Junglemahal Zoological Park

Master Plan

Duration: 2024-25 to 2044-45

Year of Submission

2024-25

Junglemahal Zoological Park Master Plan

Operator: West Bengal Zoo Authority, Government of West Bengal

Duration: 2024-25 to 2044-45

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Certificate

This is to certify that the Master Plan 2024-25 to 2044-45 for the scientific and long term captive management of Wildlife in Junglemahal Zoological Park, Jhargram has been prepared in consultation with technical advice from West Bengal Zoo Authority and suggestions of the designing guidelines from Central Zoo Authority.

Sri Pankaj Suryawanshi, IFS
Ex-officio Director,
Junglemahal Zoological Park
& Divisional Forest Officer,
Directorate of Forests,
West Bengal

Sri Saurabh Chaudhuri, IFS
Addl PCCF and
Member Secretary
West Bengal Zoo Authority
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Sri Debal Ray, IFS
PCCF (Wildlife) and
Chief Wildlife Warden
Directorate of Forests,
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The Master Plan of the Junglemahal Zoological Park, Jhargarm, West Bengal was placed before 99th Meeting of the EGZD, CZA and 102nd TC, CZA held on 22-23.06.2021 & 13.08.2021 respectively, wherein Master Plan was recommended for approval of CZA certain to compliance of observations. Subsequently, the CZA in its 38th Meeting held on 16.11.2021 approved the recommendations and ratified the action taken pertaining to 102nd TC, CZA. Approval was communicated to the Zoo vide letter Computer No. 165005 dated 09.09.2021. The zoo has submitted the satisfactory compliance vide letter dated 11.07.2024.

सदस्य सचिव/Member Secretary
केन्द्रीय चिड़ियाघर प्राधिकरण/Central Zoo Authority
पर्यावरण वन और जलवायु परिवर्तन मंत्रालय
Ministry of Environment, Forest & Climate Change
भारत सरकार, नई दिल्ली
Govt. of India, New Delhi

Member Secretary
Central Zoo Authority
Ministry of Environment, Forests, and Climate Change
Government of India

Junglemahal Zoological Park

Master Plan

2024-25 to 2044-45

Prepared by

Ex-officio Director, Junglemahal Zoological Park
Directorate of Forests,
West Bengal

Acknowledgement

My thanks are due to Sri Bhagwati Prasad Gopalika, IAS, Chief Secretary, Government of West Bengal and Chairman, West Bengal Zoo Authority and to Shri Manoj Kumar Agarwal, IAS, Addl. Chief Secretary, Department of Forests and Vice-Chairman, West Bengal Zoo Authority for their guidance to prepare this Master plan.

My sincere thanks to Sri Debal Ray, IFS, Principal Chief Conservator of Forests (WL) & Chief Wildlife Warden, West Bengal and Sri Saurabh Chaudhuri, IFS, Additional Principal Chief Conservator of Forests &Member Secretary, West Bengal Zoo Authority for their valuable suggestions and guidance in preparation of this Master plan.

The Master Plan is a combined effort of all the officials of West Bengal Zoo Authority. I would like to put on record the untiring efforts and contribution of Dr. Sulata Maity, Scientific Officer, Sri Asim Kumar Khan, Sub Assistant Engineer and Mrs. Anwesha Dey, Research Assistant of West Bengal Zoo Authority for the preparation of the Master Plan and Revised Master (Layout) Plan.

Lastly, I am indebted to Sri Sanjay Kumar Shukla, IFS, Member Secretary, Central Zoo Authority, Govt. of India and also to the members of the Technical Committee of the Central Zoo Authority for their suggestions and improving the draft of the Master Plan.

Ex-officio Director, Junglemahal Zoological Park &
Divisional Forest Officer, Jhargram Division
Directorate of Forests,
West Bengal

Preface

The design strategy combined with the extensive and in-depth knowledge of the zoo personnel forges a path ahead that is respectful to the animal and encouraging the visitor. The animal enclosures are designed as naturalistic environments while the visitor is moved across the garden in an immersive environment thus creating an emotional connect. This becomes a way for sensitizing the visitors to the animals. Strong enrichment policy embedded in the zoo will be taken further. The zoo aims to raise the benchmark in the enrichment provided to its residents. Despite being under developmental and commercial threat, the civic authorities are looking at ways to augment the present Junglemahal Zoological Park, to expand its physical limits along with expanding its meaning in the lives of the people.

The renovated precinct will provide more space to the animals to support their natural behaviour as well as more open spaces for people to have a leisurely visit. Though it will continue taxonomy and Bio-geography as its theme, the public open areas will try to resemble some of the specific environments. Overall, the zoo looks towards reinventing itself in a strong manner to become once again the locus of an urban citizen, thereby carrying forward the intention of awareness and sensitization to ecology.

Sri Saurabh Chaudhuri, IFS
Additional Principal Chief Conservator of Forests &
Member Secretary, West Bengal Zoo Authority
Directorate of Forests, West Bengal

Foreword

Zoos have evolved greatly throughout history, starting as menageries with cages and ending with the creation of a naturalistic setting for the animals with their welfare in mind. Around the world, a lot of work is being done to foster empathy for animals by creating immersive habitats that benefit both the animals and visitors. This approach not only shows the ecological relationships observed in nature, but it is also educational. It makes people aware of the various types of animals there are in the different environments on the planet.

The Junglemahal Zoological Park is within a patch of natural forest at Khasjungle mouza, J.L No. 395 under Dhabani Beat of Jhargram Division at Jhargram. Present area of the Junglemahal Zoological Park is 22.488 Ha (55.570 Acre) will have plan to add 7.59Ha (18.749 Acre) of Land for development. In addition, Tiger Safari will be developed within an area of 26.53Ha land (65.55 Acre).

The development of the Junglemahal Zoological Park and its precinct is a key feature of Junglemahal. The Junglemahal Zoological Park was established in the year of 1980 as Deer Park**.**

Junglemahal Zoological Park was recognised by the Central Zoo Authority, Govt. of India, vide letter no. F. No 22-71/2004-CZA (457) (M), dated: 05.08.2005.

The zoo is a distinctive precinct that places animals, which ideally should have been able to wander the world in a free manner, in captivity. In an ideal condition, one would want a world without zoos. However, till the human race is able to bring about a balance to their development aspirations and the implications to the environment, zoos are the only refuge for many endangered and scheduled species.

Zoos are also the places where conservation breeding can occur in conditions that are protected. The Junglemahal Zoological Park envisions a world with compassion towards wildlife and obligation towards nature. It is committed towards protection and preservation of wild animal species and strives for a peaceful co-existence of development and conservation.

In addition, the Junglemahal Zoological Park incorporates the concern for the environment and outreach to the people with an aim to create empathy for the animals.

I am sure that this Zoo would be a must-see landmark for all animal lovers and international visitors to this great city.

Ex-officio Director, Junglemahal Zoological Park &
Divisional Forest Officer, Jhargram Division
Directorate of Forests,
West Bengal

Date: 09.07.2024

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Chapter I
INTRODUCTION

1. INTRODUCTION

The forests of Jungle Mahal which were held by Zamindars were maintained in a feudal tenure system. With the coming up of Bengal-Nagpur Railway lines from Kharagpur to Jamshedpur via Jhargram, the forests of this area became accessible. The value of forest produces suddenly increased as they could be transported to far off placed by rail with less cost and in quick time. The forests came to be recognised as a source of earning of higher return to the Zamindars. The forests of Jungalmahal were mostly owned by Nawab /Zamindars. The forests were in advanced stage of degradation brought about by ruthless exploitation by the Zamindars on a rotation of 4-5 years. This system of management of forests continued till 1948 when the Govt. of West Bengal started exercising control over the management of forests under the West Bengal Private Forests Act, 1948. But the situation did not improve much.

In 1953 Estates Acquisition Act came into force and the forests so long owned by private owners i.e. Zamindars were vested to Govt. since 1954-55 and onwards free from all encumbrances for scientific management and control. Subsequently possession of the forests was being taken by the Forest Department gradually depending upon the availability of records, evidences and Court's Orders.

However, by this time, the productivity of the forests had gone down to such a level that they could not meet the growing demands of forest produces from ever-increasing population of fringe areas and the country as a whole. The problem was further multiplied due to growing unemployment in the forest fringe villagers and lack of enough resources in the rural areas to tide over the situation. Uncontrolled religious tribal hunting is another cause of destruction of biodiversity of this region, which leads to make some species endangered.

However, over a period of time Junglemahal has lost a number of animals due to habitat degradation, and other related anthropogenic activities. Some of the animals which were once present but have been lost include Hyena, Wolf, Sloth Bear, Dhol. An extended area of 22.488 hectare has been taken up at Jhargram in Junglemahal to develop the Junglemahal Zoological Park with the objective of conservation of rich bio-diversity of

the region, breeding of endangered species, scientific research and to develop empathy amongst the visitors towards the conservation of the eco-system and scientific research.

The preparation of Management Plan is a complex subject which involves inputs from zoo professionals, architects, veterinarians, environmentalists, and wild lifers. In consultation with a team of Zoo experts, Architects, Landscape designers, Environmentalists, Veterinarians, etc. the Management Plan has been prepared for development of the Junglemahal Zoological Park over a period of 10 years at the proposed site incorporating the vision, mission, theme of display and objectives.

The salient features of the Management Plan include displaying the biodiversity of Lateritic eco-system and displaying animal in their natural environment. All enclosures are as per guidelines of Central Zoo Authority (CZA) considering the welfare of the animals in their natural habitats of Lateritic eco-system. The visitors can view the animals from viewing area at certain points in front of each enclosure within the park. There will be segregation of visitor's trail and service path. The physical barrier will be chain link fencing. The Zoological Park will have one way movement of visitors. More than 90% of the area will be under Coppice Sal Forests and water bodies. The theme of display is taxonomical. Enclosures of species belonging to the Junglemahal forest specially, Spotted Deer, Sambar, Tiger, Birds, Fishing Cat, Bear, Hyena etc. will also be developed.

North/Western part of Jhargram Forest Division is the corridor of migration of Elephant of Dalma Reserve area of Jharkhand State to this part of the Forest of West Bengal. The migration of elephant is common phenomena of this region.

The animals Park has been divided into 4 sections viz., (i) Animal, Veterinary, and Commissary (Store), (ii) Administrative Security and Construction (iii) Sanitation, Horticulture and Maintenance and (iv) Education cum Research & Interpretation sections. Each section will be headed by a well qualified and professional incumbent in tune with the recommendation of expert committee on zoos.

