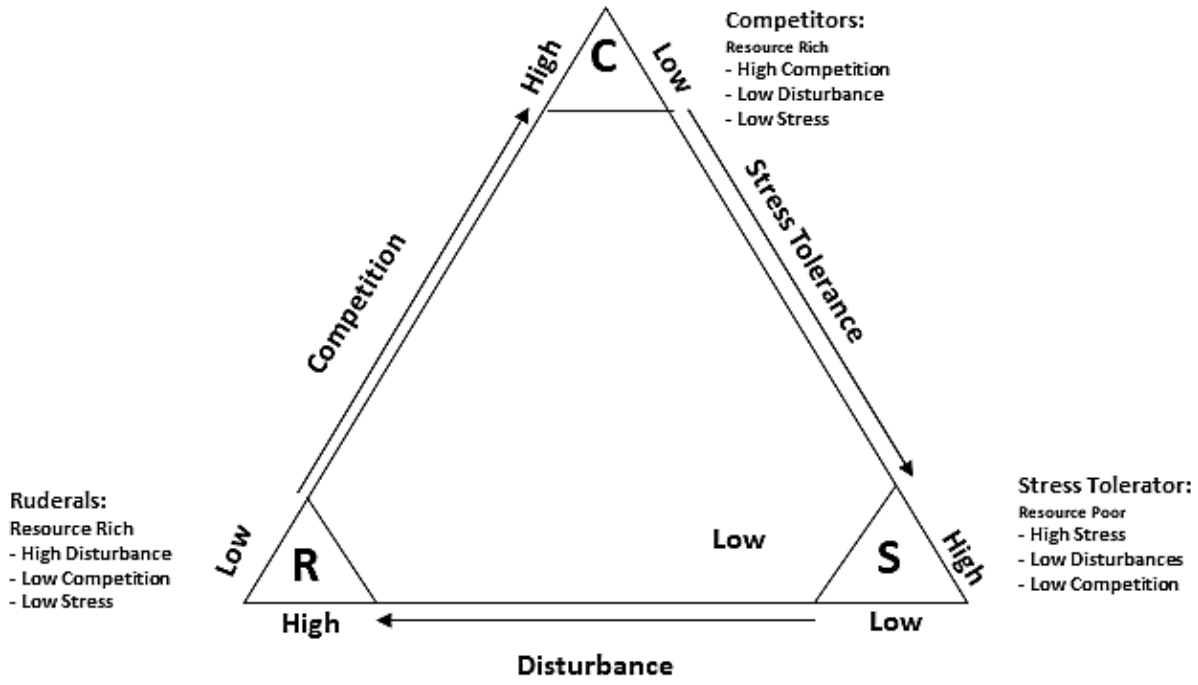
The Ministry of Environment, Forest and Climate Change (Wildlife Division) has issued guidelines for notification of CWH vides its circular No.1-23/2014-WL dated 04 January 2018. The following criteria are suggested in the context:

- Appraisal of resource availability/selection by major wild herbivores in the protected area along anthropogenic stress gradient
- Appraisal avian species richness and preparation of species inventory
- Identifying the spread of catchment area, if any, within the protected area

After according due weight age to the findings from the above, an additive index needs to be evolved for deciding the CWH area.

1. Appraisal of resource availability/selection by major wild herbivores in the protected area along anthropogenic stress gradient

(a) It is important to make an appraisal of the extant anthropogenic stress gradient vis-à-vis the tiger reserve, and its impact on resource selection by wild herbivores of the reserve.



Grime's triangle

An agro ecological perspective of the surrounding landscape becomes important for prescribing action towards sustainability while ensuring gains to local people. An analogy is required with the Grimes' plant life history strategies and the response of ecosystems to anthropogenic disturbance. By and large, it is seen the gradient from a protected area to peripheral areas is characterized by loss of resource, viz. from resource rich area dominated by competing indigenous species to resource poor areas dominated by stress tolerant species and weeds in a scenario of overuse.

(b) Data collection and suggested analysis towards:

- Comparison of habitat selection by major herbivore/omnivore species including livestock of protected area, along anthropogenic stress gradient, during:
    a. Pinch period
    b. Other season
- Factors influencing animal distribution

(c) Field work vis-à-vis above along stress gradient

- Selection of representative study areas in the protected area
- Estimating densities of major herbivore species using trail based distance sampling
- Mapping habitat and terrain
- Mapping ungulate distribution
- Collecting herbivore crop damage data which will surrogate crop choice and seasonality effect
- Collecting carnivore conflict data
- Mapping elephant distribution, crop damage if any – along with corridor usage
- Recording habitats of arboreal animals

(d) Suggested tools/analysis

- Population size: use of line transacts and distance sampling
- Characterization of habitat types: cluster analysis
- Macro level habitat use (pellet deposition)
- Multi-dimensional analysis (DCA or NMDS) using sighting and dung data

(e) Required insights in the context

- Understanding habitat occupancy along stress gradient in terms of space and food by major herbivores
- Which is the most abundant herbivore?
- Differences in relative occupancy of such habitat types by different herbivores
- Predictive model by logistic regression to explain habitat occupancy in terms of different features of the habitat viz. tree density, shrub density, distance to water, livestock presence and others
- The context of Human-Wildlife Conflict (HWC)

2. Using principles of island biogeography and related aspects to determine Critical Wildlife Habitat

Most protected areas exist as “islands” in the vast sea of ecologically unsustainable landuses dominated by humans and cattle. Their shape, size and proximity to other similar areas vary. It is important to draw an analogy with the island biogeography theory; viz. *successively larger reserve*

contains all the species of smaller reserves plus additional species which have more stringent minimum area requirements. There is a predictable gradient among species with some warranting special habitat requirements.

Based on the above, the following method may be adopted to determine Critical Wildlife Habitat along the anthropogenic stress gradient:

- Divide the protected area into unequal (area) size aggregates of beats or similar sections
- Each unequal section may be considered as a patch and the number of species found in the same be counted to obtain the accumulated number of species
- The process needs to be continued till the maximum number of accumulated species is obtained (plotting species area curve)
- The area at asymptote is the Critical Wildlife Habitat (accumulated)

3. Identifying the spread of catchment area, if any, within the protected area

- Spatial Analysis for potential water catchment areas within the protected area

14.1 MoEF&CC guidelines for determination and notification of Critical Wildlife Habitats within National Parks and Sanctuaries
(F.No.1-23/2014-WL dated 04 January 2017)

Preamble:

The purpose of these Guidelines is to detail the procedure for determining and notifying inviolate areas within National Parks and Wildlife Sanctuaries for wildlife conservation known as Critical Wildlife Habitats as required by the Scheduled Tribes and Other Forest Dwellers (Recognition of Forest Rights) Act, 2006. These conform to the mandatory requirement of the Scheduled Tribes and other Traditional Forests Dwellers (Recognition of Forest Rights) Act, 2006.

1. Background:

1.1 As per the Section 2(b) of FRA, 2006, the Ministry of Environment and Forests (MoEF) has been identified as the agency to determine and notify Critical Wildlife Habitats (hereinafter referred to as CWH). The Ministry of Tribal Affairs (MoTA) is the nodal ministry for recognition and vesting of individual and community forest rights. Therefore, these guidelines have been framed to determine and notify CWH within National Parks and Wildlife Sanctuaries, to harmonize the provisions of the FRA, 2006 and the Wild Life (Protection) Act, 1972, and to address concerns of conservation of wildlife and its habitat, while safeguarding the forest rights of the Scheduled Tribes and other Traditional Forest Dwellers.

2. Objective:

2.1 The purpose of this guideline is to give effect to the provisions of the FRA, 2006, which envisage the creation of inviolate spaces (CWH) within National Parks and Wildlife Sanctuaries, so as to ensure the conservation of, and the prevention of damage to, wildlife and its habitat within the determined area.