In the plan, a well equipped veterinary hospital with diagnostic and testing facilities, supported by adequate technical manpower has been

proposed. The veterinarian will take a daily round of the animal park to observe the health, feeding and general hygienic condition of the animals.

The education cum research wing will enhance the knowledge and create awareness among visitors through signages, published materials, lectures and guided tours. It will also conduct studies on behaviour, growth and nutrition requirements of animals. There will be an Interpretation Centre within the park which will reflect the Lateritic eco-system and cultural heritage of Jhargram.

About 2-3 lakh visitors are expected to visit this place every year. This number is likely to increase in future. Efforts have been made to provide adequate facilities like cafeteria/kiosk, parking, toilets, shelters and drinking water points to the visitors for their smooth and rewarding visit.

In order to meet unforeseen incidents, a detail disaster management plan and contingency plan have incorporated. A plan to upgrade the skill of animal keeper and other staff, a capacity building plan has also been prepared. With the development in IT Sector, e-governance has also been proposed. This will help to maintain the record and data of animals and related issues for easy interaction with national and international experts and institutes.

The Junglemahal Zoological Park is directly under the control of Ex-Officio Director, and Divisional Forest Officer, Jhargram Division and Member Secretary, West Bengal Zoo Authority, Govt. of West Bengal. Junglemahal Zoological Park earlier known as Jhargram Zoo was established as a Deer Park in the year 1980 at Jhargram. Subsequently, it was recognised as Jhargram Zoo (Small Category Zoo) on 9th September 2005. The Central Zoo Authority, Govt. of India, renewed recognition of Junglemahal Zoological Park as a Medium category Zoo for a period of August 19, 2022 vide letter no F. No. 19-204/93-321CZA(NE) dt. 22.02.2021.

The Central Zoo Authority also evaluated the Junglemahal Zoological park on 01.09.2021. The evaluation was carried out by Shri Pradeep Kumar, IFS, retired, Ex-PCCF Wildlife & Chief Wildlife Warden, Jharkhand, Ex-chairman, Jharkhand Biodiversity Board.

The Junglemahal Zoological Park, Jhargram will be one of the role model in terms of facilities, infrastructure and management practices. Moreover, it will showcase the rich biodiversity of the Lateritic eco-system.

Junglemahal Zoological Park earlier known as Jhargram Zoo was established as a Deer Park in the year 1980, within a patch of natural forest at Khasjungle mouza, J.L No. 395 under Dhabani Beat of Jhargram Division at Jhargram. Subsequently, it was recognised as Jhargram Zoo (Small Category Zoo) on 9th September 2005 by Central Zoo Authority with the objectives of scientific management, conservation breeding of endangered species, high standard of maintenance for welfare of captive animals and also to develop empathy amongst the citizen of the area towards wildlife conservation, following the accepted norms and standard as framed by CZA.

1.1 History

In South-West Bengal (including the forests of Midnapore (erstwhile), Bankura and Purulia Districts), history of forest and its management can be traced to the 16th century when forests were free for use by local villagers for household purposes and clearing for cultivation. During Mughal period under land revenue system introduced by Todar Mal, local Zamindars had to pay ''RUBA" of 1/4th share of revenue to Mughal Emperors for the protection being given by them. In 1773 East India Company went for permanent settlement of forests (and the landed properties) with Zamindars as Proprietor. During 1890-1905 Bengal-Nagpur Railways opened railway lines (which helped transport of forest produce too far off places with ease and less cost) and this followed by two world wars took heavy toll of forest resources.

The forests of this area were included in Junglemahal which were held by Zamindars (local chiefs) who maintained their respective forests in a feudal tenure system. With the coming up of Bengal-Nagpur Railway lines from Kharagpur to Jamshedpur Via Jhargram, the forests of this area became accessible. The value of forest produces suddenly increased as they could be transported to far off places by rail with less cost and in quick time. The forests came to be recognised as a source of earning of higher

return to the Zamindars. The forests of this region were mostly owned by Nawab of Murshidabad, the Raja of Mayurbhanj, the Raja of Jhargram, Raja of Chilkigarh and the Midnapore Zamindar company, etc. The forests were in advanced stage of degradation brought about by ruthless exploitation by the Zamindars on a rotation of 4-5 years. This system of management (mismanagement) of forests continued till 1948 when the Govt. of West Bengal started exercising control over the management of forests under the West Bengal Private Forests Act, 1948. But the situation did not improve much.

In 1953 Estates Acquisition Act came into force and the forests so long owned by private owners (big Zamindars) were vested to Govt. 1954-55 onwards, free from all encumbrances for scientific management and control. Subsequently possession of the forests was taken over by the Forest Department gradually depending upon the availability of records, evidences and Court's Orders.

However, by that time, the productivity of the forests had gone down to such a level that they could not meet the growing demands of forest produces from ever-increasing population of fringe areas and the country as a whole. The problem was further multiplied due to growing unemployment in the forest fringe villagers and lack of enough resources in the rural areas to tide over the situation. Uncontrolled religious tribal hunting is another cause of destruction of biodiversity of this region that leads to make some species endangered.

1.2 Vision

The Junglemahal Zoological Park, Jhargram envisions a world with compassion towards wildlife and obligation towards nature. It is committed towards protection and preservation of wild animal species and strives for a peaceful co-existence of development and conservation.

1.3 Mission

- The Junglemahal Zoological Park, Jhargram, West Bengal intends to complement the national efforts in conservation of wildlife,through breeding of endangered species of theJunglemahal region and to

develop an empathy amongst the visitors for wild animals and motivate them to support conservation of wildlife.

- To act as a centre for receiving ill, injured, seized and orphaned animals of Junglemahal area of Wst Bengal for temporary shelter, treatment and release the same in wild subject to availability of suitable habitat or otherwise scientific upkeep with strict adherence to the guidelines framed for the purpose.

1.4 Objectives

A. Conservation Breeding:
Breeding and raising threatened animal species with the goal of preventing their extinction by replenishing zoos, and eventually enhancing the declining wild fauna.

B. Conservation Education:
To assist the growth of community conservation attitudes, conservation awareness, and capacity building.

C. Animal Housing:
To ensure housing of captive animals and birds with special emphasis on health care, ethical standards, animal welfare and excellent animal husbandry.

D. Awareness:
To serve the cause of Wildlife conservation by arousing interest and concern for wildlife by organizing exhibitions and seminars among public.

E. Conservation Research:
To facilitate research and scientific study on animal behaviour, behavioural and environmental enrichment, nutrition and reproductive biology.

1.5 Strategies

The Junglemahal Zoological Park is themed to display the animals found in the Junglemahal area in wild conditions and to appraise the visitors regarding their natural habitats and their conservation values, to understand biology, ecology and behavior of animals displayed. The

strategies are:-

Strategies

- To conserve natural resources.
- To develop, expertise in animal care, wildlife, education and awareness.
- To house and display of broad representatives of diverse and endangered animals and birds with emphasis on the Indian fauna belonging to the region (Lateritic Eco-system of Junglemahal), considering the climatic conditions suitable for them
- To display animals in pleasant and aesthetic natural settings in accordance with their habit and habitat specifications by developing infrastructure and service of high standard.
- To ensure standard animal health care and establish self sustaining populations of genetically and behaviourally viable animals

1.6 Topography

Junglemahal Zoological Park is located at Khasjunglemouza, J.L.No. 395 under Dhanani Beat of Jhargram Range of Jhargram Division. The topography is undulating with hard rock and morrum soil. The entire area comes under catchment of Subarnarekhariver. The latitude of the place is 22°26'59.80''N and longitude is 87°01.27.55''E. The altitude of the area is about 200m from the mean sea level.

1.7 Geology

The topography of the zoo is undulating with hard rock and morrum soil. The rock type of Arching and ferruginous concretions (due to the presence of sesquioxide type of clay) are present within the zoo.

1.8 Rock & Soil

This zoo area is having the main soil types (i) Lateritic Soil characterised by Silica leaching and sesquioxide enrichment and (ii) Alluvial soil.

Lateritic soil which covers maximum areas of the zoo may broadly be classified into 3 (three) categories.

(1) Red loams, characterized by argillaceous soil with a cloddy structure and presence of few concretionary materials. Textures vary widely from yellowish clay loam to pebbly sandy loam, are often underlain by compact morrum layer mixed with clay, or lie directly as capping on Archean rocks with either abrupt or transitionally grading boundary.

(2) Red earths or lateritic soils where the top soil is loose and friable but rich in secondary ferruginous concretions (due to the presence of sesquioxide type of clay). These are often underlain by hard morrum layer.

(3) Laterite soils where the surface is more akin to red earth but with the presence of definite flayer of vesicular mass in the sub-soil horizon are composed essentially of a mixture of the hydrated oxides of aluminium and iron.

1.9 Flora and fauna in Zoo premises

Flora (Existing):-

The zoo is spread over an area of 26.53Ha within a beautiful patch of coppice Sal forest of Lateritic zone (Annexure-IV)

Fauna (free living):-

The mammals, birds, reptiles and amphibians commonly encountered are small Indian mongoose, Grey Wolf, Pangolin, Spotted Deer, Rhesus Macaque, Crow, Herons, Owl, Bulbuls, Common myna, Cuckoo, Sparrow, Water hen, Moorhen, Ducks and various snakes & frogs (Annexure- IV).

1.10 Climate

In Jhargram, the climate in the area is dry in nature. The wet season is hot, oppressive, and overcast and the dry season is warm, humid, and mostly clear. Over the course of the year, the temperature typically varies from 11°C to 38°C and is rarely below 8 °C or above 45 °C.

The hot summer exits near about eight months in the year. The average temperature during summer lies between 30-400C which reaches up to 450C. The monsoon starts from the end of June and extends up to end of

August. The winter starts during the end of November and extends up to middle of February.

1.11 Rainfall

The average annual rainfall of Jhargram is about 1400 mm. The rainy season spreads over June to September due to south-west monsoon and highest rainfall occurs in July and August. The rainfall starts decreasing from October and dry winter sets in. The dry season lasts till May. However during this time this region gets some sporadic showers.

1.12 Temperature

Over the course of the year, the temperature typically varies from 11°C to 38°C and is rarely below 8 °C or above 45 °C. . The maximum average temperature is 10-120C in December and January. It is 15-200C in February,30-350C in March and 35-440C in April, May, and June. With the onset of monsoon, the average day temperature stabilizes at about 28-320C. Night temperature increases from 100C in January to 300C in June and it remains unchanged till September. In summer season temperature reaches up to 450C and in winter season it goes down to 60C in few occasions. It begins to fall to 250C in October, 150C in November and 130C in December.

1.13 Humidity

The atmosphere is highly humid throughout the year except February to May when relative humidity ranges flanked by 50% to 70%. The Highest humidity is 95% during July, August. In dry season the average humidity is 62-65%.

1.14 Seasons

The area experiences 3 (three) seasons in a year. The dry season lasts from March to early June, the wet season is from June to September and cold season covers the rest. The average temperature during summer lies

between 30-40^{0}C which reaches up to 45^{0}C. The monsoon starts from the end of June and extends up to end of August. The winter starts during the end of November and extends up to middle of February.

1.15 Approach

Area is situated within the municipal limits of Jhargram Town and it is 3 km. away from Jhargram Rly. Station. It is about 16 km. away from NH-6. There is a good network of road to approach Junglemahal Zoological Park, Jhargram. Nearest Airport is Kolkata which is 160 km away from the zoo.

1.16 Demography

The area of 22.488ha is covered by a beautiful patch of coppice Sal Forest. It has become a tourists spot along with the other famous places of Jhargram like Chilkigarh temple, Chilkigarh Rajbadi,Jhargram Rajbadi etc.. Zoo is surrounded on four sides by:

East side - Forest land

West side - Raiyat land

South side - Pacca Road and Forest

North side - Raiyat land

1.17 Legal Status of the Land

Junglemahal Zoological Park earlier known as Jhargram Zoo was established as a Deer Park in the year 1980, within a patch of natural forest at Khasjungle mouza, J.L No. 395 under Dhabani Beat of Jhargram Division at Jhargram. The legal status of the land enclosed as Annexure-VIII.

1.18 Sources of Pollution

No noticeable source of pollution exists in the area, rather the patch 56.6027 Ha. of forest area acts as potential carbon sink generated by Railways and vehicles.

Chapter II

APPRAISAL OF PRESENT ARRANGEMENT & CONSTRAINS

Junglemahal Zoological Park earlier known as Jhargram Zoo was established as Deer Park in the year 1980. The zoo is spread over an area of 22.448 ha with in a beautiful patch of coppice Sal forest of Lateritic zone having natural water body within the zoo area and perennial water course along the eastern boundary. Subsequently it was recognized as Zoo (small category zoo) on 9th September 2005 vide CZS notification no. 19-204/93-CZA(321)(Vat-11M) dated 9.8.2005. It was re-categorised as Medium Zoo by CZA vide F.No.18-1/2017-CZA(Vol.I)(AK) dated 21st November 2017.

The primary objective for creation of zoo at Jhargram was -

- To provide a place for recreation, education, research, conservation and captive breeding of birds, animals, reptiles etc.
- To create a natural environment for birds, animals and other creatures where they can live in simulated natural conditions, without fear and loss of their lives.

The priority of the zoo has been changed with more emphasis on conservation, education, research and recreation in conformity with the National Zoo Policy and modern zoo has to operate across the whole spectrum of conservation breeding of threatened species, research, education, training and capacity building. In the recent past there has been a paradigm shift in the zoo management globally.

To keep pace with the modern zoo management, Junglemahal Zoological Park is needed to be managed with the modern concept of zoo management, to convert it to a perfect showcase of Bio-diversity of Lateritic eco-system. Accordingly Master Plan is prepared as there is sufficient scope for further development, including increasing zoo area for proper housing, medical and health care, conservation breeding of endangered species of the region. It is further proposed to enhance the zoo area with the provision of the following details:

Appraisal of Present Arrangement and Constrains

2.1 Animal Section

Existing Inventory of Animals in captivity:

The Junglemahal Zoological Park has been categorised as Medium category Zoo by Central Zoo Authority of India.
Detailed list of animals is mentioned below:

TABLE : I

INVENTORY

Annual Inventory Report of Junglemahal Zoological Park, Jhargram
For the Year 2023-24 (from April 2023 to March 2024)

Endangered Species

Sl. No.	Animal Name	Scientific Name	Schedule (Wildlife act 1972)	Conservation Status (IUCN)	Opening Stock As on 01.04.2023				Birth			Acquisition			Disposal			Death			Closing Stock As on 31.03.2024			
Birds					**M**	**F**	**U**	**T**	**M**	**F**	**U**	**M**	**F**	**U**	**M**	**F**	**U**	**M**	**F**	**U**	**M**	**F**	**U**	**T**
1	Hawk	*Buteo jamaicensis* (Gmelin 1788)	**I**		0	1	1	**2**													0	1	1	**2**
2	Peaf owl	*Pavo cristatus* (Linnaeous, 1758)	**I**	**LC**	4	6	0	**10**											1		4	5	0	**9**
3	Pheasant Nepali Kalij	*Laphura leucomelana* (Latham, 1790)	**I**	**LC**	3	4	0	**7**							1	1		1	1		1	2	0	**3**

4	Vulture White Rumped	*Gypes bengalensis* (Gmelin 1788)	**I**	**CR**	0	0	1	**1**													0	0	1	**1**
5	Golden Pheasant	Chrysolophus pictus	**I**	**LC**	3	2	0	**5**													3	2	0	**5**
6	Silver Pheasant	*Lophura nycthemera*	**I**	**LC**	2	3	0	**5**										1			1	3	0	**4**
		Total			**12**	**16**	**2**	**30**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**2**	**2**	**0**	**9**	**13**	**2**	**24**
Reptile					**M**	**F**	**U**	**T**	**M**	**F**	**U**	**M**	**F**	**U**	**M**	**F**	**U**	**M**	**F**	**U**	**M**	**F**	**U**	**T**
1	Python Indian	*Python molorus* (Linnaeus, 1758)	**I**	**NT**	0	0	2	**2**													0	0	2	**2**
2	Monitor Lizard	*Varanus bengalensis* (Daudin, 1802)	**I**	**LC**	0	0	2	**2**													0	0	2	**2**
3	Turtle Indian Soft Shell	*Lissemys punctata punctata* (Lacepede, 1788)	**I**	**VU**	0	0	2	**2**													0	0	2	**2**
4	Turtle Spotted Pond	*Geoclemys hamiltonii* (Gray, 1831)		**EN**	0	0	21	**21**													0	0	21	**21**
5	Tricarinate Hill Turtle	*Melanochelys tricarinata* (Blyth, 1856)	**I**	**VU**	0	0	18	**18**												1	0	0	17	**17**
6	Cobra Indian /Monocellate	*Naja naja kaouthia* Lesson, 1831	**II**	**LC**	0	0	2	**2**													0	0	2	**2**
7	Cobra	*Naja naja*	**II**	**LC**	0	0	4	**4**													0	0	4	**4**

	Indian /Spectacled Cobra	(Linnaeus, 1758)																						
8	Viper Russel's	*Daboia russelii* (Shaw & Nodder, 1797)	**II**	**LC**	0	0	2	**2**												0	0	2	**2**
		Total			**0**	**0**	**53**	**53**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**52**	**52**
Mammal					**M**	**F**	**U**	**T**	**M**	**F**	**U**	**M**	**F**	**U**	**M**	**F**	**U**	**M**	**F**	**U**	**M**	**F**	**U**	**T**
1	Bear Sloth	*Melursus ursinus* (Shaw, 1791)	**I**	**VU**	0	3	0	**3**								1					0	2	0	**2**
2	Cat Fishing	*Prionailurus viverrinus* (Bennett, 1833)	**I**	**VU**	2	2	0	**4**	1	1											3	3	0	**6**
3	Wolf Indian	*Canis lupus pallipes*	**I**	**LC**	4	2	0	**6**	1	2					1			3			1	4	0	**5**
4	Leopard	*Panthera apardus*	**I**	**VU**	3	1	0	**4**	1	2					3				1		1	2	0	**3**
5	Cat Jungle	*Felis Chaus* Schreber, 1777	**II**	**LC**	4	1	0	**5**													4	1	0	**5**
6	Civet Asian Palm/ Common Palm Civet	*Paradoxurus hermaphrodites* (Pallas, 1777)	**II**	**LC**	4	1	0	**5**										1			3	1	0	**4**
7	Macaque Rhesus	*Macaca mullata* (Zimmermann, 1780)	**II**	**LC**	5	4	0	**9**													5	4	0	**9**
8	Sambar Deer	*Cervus unicolor*	**III**	**VU**	5	1	0	**6**										1	1		4	0	0	**4**

9	Porcupine Brush Tailed / Bengal/Indian crested	*Hystrix indica* Kerr, 1792	**IV**	**LC**	0	0	2	**2**				1	1								1	1	2	**4**
		Total			**27**	**15**	**2**	**44**	**3**	**5**	**0**	**1**	**1**	**0**	**4**	**1**	**0**	**5**	**2**	**0**	**22**	**18**	**2**	**42**

Other Species

Sl. No.	**Animal Name**	**Scientific Name**	**Schedule (Wildlife act 1972)**	**Conservation Status (IUCN)**	**Opening Stock As on 01.04.2023**				**Birth**			**Acquisition**			**Disposal**			**Death**			**Closing Stock As on 31.03.2024**			
Birds					**M**	**F**	**U**	**T**	**M**	**F**	**U**	**M**	**F**	**U**	**M**	**F**	**U**	**M**	**F**	**U**	**M**	**F**	**U**	**T**
1	Lesser Adjutant	*Leptoptilos javanicu*	**IV**	**VU**	0	0	1	**1**						1							0	0	2	**2**
2	Red Breasted Paraket	*Psittacula alexandri*	**IV**	**NT**	0	0	4	**4**													0	0	4	**4**
3	Paraket Large Indian/ Alexandrine Paraket	*Psittacula eupatria*	**IV**	**NT**	0	0	1	**1**													0	0	1	**1**
4	Rose Ring Parakeet	*Psittacula krameri*	**IV**	**LC**	0	0	6	**6**													0	0	6	**6**
5	Red Jungle Fowl	*Glaus glaus*	**IV**	**LC**	5	10	0	**15**											2		5	8	0	**13**
6	Lady Amh	*Chrysolophus*	**IV**	**LC**	1	1	0	**2**										1			0	1	0	**1**

	ersts	*amhersstiae*																						
7	Black Headed Munia	*Lonchura malaca*	**IV**	**LC**	0	0	0	**0**												0	0	0	**0**
8	Spotted Munia	*Lonchura punctulata*	**IV**	**LC**	0	0	1	**1**												0	0	1	**1**
9	Emu	*Dromaiusnovachollandiac*	**IV**	**LC**	3	2	0	**5**												3	2	0	**5**
		Total			**9**	**13**	**13**	**35**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**2**	**0**	**8**	**11**	**14**	**33**
Mammal					**M**	**F**	**U**	**T**	**M**	**F**	**U**	**M**	**F**	**U**	**M**	**F**	**U**	**M**	**F**	**U**	**M**	**F**	**U**	**T**
1	Bonnet Macaque	*Macaca radiate*	**II**	**LC**	2	0	0	**2**												2	0	0	**2**
2	Spotted Deer / chital	*Axis axis (Erxlebe n1777)*	**III**	**LC**	50	51	0	**101**	1	1								5	5		46	47	0	**93**
3	Striped Hyna	*Hyaena hyaena (Linnaeus 1758)*	**III**	**NT**	2	2	0	**4**								1					2	1	0	**3**
4	Nilgai/ Blue Bull	*Boselaphus tragucamelus (Pallas 1766)*	**III**	**LC**	11	18	0	**29**											3		11	15	0	**26**
5	Barking Deer	*Muntiacus muntjse (Zimmermann1 780)*	**III**	**LC**	8	17	0	**25**	2	2									1		10	18	0	**28**
		Total			**73**	**88**	**0**	**161**	**3**	**3**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**5**	**9**	**0**	**71**	**81**	**0**	**152**
Reptile					**M**	**F**	**U**	**T**	**M**	**F**	**U**	**M**	**F**	**U**	**M**	**F**	**U**	**M**	**F**	**U**	**M**	**F**	**U**	**T**
1	Indian Star	*Geochelone elegans*	**IV**	**VU**	0	0	11	**11**												2	0	0	9	**9**