2.2 The Wild Life (Protection) Act, 1972 provides for the conservation and management of National Parks and Wildlife Sanctuaries. The FRA, 2006, applies to National Parks and Sanctuaries, where forest rights are being recognized and vested in Scheduled Tribes and Other Traditional Forest Dwellers in such areas. These rights can only be modified or resettled as per the provisions of the FRA, 2006.

2.3 These objectives are to be achieved following a process, which is simple, implementable, acceptable, and can be completed within a reasonable time frame.

3. Relevant provisions of the FRA, 2006 for determination of the Critical Wildlife Habitat:

3.1 The relevant provisions in the FRA, 2006 relating to the determination of CWH and allied issues, in National Parks and Wildlife Sanctuaries, are contained in Section 2(b) and 4 (1) & (2).

3.2 Section 2(b) of the Act defines Critical Wildlife Habitats as follows: *" 'Critical Wildlife Habitat' means such areas of National Parks and Sanctuaries where it has been specifically and clearly established, case by case, on the basis of scientific and objective criteria, that such areas are required to be kept as inviolate for the purpose of wildlife conservation as my be determined*

and notified by the Central Government in the Ministry of Environment, Forest and Climate Change after an open process of consultation by an Expert Committee, which includes experts from the locality appointed by that Government wherein a representative of the Ministry of Tribal Affairs shall also be included, in determining such areas according to the procedural requirements arising from sub-section (1) and (2) of Section 4.".

3.3 Section 4(1) of the FRA, 2006 recognizes and vests forest rights in Scheduled Tribes and other traditional forest dwellers. The Forest Rights are listed in Section 3 of the FRA, 2006, which, inter-alia, secure individual or community tenure or both.

3.4 Section 4(2) of the ACT provides that the forest rights provided under Section 3 of the FRA, 2006 can be subsequently be modified or resettled outside the Critical Wildlife Habitats. However, no forest rights of Scheduled Tribes and other traditional forest dwellers can be modified or resettled from any Critical Wildlife Habitats unless all the provisions of Section 4(2)(a) to (f) of the FRA, 2006 are complied with, namely:

a) The process of recognition and vesting of rights is completed as per Section 6;

b) It has been established by the State Government that the presence or the activities of the holders of forest rights will cause irreversible damage and threaten the existence of said species and their habitat;

c) The State Government has concluded that other reasonable options such as co-existence are not available;

d) A resettlement or alternatives package has been prepared and communicated which provides a secure livelihood to the affected individuals and communities;

e) The free informed consent of Gram Sabha has been obtained in writing to the proposed resettlement and the package;

f) Facilities and land allocation at the resettlement location are complete as per the promised package.

3.5 Notwithstanding the provisions of the Wild Life (Protection) Act, 1972, the FRA, 2006 provides that the procedure of admitting claims, and recognizing and vesting forest rights within National Parks and Wildlife Sanctuaries has to be undertaken by the Gram Sabha, the Sub-Divisional Level committee and finally the District Level Committee under Section 6 of the FRA, 2006.

3.6 The procedure prescribed for determination of Critical Wildlife Habitats by this Guideline has been formulated with the above legal framework in mind.

4. Definitions:

4.1 In these Guideline, unless the context otherwise requires-

(a) "Act" means the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 (2 of 2007);

(b) "Protected Area" means a National Park or a Sanctuary as notified under the relevant provisions of Wild Life (Protection) Act, 1972 (53 of 1972);

(c) "Expert Committee" means the Committee set up by the State/Government of Union Territory Chief Wild Life Warden as authorized by Central Government in accordance with clause (b) of Section 2 of the Act and as provided in rule 4 of these rules;

(d) Standing Committee of National Board of Wild Life means the Committee as prescribed in Section 5B of the Wild Life (Protection) Act, 1972 (53 of 1972), for advising the Central Government on wildlife related matters;

(e) State Board for Wild Life means the Board constituted in accordance with the Section 6 of Wild Life (Protection) Act, 1972 (53 of 1972) to advise the State Governments on wildlife matters.

4.2 The words and expression used herein and not defined, but defined in the Act, shall have the meanings respectively assigned to them in the Act.

5. Constitution of Expert Committee:

5.1 In exercise of the powers conferred by clause (b) of Section 2 of the Act, the State Chief Wild Life Warden of the Government, on behalf of the Central Government, shall, with the approval of the State/UT Government, notify Expert Committee(s), for the purpose of identification of Critical Wildlife Habitats in a National Park or Sanctuary and the Expert Committee shall consist the following composition: -

1.	An officer of the State Forest Department not below the rank of a Chief Conservator of Forests having jurisdiction over the National Park/Sanctuary	Chairperson
2.	Representative, Ministry of Tribal Affairs, Government of India	Member
3.	One social scientist	Member
4.	Two experts on life sciences (Ecology, Zoology, Botany, Wildlife Science etc.)	Member(s)
5.	Panchayat President/Sarpanch of each local Panchayat covering the area of the National Park/Sanctuary or a member of the Panchayat nominated by the Sarpanch	Member(s)
6.	Officer in charge of National Park/Sanctuary not below the rank of an Assistant Conservator of Forests in which area the said National Park/Sanctuary is situated	Member-Secretary

6. Identification of Critical Wildlife Habitats:

6.1 The Expert Committee shall identify areas within the National Park or Sanctuary required to be kept inviolate for the purpose of wildlife conservation and the said Committee may conduct necessary field visits and undertake identification of Critical Wildlife Habitats, based on scientific and objective criteria relevant to the National Park or Sanctuary.

6.2 The Expert Committee shall adopt an open process of consultation with, the forest rights holders, in their local precincts, to solicit their views on the proposed notification of Critical Wildlife Habitats.

6.3 The record of the proceedings of the Committee shall be maintained for submission to the Ministry of Environment, Forest and Climate Change along with the proposal for notification of Critical Wildlife Habitats.

7. Consultation by the Expert Committee:

7.1 After preliminary identification of area within National Parks or Sanctuary for notification as Critical Wildlife Habitat where resettlement or modification of forest rights is proposed based on clear scientific and objective criteria, the Chairman of the Expert Committee shall issue public notice on the intention to notify the Critical Wildlife Habitat.

7.2 The public notice shall be issued at least 15 days prior to conducting the open consultation with the stakeholders.

7.3 The public notice shall, contain least the following details:

(i) Area(s) identified within the National Park/Sanctuary with clear boundary description, to be notified as Critical Wildlife Habitat;

(ii) Scientific and Objective criteria adopted in identification of the Critical Wildlife Habitat;

(iii) Implication of the notification on the existing rights including modification or resettlement thereof, as proposed;

(iv) all options on resettlement and rehabilitation schemes if any, proposed;

(v) issues pertaining to human-wildlife conflict, if any and;

(vi) The date, time and venue of the open consultation, which shall be within the precincts of the people living in the area proposed to be notified as Critical Wildlife Habitat.

7.4 The public notice shall be circulated to all concerned offices of the Department of Tribal Affairs; Local Bodies; District Collector, Taluk officers and all the concerned Forest Offices (Chief Conservator of Forests; Conservator of Forests; Deputy Conservator of Forests/Divisional Forest Officer; Range Forest Officer; Section foresters; Beat Guard); besides adequate publicity by suitable means locally.

7.5 Arrangements for conveyance of the people living in the habitations located within the area proposed to be notified as Critical Wildlife Habitat shall be made by the Forest Office concerned.

7.6 The Expert Committee shall carry out extensive and open consultation with all the stakeholders, on the date(s) and place as specified in the public notice and the proposal shall be explained in local language in detail before seeking the views of the participants.

7.7 The proceedings of the open consultation shall be documented appropriately, including views and opinions expressed by the beneficiary communities, specifically recording objections, if any, and basis thereof, as narrated by the concerned.

8. Quorum:

The Quorum for the meetings of the Expert Committee shall be 75 percent of the Members.