	Tortoise	*(Schoeph 1801)*																						
		Total			**0**	**0**	**11**	**11**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**9**	**9**

Exotic

Sl. No.	**Animal Name**	**Scientific Name**	**Schedule (Wildlife act 1972)**	**Conservation Status (IUCN)**	**Opening Stock As on 01.04.2023**				**Birth**			**Acquisition**			**Disposal**			**Death**			**Closing Stock As on 31.03.2024**			
Birds					**M**	**F**	**U**	**T**	**M**	**F**	**U**	**M**	**F**	**U**	**M**	**F**	**U**	**M**	**F**	**U**	**M**	**F**	**U**	**T**
1	Finches	Taeniopygia guttata	**IV**		0	0	1	**1**												1	0	0	0	**0**
2	Cockatiel	Nymphicus Hallandicus	**IV**	**LC**	0	0	15	**15**													0	0	15	**15**
3	Bile & Gold Macaw	*Ara ararauna*	**IV**	**LC**	0	0	0	**0**				2	2								2	2	0	**4**
		Total			**0**	**0**	**16**	**16**	**0**	**0**	**0**	**2**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**2**	**2**	**15**	**19**

Ex-Officio Director
Junglemahal Zoological Park,
&
Divisional Forest Officer
Jhargram Division

Animal Section:
Staff engaged: Keeper: Two, Animal Attendant: Two
Constraints

a) Lack of adequately trained personnel

As the zoo is under developing stage, more trained personnel required in the zoo.

Mammal Section
Carnivores

i. Leopard Enclosure

This enclosure is existing at the eastern side of the zoological Park opposite to present turtle pond. The enclosure paddock area is 900 sqm attached with 1 craal, 4night shelter and a keeper's gallery. The enclosure is fenced with iron angle and chain-link. To ensure the protection energized fencing is provided at the top of the chain link fencing to prevent the escape of leopards from the enclosure. Present stock of Leopard is 3 (1:2) in Zoological Park.

ii. Hyena (*Hyaena hyaena*):

Hyenas are kept in an open enclosure having area 550 sqm surrounded by boundary wall (concrete) with dry mote, kraal and Night shelter besides Golden Jackal enclosure opposite proposed Wild Dog enclosure. There is a small tunnel like den made within the enclosure.

Enrichment:
(1) Logs are fixed for playing.
(2) Groove of bushes has been provided.
(3) Species appropriate vegetation was provided to provide adequate shade.
(4) Scratching posts has been provided to retain their natural behaviour.

iii. Indian Grey Wolf Enclosure

Indian Wolfs are kept in an enclosure of area 800sqm within natural patch of Sal (Coppice) tree surrounded by boundary wall made of cement concrete inside with dry mote and night shelter. Enclosure is just opposite to the existing Barking Deer Enclosure and besides Tiger enclosure. There are five (5) numbers of Wolves are housed in the Zooogical Park.

iv. Bengal Fox (*Vulpes bengalensis*)

Area for Bengal Fox is of 550sqm. with a patch of natural coppice Sal trees surrounded by boundary wall in four side with dry mote inside, with night shelter was developed beside Dhole enclosure. Landscape around animal exhibit/ enclosure comprised of plantations of appropriate tree and shrub

species of adequate extent and of such shape that the enclosure will not be visible to the visitors from any place other than the animal viewing areas. All the hard exteriors of the enclosure i.e. the enclosure barrier and the frontage of the night shelters will be effectively camouflaged through planting of bamboo, dwarf tree species and shrubs.
Zoological Park has a plan to acquire Bengal Fox in near future.

v. Golden Jackal (*Canis aureus*):

Golden Jackal enclosure **was constructed within a**n area of 550sqm at Junglemahal Zoological Park with a craal and night shelters. This enclosure is constructed in between Hyena and Civet enclosure (civet enclosures are proposed to be converted to Flying Bird Aviary). This enclosure is constructed in between Hyena and Civet enclosure. Zoological Park has a plan to acquire Bengal Fox in near future.

Bengal Fox and Golden Jackal enclosure enrichment plan:

Area proposed for enclosure	**<u>Enrichment</u>:**
550sqm	**Environmental (or structural) enrichments:** Trees, shrubs and structures providing shade will be provided for shade. Logs and Tree Branches: Big logs can be packed at angles to one another. Branches will be placed against logs or other objects. Logs and branches provide areas to hide and scatter food to encourage foraging as well as elevated areas to stand and lie on. Platform: Platforms provide an elevated place to view surroundings, provide a spot for sunning themselves and allow jackals to get off the ground when wet or muddy. We can feed our foxes on top of the platform. Privacy: Jackals are wary animals, even when used to

	human activity, and are very adept at concealing their presence under adverse conditions. Concealed private areas will be provided in fox enclosures. Shrubs, logs, areas of shade cloth, palm fronds and other tree branches, reeds or simple bamboo walls will be used to provide these. **Olfactory (or food-based) enrichments:** Hiding or Scattering Food: Jackals are foragers and hiding or scattering food in their enclosure encourages this natural feeding behaviour. Placing meals inside cardboard boxes or paper towel rolls forces our foxes to work for their food. Placing treats, such as pieces of meat, inside a hollowed-out pumpkin or watermelon with holes encourages foxes to try different retrieval techniques. Whole or partial carcasses can provide hours of stimulation and encourage natural scavenging and feeding behaviour as well as social interaction, including posturing and dominance/submissive displays, between animals. Bloodsicles and Milksicles: These are made by either freezing blood or a few pieces of meat or some kitty milk in small plastic containers and can be offered on warm days. Walking different types of animals on their leads past the fox enclosure provides much interest and visual stimulation. Rubbing coconut oil on objects such as logs and tree limbs will encourage much sniffing, licking, rubbing and rolling. Animal faeces, such as horse or elephant dung, results

	in much olfactory investigation. **Customised enrichments:** Foxes are naturally curious animals so any novel objects that encourage them to search, sniff, probe with nose or paw, chew, bury or squabble over provides good enrichment. Novel objects are a good way of hiding food and encouraging foraging behaviours.

Lesser Cat Enclosures

vi. Fishing Cat (*Prionailurus viverrinus*)

Fishing Cats are housed in an enclosure of 300sqm constructed opposite to Nilgai enclosure and Beside Reptile House. Present stock of the Fishing Cats is 6 (3:3) in the Zoological Park.

Enrichment Plan:

The landscaping in the paddock area will be created to simulate the habitat of the enclosure that is similar to a wetland. The habitat will be cultivated with different wetland vegetations such as *Typha selephantina Roxb*, *Saccharum spontaneum, Colocasia esculenta* etc. Besides, the area is enriched with different shade trees such as, *Vachellia nilotica*, *Mangifera indica, Citrus maxima* etc. Trees and logs shall be provided. A sizable natural pond will be created in both display and off display enclosure. In off display area pond, fishes will be reared, so that the captive bred individuals could retain their innate behaviour.

vii. Jungle Cat (*Felis Chaus*):

Jungle Cats are housed in an enclosure of 300sqm constructed opposite to spotted deer enclosure and Beside Reptile House. Landscape around animal exhibit/ enclosure comprised of plantations of appropriate tree and shrub species of adequate extent and of such shape that the enclosure has not been visible to the visitors from any place other than the animal viewing areas. All the hard exteriors of the enclosure i.e. the enclosure barrier and the frontage of the night shelters has been effectively

camouflaged through planting of bamboo, dwarf tree species and shrubs. Present stock of the Jungle cat in Zoological Park is 5 (4:1)

viii. Leopard Cat (*Prionailurus bengalensis*)

A Leopard Cat enclosure was made in within an area of 300sqm and in between Fishing Cat and Jungle cat enclosure opposite to spotted deer enclosure at the southern side of the Zoological Park. . However, their present stock is Nil. Lesser Adjutant Storks are now housed there at this enclosure. Once Water Bird Aviary will be constructed these birds will be shifted there.

Jungle Cat and Leopard Cat enclosure enrichment plan:

Area proposed for enclosure	Enrichment
240 sq.m	The small cat enclosures will be closed ones. There will be a night house on the rear end while the front will have viewing side through chain link fence. (i) Trees and logs shall be provided. (ii) Adequate shelter will be provided. (iii) A pond with live fishes will be created. (iii) Food will be provided 2 times a day. (iv) Laser Mouse: The red pin light pointing device. The cats will chase this thing anywhere; just don't point it in their eyes. Even during the day, the beam is bright enough to catch their attention. (v) A very inexpensive way to amuse cats for hours is to use paper towel, toilet paper and fabric tubes to hold various meats that aren't the cat's typical fare. The tubes are sometime sprayed with perfumes, or marinated in spices. (Vi) The cats will spend hours carrying the tubes around as if they caught the "prey" themselves. They roll on them, drool on them and eventually shred them to pieces to get to the good stuff inside. This stimulates all of their natural predatory instincts and provides a safe form of amusement.

ix. Pangolin Enclosure

There is a Pangolin enclosure was constructed opposite to Indian Wolf enclosure. However, Pangolin is not there, needs to be acquired from other recognized zoo.

Omnivores

x. Sloth Bear (*Melursus ursinus)*

Sloth Bear enclosure of an area 1000sqm was exist beside proposed Gharial enclosure and opposite to the existing Leopard enclosure surrounded by dry mote. The paddock area, kraal and night shelter with isolation facilities were developed for the better upkeepment of the animal. . There are 2 nos. female Sloth Bear are in Junglemahal Zoological Park. One male sloth bear is to be arranged through exchange from other zoo for pairing for the welfare of animals.

Area proposed for enclosure	**Enrichment:**
1000sqm.	**<u>Enrichment</u>:** **Environmental (or structural) enrichments:** These include platforms, hammocks, soft mud, swings, pools and strategically planted trees. Each of these enables the bears to exercise their climbing skills and build strength. Environmental enrichments also encourage the bears to use their long, inwardly curved claws to dig. Pools of water in their fields also allow them to splash around during hot summer months. **Olfactory (or food-based) enrichments:** These consist of structural enrichments that are smeared with a generous quantity of honey and peanut butter. Sloth bears are encouraged to use their acute sense of smell to trace them. Alongside, chopped fruits and treats like coconuts and dates are also provided to the

	bears. **Customised enrichments**: Items such as balls, pipe feeders, rolling barrel feeders, tyre feeders, and braid feeders comprise these enrichments. They are often filled with fruits or treats and strategically placed around the fields by our caregivers. Enrichments are customised for animals with special needs: geriatric, blind, injured, or disabled animals. For instance, bells are fastened to the hanging enrichments for blind animals so that the auditory cue makes it easier for them to locate it.

Herbivores

xi. Porcupine Enclosure

Area for Porcupine enclosure was 200sqm at the eastern end of the Zoological Park; which is not yet constructed and Porcupines are housed in the enclosure prepared for Pangolin which is also of 200sqm as per approved Master (Layout) Plan. In the existing Master (Layout) Plan pangolin enclosure will be modified for Porcupine and a new Pangolin enclosure will be made at the eastern end of the Park premises.

xii. Primates Enclosures

Two enclosures 600sqm each are constructed to house Rhesus Macaque and Common Langur opposite to reptile house at the southern side of the zoological park. However, at present Assamese Macaque and Bonnet Macacae are housed there instead of Rhesus Macaque and Common Langurs.

The rescued Rhesus Macaque and Common Langurs are housed in off display Rescue centre constructed extreme south of the Zoological Park.

Porcupines are housed in small enclosures and will be shifted to new enclosures after their construction.

xiii. Deer and Nilgai Enclosure

There are three deer enclosures (Spotted Deer – 0.81ha, Barking deer - 0.8ha, Sambar – 0.98ha) and one Nilgai enclosure (0.45ha). These enclosures are made of chain link fencing with one-night Shelter and one feeding cubical. There is a natural water body inside the Sambar deer enclosure spanning 0.94ha, which is the source of water for animals. The present population of spotted deer is 113, of Sambar deer is 5, of Barking deer is 13, of Nilgai is 21.it will further increase because of natural breeding, and hence, the excess animals should be regularly shifted to other zoos or natural habitat to keep the number of animals within limit.

Reptile Section

xiv. Snake House:

Snakes are housed in enclosure of 200sqm area opposite to barking deer enclosure.

At present snake house is not open for displaying instead a new Snake House and Constrictore House are under construction as per CZA guidelines which will house different species of local snakes, Python and Anaconda.

xv. Turtle Pond/ Enclosure:

There are three numbers of temporary turtle pond exist opposite Sambar deer enclosure to house Indian Soft Shell Turtle, Black Pond Turtle and Tricarinate hill turtle in the Junglemahal Zoological Park.

xvi. Tortoise Enclosure:

Indian Star Tortoises are kept in a temporary enclosure made near eastern side of the park, opposite sambar deer enclosure.

xvii. Monitor Lizard Enclosure:

Bengal Monitor Lizards is housed in a enclosure beside Sambar deer enclosure at the eastern side of the Park.

Aviary Section

xviii. Flying Bird Aviary (Native):

The total area of the enclosure is 600 sqm built in between Sambar Deer and Spotted Deer Enclosure at the northern side of the park. At present, parakeets and pea fowls are housed there. They will be relocated once species specific enclosures will be made.

xix. Flying Bird Aviary (Non Native):

One enclosure of 600sqm is constructed to house Blue and Yellow Macaw opposite reptile house in between Pangolin and Rhesus Monkey Enclosures.

xx. Raptor Enclosure:

One enclosure of 600sqm was built to house Hawk and Vulture besides Non Native Flying Bird Aviary.

xxi. Pheasantry:

There are four Pheasantry located at the Northern side of the Park besides NIC building after entrance gate. Presently these enclosures of the Park houses Red Jungle Fowl and Khalij pheasant together within an area of 80sqm, Golden Pheasant (80sqm)and Silver Pheasant (80sqm), Lady Amherst Pheasant (80sqm.) and Indian Peafowl (120sqm). One more pheasantry will be added in future plan.

xxii. Emu Enclosure:

In between Leopard and Bengal Fox Enclosure a temporary enclosure exist for housing Emu in the Zoological Park.

2.2 Veterinary Section

Staff engaged: Veterinary Assistant-Nil

Veterinary Hospital is constructed with a lab, dispensary, two OPDs.

Doctor's chamber, O.T., Autoclave, Incubator facilities, medicine storage facility, refrigerators are available within Hospital. In addition, Park also has a postmortem room. Two quarantine Centres, one for herbivores and other for carnivores is existing within Zoological Park. One rescue centre for Primates is also there in the park.

No permanent veterinary Doctor is available for zoological Park. Local vets conduct weekly inspection of captive animals. The services of Govt. Veterinary Doctors are requisitioned at the time of need from the nearest veterinary hospital at Jhargram. One Veterinary Assistant was recruited there on contract basis but he quit job and new recruitment is pending.

Staff assisting this section:

Zoo Keeper, Animal Attendant, Attendant and other supporting staff are assisting this section under the supervision of the Zoo Supervisor, as and when required.

Constraints:

A full time veterinary officer required to be posted in the Zoo. Veterinary assistant and an attendant will require according to the development of the zoo.

Improvements of veterinary facilities are required like indoor patient ward, sophisticated surgical equipment, medical research and documentation. Power back-up system and proper sanitary plumbing work required in the Hospital of the Zoological Park.

2.3 Maintenance Section

Staff engaged: 0

Constraints:

There is no separate maintenance section in Junglemahal Zoological Park. The activities are performed by local skilled persons under supervision of Zoo Supervisor on contract or on daily wages. Separate maintenance section needs to be developed in the zoo for taking up regular maintenance work.

2.4 Garden Section

Staff engaged: 2

For aesthetic purpose, grasses and seasonal plants are planted. However, the natural Vegetations are retained inside the Zoo premises.

Constraints:

Proper landscaping and planning of appropriate plant species is to be made to provide a naturalistic environment within the Zoological Park to enable the visitors to have communication with nature and get motivated for living in harmony with nature. Require Garden supervisor and maintenance staff. Network of water pipeline and sprinkler needs to be installed according to the plan in the Zoological Park for gardening.

2.5 Security Section

Staff engaged: 9

Security is one of the most important aspects of Zoo management. Boundary wall of 2m with chain link fencing is exists to stop the entry of infiltration and stray animals all along the zoological park. The security section of the zoo is looked after by security guards and gate keepers under the supervision of the Zoo supervisor. There are 9 security personnel have been appointed on contract basis- for day and night security. 36 nos. of CCTV Cameras have been installed to watch the trespassing in the zoo area.

Constraints

Regular updating of equipments for the security personnel is essential. More security personnel need to be engaged to strengthen the day-night security. Security amenities like walky-talkies are required. Permanent boundary wall to be constructed along the entire perimeter of the Zoo. More CCTV to be installed to watch cover entire perimeter of the zoo and animals enclosures.

2.6 Power Supply Section

Staff engaged: 0

Junglemahal Zoological Park is facilitated with Electric Supply, required lighting arrangement has been provided at strategic points to safeguard the zoo and to keep close watch over the property after sunsets. Power supply is conventional in the Zoological Park from West Bengal State Electricity Board.

Constraints:

Staff required for maintenance of power supply witin zoological park

premises. During natural calamities, the power supply may get hampered for several hours to several days. Inverter for important places required to be installed. It is required to develop a solar power system to support minimum power supply for CCTV, energized fence, office etc.

2.7 Feed and Store Section

Staff engaged: 2 nos. of animal keepers engaged on daily wages

Present arrangement:

This is the most important section as far as animal diet is concerned. The clean and safe diet goes a long way in maintaining the health and upkeep of animals. However, storing of quality food, preparation and supply of food to all animals requires lot of logistics. There is a kitchen to process food and a store room for storage of food items. For storing perishable food items, the zoo kitchen also contains a refrigerator.

Outside agencies supply the food grains etc. for the animals on monthly basis and for carnivores meat is supplied on daily basis. The quality and specificity of the food is checked by Divisional Forest Officer (DFO) / Veterinary Officer with the assistance of Zoo Supervisor. Fodder available within premises will meet requirement of herbivores during strike/ natural calamity.

Constraints: Alternate supply chain is not well developed and also need to work out an alternative food regime for species specific requirements. There is also lack of availability of high-pressure washing equipment (water jet), crate with lids provided for transportation of food items from stores to different animal enclosures, deep freezer, fly traps etc.

Presently no staff is engaged exclusively for the store & feed supply section of the Zoological Park. The Zoo keepers and animal attendants are carrying out the duties and responsibilities of this section under the supervision of the Zoo supervisor.

2.8 Sanitation Section

Staff engaged: 2

A good zoo is certainly one, which has also made provisions for good sanitation facilities. Regular drainage for regular discharge of effluent is a must. Hygiene of the enclosures and zoo surroundings is ensured throughout, to prevent diseases to the animals. Better sanitation takes care of the health of the animals. Well defined drainage system is provided in animal night shelters. However, there is a scope for improvement in the drainage system. This section is dealt with the sanitary attendant under the supervision of the Zoo Supervisor and other staff.

Constraints: Lack of running water facility with in-sufficient overhead tanks makes the process cumbersome. Furthermore, permanent drains are needed for disposal of liquid waste. Require more sanitary attendant to make zoo clean. Garbages and bio-degradable materials are kept at compost pit while rest is carried to the disposal side outside zoo premises.

2.9 Construction and maintenance section

There is no separate construction & maintenance section in the Zoological Park at present.

Constructions of civil, electrical and mechanical nature are being carried out by inviting open tenders from eligible contractors. Various other maintenance works in the Zoological Park are being performed by local skilled persons on contract or on daily wages under the supervision of Zoo supervisor along with other staff members.

The Executive Engineer and Assistant Engineer of West Bengal Zoo Authority provide necessary assistance to plan the designing of enclosures, preparation of estimates and supervision during execution.