9. Process of submission of proposals for notification of Critical Wildlife Habitats:

9.1 Based on the scientific determination of Critical Wildlife Habitats and open consultations with the forest rights holders, the Expert Committee shall submit a proposal for the Critical Wildlife Habitat to the Chief Wild Life Warden and the proposal shall be accompanied by a map, preferably on 1:50,000 scale and a digital map (shape file), of the National Park or Sanctuary concerned and the area finally identified and proposed as Critical Wildlife Habitats.

9.2 The proposal shall also be supported by the documentation referred in 6.3 and 7.7.

9.3 On receipt of the proposal of the Expert Committee, the Chief Wild Life Warden shall scrutinize it and arrange to place the proposal for advice of the State Board for Wild Life to the State/Union Territory Government.

9.4 The State/Union Territory Government, shall forward the proposal, along with the recommendation of the State Board for Wild Life, to the Ministry of Environment, Forest and Climate Change.

9.5 The Ministry of Environment, Forest and Climate Change shall, on receipt of the proposal along with the State Government's recommendation thereon, place it before the Standing Committee of National Board for Wild Life for its consideration.

9.6 In accordance with clause (b) of Section 2 of the Act, a nominee of the Ministry of Tribal Affairs shall be invited during deliberation of the said proposal by the Standing Committee of National Board for Wild Life.

9.7 After consideration of the recommendation of the Standing Committee of National Board for Wild Life, the notification of the Critical Wildlife Habitats shall be published in the official Gazette.

10. Clarification and General Principles:

10.1 For a Critical Wildlife Habitats to be really inviolate, it will be essential that an objective assessment of the current pressures and future demands on forest resource for a variety of uses is made. Present and future levels of human-wildlife conflict will also need to be factored in and discussed with the local communities to evaluate the long term viability of residing and earning livelihood within the area of the Critical Wildlife Habitats.

10.2 A Critical Wildlife Habitats may extend to the entire area comprising a National Park or Wildlife Sanctuary, or only a part of it, as is scientifically and objectively determined by the Expert Committee.

15. STEPS IN PREPARING A MANAGEMENT PLAN

- Create a Management Planning Cell
- Equip the Cell with a full time officer, along with Computer/Desktop/GIS facility and technical staff with domain expertise
- Obtain:
    - earlier management plans of the protected area
    - copies of relevant circulars
    - protected area specific directions/observations of the Hon'ble Courts
    - peer reviewed publications, if any
    - grey literature
    - working plans of adjoining forest divisions
    - latest district level plan(s) relating to protected area and its surrounds
    - list of special schemes of Centre/State ongoing in the landscape
    - details of industries/business groups having a stake in the area
    - details of heavily used infrastructure (road/rail)
    - details of recent disease outbreak as per veterinary record
    - special precautions, if any relating to extremist engineered disturbances and related data
    - monitoring records of protected area, day to day protocol findings, wildlife crime record, human-wildlife conflict record, ongoing litigations of wildlife crime, audit findings, radio telemetry data, if any
    - forest resource dependency of local people (month-wise)
- Deploy a technical team for field data collection, proficient in wildlife tools/techniques
- Organise training workshops for data collection, use of range finder, compass, GPS and data collection formats (capacity building of frontline staff)
- Translate the data collection forms in local language (if necessary)
- Carry out a reconnaissance, envision a futuristic strategy based on SWOT
- Organise capacity building workshops for staff and other stakeholders

- Prepare local flora for identification
- Prepare guides/photo templates for identification of wild animals
- Carry out landscape fragmentation analysis in and around the protected area, preferably up to a radial distance of 10 km from the protected area boundary using landscape indices, viz. total class area, number of patches, patch density, interspersion and juxta position index, largest patch index vis-à-vis the classified LULC map of the area from covering last two decades. Comparison of landscape indices within and outside the protected area during the time period would provide an insight on the fragmentation (this would form the basis of future strategy)
- Field data collection and supervision
- Collate empirical scientific data relating to the protected area and its species:
    - comparison of habitat selection by major herbivore/omnivore species including livestock along anthropogenic stress gradient during pinch and other seasons
    - estimating densities of major herbivores for above comparison using trail-based distance sampling
    - mapping habitat and terrain (GIS wing of the State)
    - obtaining status of protected area linkages with nearby areas
    - mapping ungulate distribution
    - mapping wild herbivore crop damage across seasons
    - mapping carnivore conflict data
    - mapping elephant distribution (if present or frequented)
    - mapping habitats of endangered arboreal animals (use expert knowledge as well)
- Suggested tools towards data analysis
    - population size: line transacts and distance sampling
    - characterisation of habitat types: cluster analysis
    - macro level habitat use: palette/dung deposition
    - multidimensional analysis (DCA-Detrended Correspondence Analysis-multivariate statistical technique/NMDS-Non-Matric Multidimensional Scaling-analysis to reduce research objects in multidimensional space to low dimensional space) using sighting and dung data
- Obtain insights on:

    - habitat occupancy of ungulates covering all seasons
    - habitat occupancy of ungulates during pinch period for drawing inference toward human-wildlife conflict
    - inherent ecological carrying capacity of the habitat for predators (use Heyward's regression)
    - spatial occupancy map of herbivores/carnivores/small cats and other prominent meso-predators from opportunistic camera trapping
- Delineate an environmental/natural stress gradient, if any across the protected area
- Delineate an anthropogenic stress gradient along the protected area akin to Grime's triangle
- Socio-economic data collection
    - household survey (sampling) for forest resource dependency, income
    - human-wildlife conflict survey
    - NTFP/forest resource dependency appraisal
    - overall settlement impact analysis
    - radar chart of ongoing welfare schemes and gaps
- Envisioning strategy based on wildlife status and peripheral Zone of Influence (10 km)
    - examine the need for zonated actions (zone plans?)
    - decide on overlapping thematic actions (protection, and the like)
    - prescribe action portfolios vis-à-vis the inherent biological carrying capacity of the habitat
    - identification of corridors and syncing their management with Zone of Influence actions
    - identification of mitigation measures in place and evaluation of their impact based on a protocol consisting of:

Mitigation measure	**Appraisal of effectiveness**
Road/Rail	• Reduction in road hits • Normal spatio-temporal use pattern by wildlife • Reduced targeted killings/poaching

Stream/river (overpass)	• Normal spatio-temporal use pattern by wildlife • Unhindered canal crossing
Powerlines	• Reduced electrocution deaths • Reduced mortality of birds in flight

- Prescribe
    - performance indicators for prescribed interventions
    - select a few wildlife species as surrogate indicators of biodiversity (multidimensional in sync with CBD targets)

16. STAGES FOR A MASTERPLAN (ZONE OF INFLUENCE SUBSUMING ESZ)

- Carryout situation analysis of biodiversity status (broad appraisal)
- Make an appraisal of landscape disturbance using remote sensing data in GIS
- Delineate broad categories of land parcels within the landscape (forest, rural, urban)
- Make an appraisal of stressors operating in all categories of land parcels (natural and man made)
- Based on situation analysis carry out a biodiversity scoring
- Layer district maps over the envisioned landscape
- List out all stakeholders (government, non-government, local people, business groups)
- Co-relate stressors with stakeholder landuse
- Explore scope for *sensu-stricto* and *sensu-lato* actions
- Prepare a composite stakeholder wise Annual Plan of Operation indicating actions/cost
- Ensure centrality of community gains (stewardship)
- Prescribe synergy with district planning and implementation to ensure
    - Spatial Integration
    - Sectoral Integration
    - Cross-sectoral integration
    - Vertical Integration

    - Resource Integration
    - Integration with State Plans
    - Integration with ongoing CSS
    - Integration with local resources
    - Rural/Urban integration
- Prescribe monitoring and evaluation and indicators (performance and multidimensional)
- Prescribe an administrative mechanism for periodic monitoring and course correction