2.10 Water supply section:

Staff engaged: Nil

Water supply is a primary concern of every establishment. Water supply in a zoo can be viewed from 3 angles i.e. water supply to staffs managing zoo, water supply for visitors, water supply to zoo animals. There are three deep tube wells with Over Head Tanks in the Zoological Park. Water is

supplied from these tube wells through network of distribution system to staff quarters, visitors and animal enclosures.

Apart from these, there are 4-5 nos. of water body in Junglemahal Zoological Park, out of which 1 (one) big water body exists in the Sambar Deer enclosure, which is the source of water for them. Another source of water of Junglemahal Zoological Park is a perennial river which flows along the eastern boundary of zoo.

Constraints:

The supply of freshwater is necessity for maintenance of animal and public sanitation facilities.

2.11 Research and Education

Staff engaged: Research Assistant: - 0

At present West Bengal Zoo authority is conducting two research projects entitled 'Screening of *Listeria* sp. from different wild captive animals of different zoos of West Bengal' and 'Bacterial Screening of faecal samples collected from different wild captive animals of different zoos of West Bengal.'

No research programmes are taken up in the zoological park. In future research programme may be undertaken in collaboration with the nearby colleges, if permitted. A NIC is exists in the northern part of the Zoological Garden for public awareness and education programme. Online quiz competition and rally for wildlife conservation used to be conducted by the Zoological Park.

Constraints: Zoo Biologist/ Research Assistant and Zoo Educator need to be recruited to identify issues of study and to conduct systematic, scientific study and to establish network with University and other Institution to carryout collaborative research work on the important issues on a regular basis. Junglemahal Zoological park doesn't have a continuous zoo education program or a set education policy, because there aren't enough staff members working in this area of the zoo.

There is lack of information booklets and materials on animals of Zoo and on conservation aspects.

2.12 Transport Facilities

Staff engaged: 0

Constraints: Except one animal ambulance obtained by CSR sheme, zoological park does not have any transport vehicle. Only two transportation cages are not sufficient to carry animals as per need. There is also a demand of vehicle for transporting essential materials. Battery operated cars for senior citizens and specially challenged visitors are also needed.

2.13 Visitor Facilities

Present arrangement:

Presently all basic visitors' facilities like animal and directional sinages, sitting arrangement, toilets and drinking water points are present in the Zoological park premises. Based on CZA guidelines, the following amenities have been developed for visitors.

- The Zoo has a separate entry and exit gate and a ticket counter.
- There is well planned visitors circulation path.
- Appropriate sinages for directing visitors in the trail and showing the way to various enclosures are in place.
- Three (3 no.) toilet have been constructed for public convenience.
- Two (3no.) water point have been developed.
- Two visitors rest shed with sitting arrangement have been created.
- Warning signboards have been developed to discourage the visitors from feeding or teasing animals.
- Wheelchairs for old and 'divyang' visitors are available.
- First aid facilities are available in case of any emergencies.
- Sufficient parking space has been earmarked for parking of vehicles outside the main gate.
- One cafeteria is there at the northern side of the Zoological Park was constructed.

Constraints:

The Zoological Park does not have Cloak Room and Child care unit for

visitors. Require more signage for directing visitors in the trail and showing the way to different enclosures. Furthermore, the existing drinking water supply facilities are not adequate. More Rest shed and facilities for physically challenged people need to be established.

2.14 Disposal of Solid and Liquid Waste

Staff engaged: 0

The solid waste generated in the zoo is predominantly organic in nature and composed of grass, leaf litters, leftover food items and animal excreta. These are taken to the compost pit near nursery. As food items and plastic are strictly restricted for the visitors, generation of non-biodegradable wastes is less; and if generated, the collected non-biodegradable items are transported to the chamber at the north-eastern side of the zoo.

Constraints

No specific management plan has been developed for liquid waste. Waste treatment plant required to be constructed for the waste generated within Zoological Park.

2.15 Zoo Administration Section

General Zoo Administration Section:

The Divisional Forest Officer, Jhargram Forest Division is the Ex-Officio Director, of the Junglemahal Zoological Park. The Director is looking after all the administration of the zoological park and he is assisted by Assistant Director, Forest Range Officer and 22 nos. of contractual zoo staff.

Contraints:

Administrative Office is present at the Zoo.

Entry gate & Ticket Counter

The entry gate and ticket counter are at the northern side of the zoo adjacent to the main road for selling of entry ticket to the visitors.

Staff engaged:

Ticket Attendant / Clerk**:** One
Gate Keeper: One

The present organizational structure is as follows:-

2.16 Animal Collection Plan

The Junglemahal Zoological Park's current animal collection strategy was created with the intention of protecting the endangered native species. However, the plan is not yet approved by Central Zoo Authority.

TABLE : II

Existing Animal Collection Plan

Sl. No	**Species**	**Existing Stock**				**Proposed Collection**				**Animals to be acquired**				**Area Proposed**
	Mammals	**M**	**F**	**U**	**Total**	**M**	**F**	**U**	**Total**	**M**	**F**	**U**	**Total**	
1	Tiger *(Panthera tigris)*	-	-	-	-	2	2	-	4	2	2	-	4	3000 Sq.mtrs.
2	Leopard *(Panthera pardus*)	1	-	-	1	2	2	-	4	1	2	-	3	1000 Sq.mtrs.
3	Sloth Bear *(Melursus urnicus*)	-	3	-	3	2	3	-	5	2	-	-	2	1000 Sq.mtrs.
4	Jungle Cat *(Felis chaus)*	5	1	-	6	2	4	-	6	-	3	-	3	400 sq.mtrs.
5	Fishing Cat *(Prionailurus viverrinus)*	1	-	-	1	2	4	-	6	1	4	-	5	400 sq.mtrs.
6	Leopard Cat *(Prionailurus bengalensis)*	-	-	-	-	2	4	-	6	2	4	-	6	400 sq.mtrs.

7	Common Palm Civet *(Paradoxurushermaphroldit-us)*	1	-	-	1	2	3	-	5	1	3	-	4	400 sq.mtrs.
8	Large Indian Civet (Viverrazibetha)	-	-	-	-	2	2	-	4	2	2	-	4	400 sq.mtrs.
9	Stripped Hyena *(Hyaenahyaena)*	1	2	-	3	2	3	-	5	1	1	-	2	800 sq.mtrs.
10	Indian Wolf *(Canis lupus)*	4	6	-	10	2	3	-	5	0	-	-	0	800 sq.mtrs.
11	Bengal Fox (Vulpes benglensis)	1	-	-	-	2	4	-	6	1	4	-	5	400 sq.mtrs.
12	Jackal *(Canisaureus)*	-	-	-	-	2	4	-	6	2	4	-	6	550 sq.mtrs.
13	Spotted Deer *(Axis axis)*	20	51	42	113	4	20	-	24	-	-	-	0	8100 Sq.mtrs.
14	Barking Deer *(Muntiacusmuntijak*)	7	6	-	13	2	4	-	6	-	-	-	0	8000 sq.mtrs.
15	Sambar *(Cenvus unicolor))*	3	2	-	5	5	5	-	10	2	3	-	5	9800 Sq.mtrs.
16	Rhesus Macaque *(Macacamulata)*	4	3	-	7	2	4	-	6	-	-	-	0	600 sq.mtrs.
17	Common Langour *(Semnopithec*	1	1	-	2	2	4	-	6	1	3	-	4	600 sq.mtrs.

	us entellus)													
18	Indian Pangolin *(Manis*crassica udata)	-	-	-	-	2	4	-	6	2	4	-	6	200 sq.mtrs.
19	Porcupine *(Hystrix indica)*	-	-	3	3	2	4	-	6	2	4	-	6	200 sq.mtrs.
20	Elephant (*Elephas*maxi mas)	1	-	-	-	1	2	-	3	-	2	-	2	5000 sq.mtrs.
21	Nilgai (Blue Bul)	7	14	-	21	2	6	-	8	-	-	-	0	4500 sq.mtrs.
22	Bonnet Macaque	2	-	-	2	2	3	-	5	-	3	-	3	600 sqmt
Birds														
23	Indian Peacock *(Pavocristatus)*	4	1	-	5	2	4	-	6	-	3	-	3	160 sq.mtrs.
24	Red Jungle Fowl *(Golus -golus)*	-	1	-	1	2	6	-	8	2	5	-	7	80 sq.mtrs
25	Silver Pheasant	-	-	-	-	1	2	-	3	1	2	-	3	80 sq.mtrs.
26	Khalij Pheasant	1	1	-	2	2	2	-	4	1	1	-	2	80 sqmt
27	Golden Pheasant *(Chrysoiophuspi ctus)*	-	-	-	-	1	2	-	3	1	2	-	3	80 sq.mtrs.
28	Local indegeneous Birds				4	25	35	-	60	23	33	-	56	
	Flying Birds Aviary													

														600 sq.mtrs.
29	Red Breasted Parakeet *(Psittaculaalexandri)*	-	-	6	6	2	5	-	7	2	-	-	2	
30	Rose Ringed Parakeet *(Psittaculakramori)*	-	-	10	10	3	7	-	10	3	-	-	3	
31	Alexandrine Parakeet *(Psittaculaeupatria)*	-	-	7	7	3	4	-	7	-	-	-	-	
32	Parakeet Exotic	-	-	1	1	3	3	-	6	2	3	-	5	
33	Spotted Munia (Lonchura*punctulata)*	-	-	2	2	1	3	-	4	1	3	-	4	
34	Black Headed Munia (Lonchura Malacca)	-	-	2	2	5	5	-	10	1	2	-	3	
35	Emu	-	-	7	7	5	5	-	10	3	2	-	5	
36	Raptors (Hawk, Eagle etc)	-	1	1	2	3	3	-	6	3	2	-	5	
37	Other Birds				18				25				7	
	Water Bird Aviary													9400 sq.mtrs.
38	Painted Stork *(Mycterialeucocephala)*	-	-	-	-	2	4	-	6	2	4	-	6	
39	OpanbillStork*(*	-	-	-	-	2	4		6	2	4	-	6	

	Anastom-usnoscitans)							-						
40	Lessor Adjustent Stork *(Leptoptilos*javanicus*)*	-	-	1	1	4	4	-	8	4	4	-	8	
41	White Ibis *(Threskiornisacthropica)*	-	-	-	-	4	4	-	8	4	4	-	8	
42	Lessor Whistling Teal *(Dendrocygnajavanica)*	-	-	-	-	2	6	-	8	2	6	-	8	
43	Common Teal *(Anascrecca)*	-	-	-	-	2	6	-	8	2	4	-	8	
44	Rocy or white Pelicon*(Peleconusonocrotalus)*	-	-	-	-	2	4	-	6	2	4	-	6	
Reptiles & Amphibians														
45	Crocodile *(Crocodilus palustris)*	-	-	-	-	1	2	-	3	1	2	-	3	2600 sq.mtrs. pond
46	Spotted Pond Turtle *(Gcoclemyshamilfonii)*	-	-	34	34	5	25	-	30	4	-	-	4	3200 sq.mtrs. pond
47	Indian Soft Shell Turtle *(Nilssonia gangeticus)*	-	-	2	2	1	2	-	3	1	-	-	1	
48	Tricarinate hill turtle (*Melanochelys tricarinata*)	-	-	30	30	5	20		25		5		5	

49	Indian star tortoise (Geochelone elegans)			64	64	10	20		30			34	34	
Reptile House														
50	Indian Python *(Python molurus)*	-	-	1	1	2	5	-	7	2	5	-	7	160 sq.mtrs
51	Spectacled Cobras *(Naja naja)*	-	-	4	4	1	3	-	4	1	-	-	1	45 sq.mtrs.
52	Monocellate Cobra *(Naja kaouthia)*	-	-	2	2	2	4	-	6	2	4	-	6	45 sq.mtrs.
53	Russell's Viper (*Daboia russelii*)	-	-	2	2	1	3	-	4	1	3	-	4	40 sq.mtrs.

M: Male
F: Female
U: Unknown Sex

2.17 Research

Zoos and aquariums have a long history of conducting research that has aided in the advancement of fundamental scientific knowledge and facilitated the ability of institutions to make knowledgeable judgments regarding the management of their animal populations.

A well-validated body of information based on widely acknowledged principles is the result of good research and is suited for dissemination. The zoo's employees, as well as students, qualified volunteers, or outside research partners, may carry out the research work. Overall, the health and wellbeing of particular wild animals or groups, as well as the protection of

wild species and ecosystems, are the most significant parts of the knowledge gained from zoo research. Actions that significantly improve the survival of species and ecosystems are referred to as "conservation," whether they are taken in the natural environment (in situ) or away from it (ex situ). Results from research are especially helpful for problem identification, characterization, and resolution as well as for setting priorities and making decisions for conservation, animal welfare, or other goals including education and public relations. Zoo research can contribute significantly to the advancement of science on a number of areas and be applicable in a wide range of settings, including the field of wildlife management. The possibilities for zoo research are essentially limitless and include non-invasive, benign studies involving concepts from engineering and mathematics, such as biomechanical or biomaterials studies of flight (aerodynamics), navigation, and migration in bats, birds, and insects; or of swimming (hydrodynamics) in mammals, reptiles, frogs, fish, and invertebrates. Zoo-based research does not always have to be directly and obviously "practical" or motivated by pre-existing hypotheses. The Strategy emphasizes the significant long-term importance of speculative, 'blue-sky' research in zoos and aquariums.

Animal care, assisted reproduction, behaviour, bioinformatics, biomaterials or "gene" banking, biotechnology, contraception, database management, diet, disease, DNA analysis, domestication, environmental enrichment, husbandry, identification, life histories, low temperature biology (cryobiology), parasites, population analysis, reproduction, and stud management are just a few of the topics that basic and applied research programs in zoos or aquariums can cover.

2.18 Conservation breeding

The Conservation Breeding Program is a science that aims to conserve a species by preventing the approaching natural population collapse driven by numerous elimination pressures (such as habitat loss, habitat fragmentation, industrialization, poaching, illegal trade, and climate change, among others). The Conservation Breeding Program's objective is to preserve the genetic diversity of the species and restore it to the wild to build a self-sustaining population. Zoo animals are kept as insurance for use in the future with the only purpose of enhancing and supplementing the existing population, or they should only be utilized for restocking/reintroduction if the species becomes extinct in the wild. Zoos should manage these populations so that each individual can be utilized for display and that there is a surplus stock available in case extinction occurs or the in-situ population needs to be boosted. These people are also utilized as teaching resources to raise awareness of the need to conserve these endangered animals.

Sequence of actions must be taken for conservation breeding in accordance with CZA guidelines:

1. Recognition of the founders.
2. Marking of founders with rings, ear tags, or transponders.
3. Creation of animal observation and history sheets for the founders that have been identified.
4. The National Studbook Keeper compiles the Studbook.
5. Communication with the species' (if any) International Studbook Keeper.
6. The ability to purchase the founders from foreign zoos (if necessary), as well as information about the zoos where founders may be purchased.
7. The founders' physical condition was examined at the National Referral Centre (Indian Veterinary Research Institute, Bareilly) and the zoo's veterinary hospital.
8. The founders' genetic health will be examined using blood samples or other body parts with assistance from LaCONES, Hyderabad.

2.19 Education and Awareness

The Junglemahal Zoological Park was established primarily to entertain visitors while also educating them about animals. This Zoo is frequently visited by many students from various schools, colleges, and universities for educational purposes. Additionally, DFO/ADFO/Range Officers participated in the study trips to provide information on a variety of topics related to wild animals, their habitats, and the need for conservation. The detrimental impacts of the overuse of natural resources are also discussed, along with how adopting sustainable lifestyles and living in harmony with the environment will preserve life on Earth.

Zoos are an effective tool for educating people about the close relationship that exists between protecting natural areas and maintaining the life-sustaining processes of nature since they are frequently visited by huge numbers of people.

The Zoo management applies the following approaches towards education of visitors & public in general:

- The management of the zoo uses the following strategies to educate visitors and the general public:
- Signages that are properly created to highlight the biological and ecological details of the species on display, as well as their number in the wild and conservation status.
- Informative & conscientious Warnings that highlight the importance of protecting forests and wildlife, wetland ecosystem conservation, the role of zoos in wildlife conservation, criminal laws against hunting and wildlife trafficking, myths about wildlife products, etc. are all important issues that require everyone's attention if we are to find solutions.

- Guided tours of nearby school students are organized from time to time by the Zoo.
- **Nature Interpretation Centre:-**
  A NIC is exist in the northern part of the Junglemahal Zoological Park for public awareness and education programme.

Chapter III:
FUTURE OBJECTIVES, VISION, MISSION, THEME & STRATEGY

3.1 Future Objectives

In earlier days, the zoo was mainly established for the purpose of entertainment. But the concept of zoo has drastically changed. Now a day's more stress has been given on conservation, education and research than entertainment. This has been made clear in the National Zoo Policy, 1998. Keeping this in view the objectives, theme and mission of the Junglemahal Zoological Park have been framed as follows:-

A. Conservation Breeding: Breeding and increase of endangered wildlife species of India and around the world with the goal of preventing them from extinction through restocking other zoos and eventually enhancing the declining natural fauna.

B. Conservation Education: To promote conservation education, community attitude development, capacity building, and increased community awareness.

C. Animal Housing: To assure the housing of captive animals and birds with a focus on excellent animal husbandry, health care, and ethical standards. Rescue and rehabilitation of the wild animals of Junglemahal area.

D. Awareness: To promote wildlife conservation by igniting public interest and concern for wildlife through the organization of exhibitions and seminars.

E. Conservation Research: To promote scientific investigation into animal behaviour, environmental enrichment, disease control, nutrition, and reproductive biology.

3.2 Vision

This zoological Park plans to develop a system for improving knowledge of the proper maintenance and ex-situ conservation of the globally vulnerable fauna and flora, as well as regional biodiversity and community ex-situ

conservation sensitization. The zoological Park will serve as a location of research on animal behaviour, oversee conservation efforts, and create species-specific conservation and management plans. As a facility for endemic species recovery, the zoo will seek to conserve breeding of endemic species and preserve insurance populations.

3.3 Mission Statement

- Communicating the message of conservation education through effusive and learning experiences without compromising the probable standards of display of wild animals common to Junglemahal area under the existing policies and rules.
- To connect visitors and animals through best available animal welfare and care, best educational and inspirational experiences, fostering public appreciation and support for wild animals and conservation.

3.4 Theme

The theme of the zoo is to display the animals found in the locality particularly in Junglemahal area in wild conditions. The visitors are to be apprised regarding their natural habitats and their conservation values and to facilitate the visitors to understand biology, ecology and behavior of animals in display.

3.5 Strategies

The strategies to achieve the goals will be through housing and display of broad representatives of diverse and endangered animals and birds with emphasis on the Indian fauna belonging to this region and adaptive to the geo-climatic conditions. These are:-

a) Promoting good husbandry practices that safeguard the physical and mental health of the animals in our care through experts of animal and veterinary care and a through animal management strategy.
b) Education, including enlisting the help of and educating staff members, carrying out in-reach and outreach programs, holding conferences and workshops for volunteers and others, and displaying natural animal displays as well as directional, informative, and interpretive signage.

c) The representation of wild animals and their habitats in animal exhibits, landscaping, graphics, and Zoo programming must foster visitor understanding and concern.
d) Allocating funds to conservation breeding initiatives that will help preserve particular species.
e) By utilizing personnel, universities, and other zoological organizations, supporting and taking part in scientific research that advances our knowledge of, and understanding of, endangered animals.
f) Providing a positive visitor experience through contemporary exhibit design, efficiently run visitor services (such as restrooms, gift shops, rest areas, cloak rooms, wheelchair parking, etc.), and formal and scientific landscaping to make the most of the natural and park-like surroundings.

Junglemahal zoological Park will try to be self-sustaining and financially stable through innovative marketing techniques and increasing tourist foot traffic.

g) Raising funds to augment the operation of the zoological Park. Enhancing public amenities and infrastructure (such as well-maintained exhibitions and visitor pathways, restrooms, visitor sheds, and drinking water facilities, etc.) would significantly contribute to boosting image of the Zoo.

The following possibilities would be explored besides the revenue generated from entry tickets:

- Appropriate organization advertising in the zoological Park.
- Building food courts, cafeterias, and gift shops inside the zoological Park.
- Transportation rides, photography, and videography.
- Adoption of exhibitions, including feeding of animals, upkeep of cages, and medical attention, etc.
- Website of the zoological Park: The zoological Park has to be developed a website with up-to-date information, including the grievances resolution mechanism, in order to provide needed information to the tourists and other agencies.
- Friends of Zoo- possible Donors: The administration of the zoological Park would invite possible donor groups and/or individuals to the park's activities and functions in order to

identify them. In order to foster empathy for the zoological Park animals, organizations who have demonstrated a strong interest in donating funds for social and public causes can be introduced to the facility.

- Networking with other industries: zoological Parks that house charismatic and endangered species struggle to attract more tourists while amusement parks, museums, and outdoor adventure activities draw crowds. In order to inform their customers about the experiences the Zoo has to offer, the zoological Park management will network with tour companies, transportation companies, hotels, movie theaters, and shopping centers.