PART – C

GUIDANCE TEMPLATE FOR THE PREPARATION OF A WILDLIFE MANAGEMENT PLAN

C-I FOR NATIONAL PARK/WILDLIFE SANCTUARIES

Cover Page – TITLE and DURATION OF PLAN – 10 years

INDEX

PREFACE

Add LIST of MAPS

Add LIST OF TABLES EXECUTIVE

SUMMARY

The LEGAL AND REGULATORY COMPLIANCE – may mention Policies (National Forest Policy, 1988; State Forest Policy…; National Environment Policy, 2006); Acts; Rules; Manuals; Guidelines; Treaty; Advisories; SOPs. FOUNDATION DOCUMENTS. This part may have names of reference documents like previous Working Plan/s (if any); previous Management Plan/s; Notification/s – if Forest area, notification under Indian Forest Act, 1927 or any other; notification of PA under Wildlife Protection Act or any other, relevant document/s of Planning Department of the State; Environment Protection Act, 1986; Guidelines issued by the MoEFCC, among others

Part A

Protected Area

Chapter 1 Introduction

1.1 Background (of the state)

The section will include information on biodiversity, unique features, topography, and Culture-Nature Linkages in the state. It will present the geo-political boundaries, landscape attributes, and ecosystem features.

1.2 Protected Area (PA) Network of the State

This information will provide a holistic broad view of the protected area network viz. National Parks, Wildlife Sanctuaries, Conservation Reserves, and Community Reserves

within the respective states and the management status, in a tabular format with the year of notification and total area in the **ANNEX- I** in the following tabular format.

S.No.	Name of the Protected Area/ Tiger reserve	Category of Protected Area (Sanctuary/ National Park/ Conservation Reserve/ Community Reserve) or Tiger Reserve	Whether initial or final	Year of notification	Stage of settlement of rights from Section 19-25 of the Wild Life (Protection) Act, 1972 in case of initial notification	Period of previous approved management plan
1.						
2.						

1.3 Major biodiversity conservation initiatives and milestones in the state

Major initiatives that have been/are being undertaken by the state for biodiversity conservation either through centrally sponsored schemes, state-sponsored schemes, or supplementary funding on habitat and species conservation will be covered. Significant research and outreach activities that have contributed to community engagement will also be covered as section **ANNEX II** in the following tabular format.

S.No.	Name of the Scheme	Whether Centrally Sponsored Scheme/ Externally Aided Project/ CAMPA/ State Plan/ Other sources	Year of implementation	Major initiatives (e.g. ex-situ conservation breeding programme, species specific conservation initiatives etc., population estimation exercises, research initiatives etc.)
1.				
2.				

Chapter 2 Introduction to the PA and Background Information

2.1 Name and Constitution/Notification

Brief introduction about the protected area shall be given in narrative form which shall include the name of the protected area as per the notification, year of notification, G.O. number, and area as notified and the act in which the protected area was notified. The notification of the PA shall be placed as **ANNEX III** in the following tabular format.

2.2 Location, Physical Boundaries, and Extent

This section shall mention the location of the PA with respect to state, district, division physical boundary, and extent of the protected area will be added. The map of the PA as provided with the notification and as prepared by which DGPS or Total Station Survey shall be **ANNEX IV** and **ANNEX V**.

2.3 Zone of Influence

The zone of influence (ZOI) will delineate an envisioned landscape (spread across peripheral land uses, subsuming the ESZ, and with a scale/radial distance of atleast twice the home range of the target species – large mammals like the big cats, elephant from the notified protected area) as a centrifugal approach. Its attributes will be mentioned in this section along with the corridor/linkages/connectivity with the larger landscape. The map showing the zone of influence as described shall be placed as **ANNEX VI**. The GIS map showing the land use pattern upto ten km from the boundary of the PA shall also be placed as **ANNEX VII**. The notification of the ESZ (final or draft as the case may be) shall be placed as **ANNEX VIII**.

2.4 Statement of Significance

Each protected area is declared as such with a specific purpose. uniqueness on national and state level and/or landscape level or in other words ‘niche value’ should be highlighted. Besides the species of high importance, the Protected Areas should also take into consideration other values like the designation of the site as a Ramsar site or World Heritage site, among others. The statement of significance for the PA shall include the purpose, conservation value of the PA in the following terms:

- Ecological/Biodiversity – floral and faunal
- Socio-cultural – local communities in and around the protected area
- Ecosystem services – rivers, lakes, habitat
- Connectivity/Linkages

2.5 Approach and Access

Detailed transport links including road, to reach the protected area shall be described in this section. The details of rights to access and various rights of way given in the PA shall be mentioned in the **ANNEX IX** in the following tabular format.

S.No.	From	To	Length	Width	Whether permitted when notified or recommended by the NBWL/ SCNBWL	G.O. no. and date of right or way/ Use permitted

2.6 Attributes of the Protected Area

2.6.1 Geology, Rock, and Soil

2.6.2 Terrain Characteristics

2.6.3 Climate

2.6.4 Water Resources ((Wetlands, river systems, drainage)

2.6.5 Forest Types, and cover attributes

2.7 Land Use Land Cover (LULC), including Change detection (over the past 3 decades)

- Land Use Classification – GIS map of the wherever possible shall be provided. Current GIS mapping shall be compulsorily provided.

2.8 Biogeographic Information

- PA vis-à-vis Biogeographic Region characteristics viz. Fauna, Flora, Habitats, and Trophic niches shall be described in this section.

2.9 Ecosystem Services in the PA

- Details of studies if any done regarding the ecosystem services from the PA shall be provided. If not done, plans if any, to carry out for the same shall

be spelt out in this section. The possible ecosystem services from the PA shall be described in this section.

2.10 Socio-economic and Socio—cultural Profile

- Demographic profile
- Traditional use and indigenous knowledge
  - Inventory of available data
  - Existing Documentation and Dissemination efforts
  - Existing local narratives and toolkits (Participatory Rural Appraisal, Multi-stakeholder dialogues, and knowledge exchange plat forms)
- Landuses–past and present
- Resource dependency of communities such as minor forest produces collection
- Peoples Biodiversity Register
- Local biological/natural resources

2.11 Peripheral land uses

- Stakeholders in the landscape and forest resource dependency
- Major Production Sectors, intensive land uses within the landscape
- Eco-sensitive zone
- Socio-Economic Profile of villages in the zone of influence
- Major Infrastructure and mitigations therein
- Forthcoming major projects/land use change, if any within the landscape
- Status of corridor linkages

Chapter 3 History of Past Management and Present Practices

3.1 Management History = This may include sections like evaluation of conservation strategies, activities, etc.) This section shall include all forestry management practices prior to notification as PA and subsequent management practices since its notification. The major prescriptions made under successive working plans year – wise for the PA shall be narrated. The section shall provide details under the following heads:

- Conservation History
- Conservation strategies employed
- Forestry management practices; historic and present
- Socio-cultural dynamics within the landscape and its management.

3.2 Habitat Management and Protection – This section shall describe the details of habitat management and improvement works, management details/protection infrastructure of the park as follows:

- Habitat management regimes
- Ongoing management practices

3.3 Lease, if any - Leases under the Forest (Conservation) Act, if any will be discussed in this section if any portion of the PA is leased out to another agency/body. The details shall be provided in **ANNEX -X** in the following tabular format.

S.No.	Lease type	G.O. number and date	Period of lease	Lease rent if any

3.4 Eco-Tourism and Interpretation: This may comprise past practices on tourism including ecotourism, organising for tour management in the PA, accommodation of tourists, patterns of activities within the park (safaris, trekking, etc), revenue collected as entry fee, studies on carrying capacity, visitor flow management, closed periods, implementation of mitigation plans, new activities undertaken, etc.

3.5 Research, Monitoring, and Capacity Building

- Activities/Practices, policies, and guidelines therein
- Agenda and strategies imbibed based on research findings - Research policies and guidelines, agenda and strategies, information storage and retrieval system, including summary on the findings from the various research activities carried out in the PA. This section will also provide the details of the research permissions given under section 12 of the Wild Life (Protection) Act, 1972 till date, the use of those research findings in the management of the PA in the past.
- Monitoring and evaluation protocols used in the PA till date – this section will also describe the details of management effectiveness evaluation carried out till date for the PA and the recommendations made successively in the different cycles along with the details of action taken on those recommendations.
- Capacity building workshops and training – Target group - Institutional strengthening, trained staff, capacity building programmes, refresher training schedule etc.

3.6 Administration and Organisation

- Administrative setup, tenure details, range-wise read for administrative jurisdiction, core, ad-hoc staff strength, etc.

- Including table/details of Human Resources available cadre wise vis a vis approved staff strength, no. of subdivisions, ranges, sections, beats, etc., and their area statement

Chapter 4 Management Issues for Protected Area

4.1 Appraisal of empirical findings

- habitat selection by major herbivore/omnivore species including livestock along anthropogenic stress gradient during pinch and other seasons
- densities of major herbivores for above comparison using trail-based distance sampling
- habitat and terrain (GIS wing of the State)
- status of protected area linkages with nearby areas
- ungulate distribution
- wild herbivore crop damage across seasons
- carnivore conflict data
- elephant distribution (if present or frequented)
- habitats of endangered arboreal animals (use expert knowledge as well)

4.2 Identification of Management Issues in the PA - This will include the identification of issues and management solutions through detailed consultations and impact assessments and action points from points 3.1 and 3.2

4.3 Important Management Issues

- Agro-Pastoral history /status, anthropogenic changes, if any, and relocation history
- Resource dependency of local people
- Major Infrastructure and mitigations, if any
- Human-Wildlife Conflict (including 10 years of data, patterns if any, key species, and identified hotspots)
- Encroachment
- Invasive Species
- Forest Fires
- Pollution
- Tourism
- Shifting Species Boundaries
- Habitat degradation
- Status of interdepartmental coordination and existing mechanisms for convergence, if any
- Solid waste management
- Illegal wildlife trade and poaching

- Status of capacity building and skill development
- Landscape epidemiology
- Vulnerability Mapping
- Any other issues, not listed above

Chapter 5 Vision and Objectives for the PA and surrounding landscape

5.1 Overall Vision and Management Strategy

- Vision, Objectives, and actions
- Vision
- Management Goal
- Management strategy
- Objectives
- Perceived Issues in achieving objectives.

The Vision statement will provide the primary aim for managing the protected area in the landscape. It will consider the social, technical, environmental, economic, and developmental dynamics. It will be a short statement that encompasses all intrinsic and extrinsic factors while giving a management perspective. The section will also deal with the objectives that will follow from the vision and will be set in terms of future targets. These are specific statements of intentions with a set-out list of measurable outcomes which are to be fulfilled to achieve the vision. The objectives may be specific relating to the different functions of the protected areas; conservation of target species, Sustainable tourism, biodiversity management, sustainability of river/water systems/unique habitats, and their role in the landscape, among others.

5.2 Strength Weakness Opportunity Threat (SWOT) assessments

The SWOT assessment will provide a comprehensive list of issues (perceived/real) vis-à-vis the vision and objectives.

5.3 List of Zone (specific to certain zones/beats/habitats) and Theme Plans (overlapping)

This section will deal with defining and focusing on the objectives guiding various management activities within the protected area such as;

5.3.1 List of Zone Plans (management prescriptions for a specific portion/habitat/purpose)

- Special ecosystem/habitat measures (ex: management prescriptions for Grassland/wetlands/Aquatic/others)
- Focal species/Species of special concern/High Conservation Value (HCV) areas - species conservation/recovery plan and habitat management, including assessment of habitat carrying capacity for focus species
- Inter-state/transboundary collaboration (for habitat portions on such boundaries)
- Ecotourism
- Areas with human settlements (voluntary village relocation)/heavy resource dependency
- Ant other Zone Plans (as per specific habitat/ecosystem requirement)

5.3.2 List of Theme Plans

- Protection (Security Plan)
- Mobility/Infrastructure management (road/rail/waterways network inside PA boundaries)
- Protected Area Technology Infrastructure development (state-of-the-art technology)
- Staff Development and Capacity Building
- People-Wildlife Interface conflict issues
- Wildlife Monitoring
- Soil and Water Conservation
- Prophylactic interventions/Prevention of zoonotic diseases and One health approach
- Disaster Risk Management
- Fire Management
- Retrofitting Measures – Smart Green Infrastructure
- Cultural heritage management

Detailed management interventions for specific zones and theme plans will be listed in 6.1 and 6.2.

Chapter 6 Proposed Management Interventions for PA

Based on zone and theme plans listed in Section 5.3, management prescriptions will be provided for the zone (specific area/habitat) and theme (overlapping). The measures employed to address the threats and issues will be tailor-made for each identified zone/theme keeping in mind the landscape, ensuring flexibility and achievability. Additionally, the proposed interventions will be sensitive to the ecological, cultural, administrative, and socio-political context of the landscape. Care will be taken to ensure that the community members and the villagers have a

sense of ownership over the management and implementation to ensure longevity and sustainability.

Each intervention will comprise detailed background information, approach, activities, operational timelines.

Steps in zone and theme planning

- Gathering existing information – primary surveys, secondary information, mapping and assessment
- Stakeholder department and community consultations for discussing proposed zone and theme plans
- Preparation of draft zone and theme plans
- Consultation and review
- Finalization of plan

6.1 Will deal with the specific interventions for each zone plan-

- Special ecosystem/habitat measures (ex: management prescriptions for Grassland/Aquatic/others)
- Focal species/Species of special concern/High Conservation Value (HCV) areas - species conservation/recovery plan and habitat management, including assessment of habitat carrying capacity for focus species
- Inter-state/transboundary collaboration (for habitat portions on such boundaries)
- Ecotourism
- Managing areas with human settlements/heavy resource dependency/voluntary relocation requirements/NTFP collection
- Other Zone Plans (as per specific habitat/ecosystem requirement)
- Ecological Restoration (including wetland restoration)
    - Mapping of potential sites
    - Scale and timeline of restoration efforts
    - Restoration activities
    - Multi-stakeholder partnerships
    - Possible ecological, economic and social outcomes
    - Protocol for pre and post monitoring (restoration indicators for biodiversity; restoration indicators for people) to measure success

6.2 Will deal with the specific interventions for theme plan

- The interventions prescribed within this section will deal with how the actions align with the objectives to achieve the vision. The interventions will be activity based with set targets and identifiable indicators to measure action. Protection (Security Plan)
    - Security Audit of site

    - Existing protection infrastructure
    - Normative for new deployment (camps/personnel per unit area)
    - Protection coverage mapping/Hotspots
    - State-of-the-art range office/stations – equipped with technology, monitoring and patrolling equipment – each forest range linked to a main PA control room
    - Patrolling SOP – app based/manual
    - Mobility/Infrastructure management (road/rail/waterways network inside PA boundaries)
    - Protected Area Technology Infrastructure development (state-of-the-art technology)
- Staff Development and Capacity Building
- Eco development in peripheral areas and People-Wildlife Interface conflict issues – strengthening Eco Development Committees and Biodiversity Management Committees
- Addressing Forest Resource Dependency
- Wildlife Monitoring
- Soil and Water Conservation
- Prophylactic interventions/Prevention of zoonotic diseases and One health approach
- Disaster Risk Management
- Fire Management
- Retrofitting Measures
- Maintenance of water points/other welfare factors
- Cultural heritage management

Chapter 7 Research, Monitoring, and Training

7.1 Research

7.1.1 Research Priorities

Identification of the main thrust areas and priorities for research in the PA, infrastructure required to work on the identified priorities, setting up of research advisory committees, and scoping the funding for the research will be added.

7.1.2 Research Projects

- Research themes
- Compilation/Summary of available research outputs
- Proposed research programs – on habitat, species ecology, recovery planning, socio-cultural and socio-economic, finance, livelihood and eco- development

7.2 Monitoring

7.2.1 Identification of site-specific monitoring themes

7.2.2 Monitoring indicators

(Identification of monitoring/performance indicators will be done as per the management objectives with sub-indicators for each monitoring area). The performance indicators will be selected through a detailed stakeholder consultation with relevant stakeholders of the region)

7.2.3 Monitoring and Evaluation Framework – including linkages to SDG/CBD/climate goals/other national/international targets

7.3 Capacity Building (to be in sync with the theme plan for staff development and capacity building)

7.4 Maintenance of Control forms are to be provided and maintained for each PA.

Control forms are forms to record events and management activities, problems and their magnitude, events that are important from a management standpoint, and to track management activities. Control forms would be used as a reference for management during the revision of plan/management/review/mid-course corrections.

Chapter 8 Organisation, Administration, and Budget

8.1 Establishment of Steering Committee

The steering committee will include stakeholders from the relevant agencies to assess the effectiveness of the management plan through scheduled reviews.

8.2 Coordination with Line Agencies/ Departments

The effectiveness of proposed management interventions especially beyond the PA into the ZOI will require coordination with different line agencies and departments. The relevant stakeholders in direct line with the PA will be listed for coordination and mobilization.

8.3 HRD/Staff Deployment

8.4 Fund-Raising Strategies

- Leveraging support from ongoing Government schemes (State and Centre)
- CSR contributions
- Contributions from expert organizations for special requirements/tasks (capacity building, wildlife monitoring, community stewardship, RRT deployment, etc.)
- Recycling of gate receipts/souvenir sales
- Accessing Carbon/green funds and green financing (bonds, trust funds, etc.)

8.5 Schedule of Operations

This section includes the proposed timeline for achieving the objectives identified for action. A timeline spread out across the years of the plan will give an illustrative view of how progress will be qualitatively and quantitatively seen.

8.6 Plan Budget

This will help illustrate the process of costing in the different elements identified for each action aiding financial planning over a 5-to-10-year period (tentative).

Part B

Suggestive Prescriptions for management of the Peripheral Zone of Influence (ZoI)

(Including actions for syncing of the ESZ Zonal Master Plan as per the MoEFCC format) B1 – Eco-Sensitive Zone

- ESZ description and extent
- Activities/Interventions provided in the ESZ notification/Zonal Master Plan (ESZ) as per the provisions governed by the provisions of the Environment (Protection) Act, 1986
- Monitoring Committee and TOR as per ESZ notification

B2 – Zone of Influence (ZOI) - in sync/complementary to the ESZ Zonal Master Plan, but not prohibitory

The planning process for ZoI – Landscape Approach

- Envisioning and Perspective for the ZoI landscape
- Scoping for the legal basis
- Building up baseline profiles (District level)
- Stressors – Man-Geopolitical and ecological information
- Socio-demographic information
- Public infrastructure and services
- Public health profile
- Stressors – man-made and natural
- Socio-economic and Socio-cultural Indicators
- Categorization of transformed categories within the envisioned landscape - Transformation categories within the ZoI - altered (urban/townships); semi- altered (rural-forest interface); least altered (other PAs/forest habitats)
- Biodiversity, Conflict, Extended habitat scoring for prioritization within the landscape

- Participatory process/consultations with community and line agencies for defining Action portfolio towards inter-sectoral convergence, engagement, and reciprocal commitments
- Menu of Possible Managerial Options for field actions (inclusive portfolio of actions – PA/non-PA for stakeholders and biodiversity conservation)
- District level consolidation
- Implementation/Funding
- Steering and Coordination mechanism
- Monitoring and Evaluation

References

List of Appendices

This will include all relevant and compiled data/information relating to the management of the PA such as all notifications/circulars constituting the PA, guidelines, committees; flora and fauna indicating threatened and invasive alien species status; administration and protection infrastructure such as buildings, anti-poaching camps, vehicles and boats, working elephants, wireless communication network; habitat attributes; staff; arms and ammunition; tourism and interpretation facilities; visitors and revenue statistics; roads, patrolling path; expenditure; list of research projects/studies undertaken and publications; any other relevant information for the area).

Photographs

Maps

C-II MARINE PROTECTED AREA (INCLUDING ZONE OF INFLUENCE SUBSUMING ESZ)

DURATION OF PLAN Add
LIST OF MAPS Add
LIST OF TABLES
EXECUTIVE SUMMARY
The LEGAL AND REGULATORY COMPLIANCE

Chapter 1 Introduction to the Marine PA and Background Information

1.1 Name and Status of Constitution/Notification
1.2 Map of MPA
1.3 Location, Physical Boundaries, and Extent
1.4 Indicative Extent of the zone of influence (ZoI)/landscape
1.5 Statement of Significance

- Uniqueness on national and state level and/or landscape level or in other words 'niche value' should be highlighted.
- Besides the species of high importance, the Protected Areas should also take into consideration other values like the designation of the site as a Ramsar site or World Heritage site, among others

Chapter 2 Profile of the Marine Protected Area

2.1. General Information
2.2. Current Land Uses/Activities in the Area
2.3. Biophysical Condition

- Seagrass
- Mangrove
- Corals
- Marine species diversity (floral and faunal)

2.4. Socio- economic and Socio-cultural profile /Coastal and Island Community description

2.5 Map and limits of Coastal Regulation Zone (CRZ)

Chapter 3 History of Past Management and Present Practices

3.1 Management History

(This may include sections like evaluation of conservation strategies, activities, etc.) This section should include all Forestry management practices prior to notification as PA and subsequent management practices.

3.2 Habitat Management and Protection

(Details of habitat management and improvement work/management details/protection infrastructure of the park)

3.3 Eco-Tourism and Interpretation

(This may comprise past practices on tourism including ecotourism, organising for tour management in the PA, accommodation of tourists, patterns of activities within the park (marine excursions), revenue collected as entry fee, studies on carrying capacity, visitor flow management, closed periods, implementation of mitigation plans, new activities undertaken, etc.)

3.4 Research, Monitoring, and Capacity Building

Research: Research policies and guidelines, agenda and strategies, information storage and retrieval system, including summary on the findings from the various research activities carried out in the PA

Monitoring: Monitoring and Evaluation practices used in the PA to date

Capacity Building: Institutional strengthening, trained staff, capacity building programmes, refresher training schedule etc.)

3.5 Administration and Organisation

(Flow chart for the administrative setup, tenure details, range-wise read for administrative jurisdiction, core and ad-hoc staff strength etc.)

- Including table/details of Human Resource available cadre wise vis a vis approved staff strength, no. of sub divisions, range/section, any other unit

Chapter 4 Management Issues for Protected Area

4.1 Identification of Management Issues in the PA

(This will include the identification of issues and management solutions through detailed consultations and impact assessments. This will include the ESZ area/Zone of Influence (ZoI))

4.2 Important Management Issues

(Following is a suggestive list of themes for exploring management interventions. This activity should be accompanied by the preparation of impact-specific vulnerability maps)

- Existing impacts from anthropogenic activities – marinescape and adjoining coastal lands
- Solid waste management
- Fishing and local use
- Status of staff capacity building and skill development
- History/Status of offshore explorations
- Local resource dependency
- Any other issues, not listed above

Chapter 5 Vision and Objectives for the PA and surrounding landscape

5.1 Overall Vision and Management Strategy

5.2 Strength Weakness Opportunity Threat (SWOT) assessments

5.3 List of Zone (specific to certain zones/beats/habitats) and Theme Plans (overlapping) Chapter 6 Proposed Management Interventions for MPA

Each intervention will comprise detailed background information, approach, activities, line departments/organisations involved, and the year-wise timeline.

6.1 Zone Plans (Zoning)

- Marine area habitat management (Maintaining pristine habitats and exploring potential for restoration of corals/seagrass/native biota)
- Focal species/Species of special concern/High Conservation Value (HCV) sites
- Ecotourism
- Solid waste Management

6.2 Theme Plans (Overlapping)

- Protection (Security Plan)
  - Security Audit of site
  - Existing protection infrastructure
  - Emergency Response Units/life guard camps and facilities
  - Normative for new deployment (mobile/water camps/beach camps/personnel per unit area)
  - Protection coverage mapping/Hotspots

- State-of-the-art range office/stations – equipped with technology, monitoring and patrolling equipments – each forest range linked to a main PA control room
- Patrolling SOP – app based/manual
- Protected Area Technology Infrastructure development (state-of-the-art technology) for marine areas

- Staff Development and Capacity Building
- Marine species Monitoring
- Prophylactic interventions/Prevention of zoonotic diseases and One health approach
- Disaster Risk Management
- Retrofitting Measures
- Cultural heritage management

6.3 Coastal Community Plan - Sustainable management in partnership with Coastal communities

- Participatory planning and steward groups for managing the MPA
- Precision skilling and training for marine ecotourism and income generation
- Community led solid waste management
- Community based monitoring
- Local Livelihood opportunities and possible partnerships with Government and private sector to strengthen local economy vis-à-vis conservation of the MPA

Chapter 7 Research, Monitoring, and Training

7.1 Research

7.1.1 Research Priorities

(Research priorities for the PA will be identified and discussed in detail; infrastructure, research advisory committee, research funding, identification of thrust areas and topics, etc.)

7.1.2 Research Projects

(National and international)

7.2 Monitoring

7.2.1 Identification of site-specific monitoring areas

7.2.2 Monitoring indicators

(Identification of monitoring/performance indicators will be done as per the management objectives with sub-indicators for each monitoring area). The

performance indicators will be selected through a detailed stakeholder consultation with relevant stakeholders of the region.

7.2.3 Monitoring and Evaluation Framework – including linkages to SDG/CBD/ climate goals/other national /international targets

7.3 Capacity Building (to be in sync with theme plan for staff development and capacity building)

7.4 Maintenance of Control forms are to be provided and maintained for each PA

(Control forms are forms to record events and management activities, problems and their magnitude, events that are important from a management standpoint, and to track management activities. Control forms would be used as a reference for management during the revision of plan/management/review/mid-course corrections)

Chapter 8 Ecotourism

- Tourism significance
- Delineation of tourism zone – recreational and marine excursion activities
- Estimation of tourist carrying capacity
- Marine Interpretation facilities
- Communications strategy and dissemination material to foster ecotourism (vis-à-vis carrying capacity)
- Promote other surrounding areas with tourism significance

Chapter 9 Climate Action Plan

- Climate Change Mitigation efforts – Climate change mitigation practices in vogue (how existing zone and theme plans contribute to CC mitigation)
- Climate smart village planning – carbon neutral/negative eco development and livelihood practices in peripheral coastal and island community settlements

Chapter 10 Organisation, Administration, and Budget

10.1 Establishment of Steering Committee
10.2 Coordination with Line Agencies/ Departments
10.3 HRD/Staff Deployment
10.4 Fund-Raising Strategies

- Leveraging support from ongoing Government schemes (State and Centre)
- CSR contributions
- Contributions from expert organizations for special requirements/tasks

- Recycling of ecotourism receipts
- Accessing Carbon/green funds and green financing (bonds, trust funds etc.)

10.5 Schedule of Operations

10.6 Plan Budget

C-III CONSERVATION RESERVE (CR)

DURATION OF PLAN Add

LIST OF MAPS Add

LIST OF TABLES

EXECUTIVE SUMMARY

The LEGAL AND REGULATORY COMPLIANCE (PLANNING CONTEXT)

Chapter 1 Introduction and Background Information

- **1.1 Name and Status of Constitution/Notification**
- **1.2 Map of Conservation Reserve**
- **1.3 Location, Physical Boundaries, and Extent**
- **1.4 Indicative map to depict connectivity with other Pas, CRs, biodiversity rich sites**
- **1.5 Statement of Significance**

    - Ecological importance in the larger landscapes (may form part of corridor/natural connectivity, unique/endemic biodiversity, indigenous and traditional knowledge, among others)

Chapter 2 Profile

- **2.1 General Information**
- **2.2 Current Land Uses/Activities in the Area**
- **2.3 Terrain Characteristics**
- **2.4 Water Resources (Wetlands, river systems, drainage)**
- **2.5 Forest Types, and cover attributes**
- **2.6 Flora and Fauna**
- **2.7 Corridor linkages**
    - **2.7.1 Natural**
    - **2.7.2 Anthropogenic**
    - **2.7.3 Functionality (only for movement/movement and short stay/movement stay and reproduction)**

- **2.8 Socio- economic and Socio-cultural profile /Coastal and Island Community description**
- **2.9 Traditional and Indigenous Knowledge**

- Inventory of available data

- Existing Documentation and Dissemination efforts
- Existing local narratives and toolkits (Participatory Rural Appraisal, Multi-stakeholder dialogues, and knowledge exchange platforms)

Chapter 3 Present Management and Practices

3.1 Management History

(This may include sections like evaluation of conservation strategies, activities, etc.) This section should include all Forestry management practices prior to notification as PA and subsequent management practices.

3.2 Habitat Management and Protection
3.3 Forest Resource dependency of local communities/Major Land use in larger landscape
3.4 Eco-Tourism and Interpretation
3.5 Monitoring: Monitoring and Evaluation practices used in the CR to date
3.6 Administration and Organisation – Structure and

Responsibilities Chapter 4 Corridor status and functionality

4.1 Types of corridor
4.1.1 Fragmentation analysis
4.1.2 Natural
4.1.2.1 Functional status
4.1.3 Anthropogenic status
4.1.3.1 Functional status
4.2 Areas favouring only movement
4.3 Areas favouring movement and short stay
4.4 Areas with potential for movement, stay and reproduction

Chapter 5 Managerial strategy (corridor management) with thematic actions

5.1 Action portfolio for maintaining functionality
5.1.1 Day to day monitoring (traditional and state of the art)
5.1.2 Safeguarding against intensive landuses
5.2 Action portfolio for dealing with human-wildlife interface
5.2.1 Preventive measures
5.2.2 Control measures
5.3 Action portfolio for active management
5.3.1 Translocating reproductive (prey/predator) surplus above carrying capacity in adherence to Standard Operating Procedures

Chapter 6 Implementation strategy

(Dividing CR into sectors having village clusters)

6.1 Inclusive management

6.1.1 Village cluster level micro planning (Annexure 3.1)

6.1.2 Actions in sync with para 5.1 to 5.2 (separate chapters)

6.1.3 Agreed actions, quid-pro-quo

6.1.4 PES: Community stewardship remuneration

6.2 Monitoring performance

6.2.1 Performance Indicators

6.2.2 Monitoring and evaluation by the committee constituted under Section 36B of the Wild Life (Protection) Act, 1972

Annexure -3.1

Microplan format

Chapter 1 Profile of village cluster and surrounding forests

- Habitat
- Topography
- Major floral community
- Water availability
- Human settlements
- Natural and anthropogenic stressors
- Human-Wildlife interface
- Forest resource dependency of local people

Chapter 2 Corridor status and functionality

- Natural (vegetal, non-vegetal)
- Manmade artifacts
- Functional status
- Prominent wildlife species using corridors
- Linkages favouring only movement of wildlife
- Linkages favouring movement and brief stay of wildlife
- Linkages with potential as habitat for stay and reproduction (stepping stone?)
- Stressors impacting natural corridors

Chapter 3 Corridor management: inclusive/co-occurrence strategy Action portfolio 1

- Standardizing day to day monitoring protocol of corridor linkages/habitat (frontline/community stewards-on payment basis under Payment for Ecosystem Services)
- Data collection relating to corridor usage (functionality)
    - use of camera traps and creating a repository of photo captures
    - direct observations
    - collection of evidences
    - maintenance of community level wildlife register and periodic reporting to forest frontline staff

Action portfolio 2

- Safeguarding against intensive landuses
    - providing retrofittings
    - implementing eco-friendly mitigation measures
    - avoiding crucial areas

Action portfolio 3

- Human-Wildlife interface
  - preventive measures
  - control measures
  - establishing community control room linked to range headquarter
  - issuance of: forecast, alert

Action portfolio 4

- Active management
  - identifying reproductive surplus areas of resident wild animals
  - translocation to other areas to avoid human-wildlife conflict

Chapter 4 Reciprocal commitments between community and department, and indicators of success

- Enumerating reciprocal commitments between community and forest department (based on consultation)
- Fixing remuneration for community stewardship (under PES)
- Firming up indicators of performance
- Work schedule
- Awareness activity (Citizen Science)
- Conflict resolution (EDC/JFM)

Chapter 5 Implementation indicators

Activity	**Implementation indicators**
Standardising monitoring protocol	• Monitoring protocol in place for front line • Monitoring protocol in place for community stewards
Data collection for corridor functionality	• Development of camera trap repository • Catalogue of day-to-day observations • Catalogue of day-to-day evidences • Maintenance of community level register • Fixing IDs of resident/transient wild animals • Number of forecasts/alerts issued by control room • Mapping spatial presence of wildlife

	• Reduction in poaching
Safeguarding actions against int ensive landuses	• Number of retrofittings in place (as required) • Number of eco-friendly mitigation measures done • Number of avoidance areas • Reduction in wild animals in distress
Human-Wildlife interface	• Reduction in crop depredation by wild ungulates

	• Reduction in livestock/human depredation by carnivores • Reduction in human/livestock injury • Reduction in wild animals causing distress
Active management	• Number of translocations done as per Standard Operating Procedure • Reduction in human-wildlife interface problems • Reduction in retaliatory killings • Reduction in poaching

C-IV COMMUNITY RESERVE (Com.R)

DURATION OF PLAN

Add LIST OF MAPS

LIST OF TABLES

EXECUTIVE SUMMARY

The LEGAL AND REGULATORY COMPLIANCE (PLANNING CONTEXT)

Chapter 1 Introduction and Background Information

1.1 Name and Status of Constitution/Notification
1.2 Map of Community Reserve
1.3 Location, Physical Boundaries, and Extent
1.4 Indicative map to depict connectivity with other PAs, Community Reserves, biodiversity rich sites

1.5 Statement of Significance

- Ecological importance of the area in the context of wild flora/fauna habitat vis-à-vis local/traditional conservation values

Chapter 2 Profile

2.1 General Information
2.2 Current Land Uses/Activities in the Area
2.3 Terrain Characteristics
2.4 Water Resources (Wetlands, river systems, drainage)
2.5 Forest Types, and cover attributes
2.6 Flora and Fauna
2.7 Corridor linkages
2.7.1 Natural
2.7.2 Anthropogenic
2.7.3 Functionality (only for movement/movement and short stay/movement stay and reproduction)

2.8 Socio- economic and Socio-cultural profile /Coastal and Island Community description

2.9 Traditional and Indigenous Knowledge

- Conservation values, customs, totems
- Existing local narratives and documentation

Chapter 3 Present Management and Practices

3.1 Management History

(This may include sections like evaluation of conservation strategies, activities, etc.) This section should include all Forestry management practices prior to notification as PA and subsequent management practices.

3.2 Managerial interventions in-vogue
3.3 Village level administrative structure

Chapter 4 Land parcels for in-situ conservation actions

4.1 Types of potential land parcels for conservation actions
4.2 Proximity of conservation land parcels near settlements and stressors
4.3 Categorising conservation action areas for: food, water, shelter

Chapter 5 Managerial strategy (in-situ community driven management) with zoning and thematic actions

5.1 Action portfolio for denning/shelter/nesting areas (zone plan)
5.2 Action portfolio for protection through community stewardship (theme plan)
5.3 Action portfolio for day to day monitoring (community stewardship)
5.4 Local citizen science for awareness and community support (thematic)
5.5 Mutually gainful agreed actions

Chapter 6 Implementation strategy

(Dividing Community Reserve into sectors having village clusters)

6.1 Inclusive management
6.1.1 Village cluster level micro planning (Annexure 3.2)
6.1.2 Actions in sync with para 5.1 to 5.5 (separate chapters)
6.1.3 Agreed actions, quid-pro-quo
6.1.4 PES: Community stewardship remuneration
6.2 Monitoring performance
6.2.1 Performance Indicators
6.2.2 Monitoring and evaluation by the committee constituted under Section 36D of the Wild Life (Protection) Act, 1972

Annexure -3.2

Microplan format

Chapter 1 Profile of village cluster and surrounding forests

- Habitat
- Topography
- Major floral community
- Water availability
- Human settlements
- Natural and anthropogenic stressors
- Human-Wildlife interface
- Socio-cultural traditions: veneration of live-forms, if any
- Forest resource dependency of local people

Chapter 2 Faunal habitats warranting conservation actions

- Unique habitats and resident fauna (including meso-predators and avifauna)
- Natural and anthropogenic stressors on wildlife and their habitats
- Syncing faunal status with NTFP calendar?
- Periodicity of environmental stochastic events, if any (flooding, island accretion and the like)
- Vulnerability of flora/fauna
- Overlaps, if any between faunal/floral welfare factors and local forest resource dependency/customs

Chapter 3 Inclusive in-situ conservation

Action portfolio 1

- Mapping of welfare factors for local wildlife
  - shelter (denning sites, nesting trees, caves, tunnels and the like)
  - food (relative abundance of prey/forage-browse species)
  - water (perennial/annual sources, water points used by livestock and wildlife)
  - livestock disease prevalence

Action portfolio 2

Community driven conservation actions

- protection from poaching through gainful stewardship
- protection of welfare factors

- fine tuning of local customs/practices to safeguard welfare factors
- maintenance of community level floral/faunal register
- day-to-day monitoring of wildlife
- deployment of camera traps for ascertaining frequency of faunal species in an area
- mapping movement of large wild animals and fixing IDs of residents in the context of interface problems
- host community driven eco-tourism

Action portfolio 3

Evolving citizen science

- capacity building of community stewards in collation, assimilation of wildlife data, codification of local knowledge to complement scientific insights
- organizing local concerts based on folklore to spread awareness for wildlife
- recognizing good work towards conservation
- identifying local "champions" for wildlife cause
- codification of remuneration to local community under PES

Chapter 4 Reciprocal commitments between community and department, and indicators of success

- Enumerating reciprocal commitments between community and forest department (based on consultation)
- Fixing remuneration for community stewardship (under PES)
- Firming up indicators of performance
- Work schedule
- Awareness activity (Citizen Science)
- Conflict resolution (EDC/JFM)

Chapter 5 Implementation indicators

Activity	Implementation indicators
Mapping of welfare factors for local wildlife	• Local spatial occupancy maps of wild fauna • local mapping of habitats

Community driven conservation actions	• reduction in wildlife offence/ retaliatory killing/community hunting • wild floral/faunal abundance and increase in species diversity • reduction in man-made fires • revival of flow in perennial streams • increase in nest count, resident birds and winters visitors, waterfowl, if any • prophylactic immunization of livestock • reduction in human-wildlife conflicts and timely payment of compensation
Evolving citizen science	• increase in local volunteers/spearhead teams to foster awareness • increase in support for conservation ventures • active participation in wildlife conversation • increase in local "naturalists" for conducted excursions

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