The objectives as mentioned above are to be achieved by housing and displaying of broad representatives of diverse and endangered animals and birds belonging to this region considering the climatic condition suitable to them. The animals are displayed in pleasant aesthetic natural settings in conformity with their almost natural habitat and their biological needs, to ensure standard animal health & hygiene and expert veterinary care, by providing sufficient space to the animals as per CZA guide lines.

Chapter IV
FUTURE ACTION PLAN

The future action plan is aimed to provide direction for development of the zoological Park in coming 20 years i.e. 2024-25 to 2044-45. The proposal is based on the topography of the site, water availability, vegetation, climate, visitors profile, conservation, education and research need and convenience of management. For convenience, the proposal has been prepared section wise. The recommendations of the Central Zoo Authority during the evaluation of the zoos from time to time has also been kept in view while formulating the proposal for new structures or modification of existing structures.

4.1 Animal Collection Plan

Conservation being the main objective of the zoo management, the following goals is visualized to achieve the stated objectives.

1. Ex-Situ conservation of threatened species, especially those that are endemic to the geographical region.
2. Using a thematic exhibition of wild animals to provide a strong conservation message to visitors about the world's endangered species and conservation strategies.
3. Display of charismatic wild animals that are popular with visitors and have the ability to become the center of attention, increasing zoo visitors.
4. Achieving a genetic population of all shown species that is self-sustaining.
5. Protecting the sick, injured, and orphaned animals that were brought to the zoo.

The first three objectives must be set with proper consideration for the zoo's historical breeding and maintenance performance of the species, suitability of the local climate for long term survival of the species, availability of space and infrastructure for housing, upkeep and health care of the species under naturalistic settings as per rules and guidelines of the Central Zoo Authority.

Display theme

The zoo grew up haphazardly without any planning and at this point of time for the convenience of the zoo management, "broad taxonomic display" of animal sps. proposed to be adopted as far as feasible and the said display will be as follows:

Class: Mammal

Carnivores:
Order: Carnivores

S. order: Feliform
Large carnivores safari (Tiger)
Big Cat Exhibit (Bengal Tiger, Asiatic Lion, Common Leopard, Striped Hyena)
Lesser cat exhibits (Fishing Cat, Jungle cat, Leopard cat)

S. order: Caniform

Indian Grey wolf,

Bengal Fox,

Golden Jackel,

Wild Dog

Sloth Bear

Small clawed otter

Order: Pholidota

Suborder: Eupholidota

Pangolin

Herbivores

Order: Artiodactyla

Mixed Deer Exhibit (Spotted Deer, Sambar deer, Barking Deer,)

Mixed Antelope Exhibit

Non Native Herbivores Exhibit (Hippopotamus)

Class: Aves

Bird aviaries
Pheasantries
Water Bird aviary
Walk-in Aviary
Flying Bird Aviaries (Non-native species)
Flying Bird Aviaries (Native species)

Class: Reptiles

Marsh Crocodile
Gharial
Snakes,
Monitor Lizards
Tortiose

Proposed Animal collection Plan

Keeping in view of the theme of the Junglemahal zoological Park, Jhargram in the collection plan, main thrust would be given on animal sps. of Junglemahal area especially.

TABLE : III

Sl.No	Species	Existing Stock				Proposed Collection				Animals to be acquired/ disposed				Remarks
	Mammals	M	F	U	Total	M	F	U	Total	M	F	U	Total	
1	Tiger *(Panthera tigris)*	**0**	**0**	**0**	**0**	4	4	**0**	8	4	4	**0**	8	8 to be acquired from recognized zoo
2	Asiatic Lion *(Panthera leo)*	**0**	**0**	**0**	**0**	2	2	**0**	4	2	2	**0**	4	4 to be acquired from recognized zoo
3	Leopard *(Panthera pardus*)	1	**2**	**0**	3	2	2	**0**	4	1	0	**0**	1	1 to be acquired from recognized zoo

4	Sloth Bear *(Melursus urnicus*)	**0**	2	**0**	2	2	2	**0**	4	2	**0**	**0**	2	2 to be acquired from recognized zoo
5	Jungle Cat *(Felis chaus)*	4	1	**0**	5	4	4	**0**	8	**0**	3	**0**	3	3 to be acquired from recognized zoo
6	Fishing Cat *(Prionailurusviverrinus)*	3	**3**	**0**	6	4	4	**0**	8	1	1	**0**	2	2 to be acquired from recognized zoo
7	Leopard Cat *(Prionailurus bengalensis)*	**0**	**0**	**0**	**0**	3	3	**0**	6	3	3	**0**	6	6 to be acquired from recognized zoo
8	Stripped Hyena *(Hyaenahyaena)*	2	1	**0**	3	3	3	**0**	6	1	2	**0**	3	3 to be acquired from recognized zoo
9	Indian Grey Wolf *(Canis lupus)*	1	4	**0**	5	3	3	**0**	6	2	**-1**	**0**	2	2 male will be acquired & 1 female disposed
10	Bengal Fox (*Vulpes bengalensis*)	0	**0**	**0**	**0**	3	3	**0**	6	3	3	**0**	6	6 to be acquired from recognized zoo
11	Golden Jackal *(Canis aureus)*	0	**0**	**0**	**0**	3	3	**0**	6	3	3	**0**	6	6 to be acquired from recognized zoo
12	Spotted Deer *(Axis axis)*	46	47	0	93	10	14	**0**	24	**-36**	**-33**	**0**	-69	69 deer will be disposed
13	Barking Deer *(Muntiacus muntijak*)	10	18	**0**	28	4	4	**0**	8	**-6**	**-14**	**0**	-20	20 deer will be disposed
14	Sambar *(Cenvus unicolor)*	4	0	**0**	4	4	4	**0**	8	0	4	**0**	4	4 Sambar to be acquired
15	Hog Deer *(Axis porcinus)*	0	0	0	0	4	4	0	8	4	4	0	8	8 to be acquired from recognized zoo
16	Blackbuck *(Antilope cervicapra)*	0	0	0	0	4	4	0	8	4	4	0	8	8 to be acquired from recognized zoo
17	White black Buck (*Antilope cervicapra*)	0	0	0	0	4	4	0	8	4	4	0	8	8 to be acquired from recognized zoo
18	Four Horned Antelope *(Tetracerus quadricornis)*	0	0	0	0	4	4	0	8	4	4	0	8	8 to be acquired from recognized zoo
19	Nilgai *(Boselaphus tragocamelus)*	11	15	0	26	4	4	0	8	-7	-11	0	-18	18 to be disposed off
20	Chinkara *(Gazella bennettii)*	0	0	0	0	4	4	0	8	4	4	0	8	8 to be acquired from recognized zoo

21	Indian Pangolin *(Manis crassicaudata)*	**0**	**0**	**0**	**0**	2	4	**0**	6	2	4	**0**	6	6 to be acquired from recognized zoo
22	Porcupine *(Hystrix indica)*	**0**	**0**	3	3	2	4	**0**	6	2	4	**0**	6	6 to be acquired from recognized zoo
23	Small Clawed Otter *(Amblonyx cinereus)*	0	0	0	0	2	4	**0**	6	2	4	**0**	6	6 to be acquired from recognized zoo
Aves														
Flightless Birds														
24	Emu (*Dromaius nova chollandiac*)	3	2	0	5	3	2	0	5	0	0	0	0	---
25	Cassowary (*Casuarius casuarius*)	**0**	**0**	**0**	**0**	2	2	**0**	4	2	2	**0**	4	4 to be acquired from recognized zoo
Pheasant														
26	Indian Peafowl *(Pavo cristatus)*	4	5	0	9	10	10	0	20	6	5	0	11	11 to be acquired from recognized zoo/ captive breeding
27	Red Jungle Fowl *(Galus galus)*	5	8	0	13	10	10	0	20	5	2	0	7	7 to be acquired from recognized zoo/ captive breeding
28	Grey Jungle fowl *(Gallus sonnerati)*	0	0	0	0	5	5	0	10	5	5	0	10	10 to be acquired from recognized zoo
29	Silver Pheasant (*Lophura nycthemera*)	1	3	0	4	5	5	0	10	4	2	0	6	6 to be acquired from recognized zoo/ captive breeding
30	Khalij Pheasant (*Lophura leucomelanos*)	1	2	0	3	5	5	0	10	4	3	0	7	7 to be acquired from recognized zoo/ captive breeding
31	Golden Pheasant (*Chrysolophus pictus*)	3	2	0	6	5	5	0	10	2	3	0	5	5 to be acquired from recognized zoo/ captive breeding
32	Lady Amherst's Pheasant (*Chrysolophus amherstiae*)	0	1	0	1	5	5	0	10	5	4	0	9	9 to be acquired from recognized zoo
33	Black Patridge, *(Melanoperdix niger)*	0	0	0	0	5	5	0	10	5	5	0	10	10 to be acquired from recognized

														zoo
	Flying Birds (Native)													
34	Oriental white backed/Gyps Vulture, *Gyps bengalensis*	0	0	1	1	5	5	0	10	5	5	-1	10	10(5:5:0) to be acquired and 1 Unsexed to be disposed
35	Hawk , *Buteo jamaicensis*	0	1	1	2	5	5	0	10	5	4	-1	9	9 (5:4:0) to be acquired and 1 Unsexed to be disposed
36	Common Babbler (*Purdoides caudate*)	0	0	0	0	5	5	0	10	5	5	0	10	10 to be acquired from recognized zoo
37	Hill Mayna *(Gracula religiosa)*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
38	Common Myna *(Acridotheres tristis)*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
39	Jungle Myna *(Acridotheres fuscus)*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
40	White-rumped Munia *(Lonchura striata)*	0	0	0	0	2	3	0	5	2	3	0	5	To be acquired from recognized zoo
41	Blue-throated Barbet *(Megalaima asiatica)*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
42	Asian Pied Starling *(Gracupica contra)*	0	0	0	0	5	5	0	10	5	5	0	10	To be acquired from recognized zoo
43	Brahminy Starling (*Sturnia pagodarum*)	0	0	0	0	5	5	0	10	5	5	0	10	To be acquired from recognized zoo
44	Asian Pied Starling (*Gracupica contra*)	0	0	0	0	5	5	0	10	5	5	0	10	To be acquired from recognized zoo
45	scaly-breasted munia or spotted munia *(Lonchura punctulata)*	0	0	1	1	5	5	0	10	5	5	-1	10	10 To be acquired from recognized zoo and 1 Unsexed to be disposed
46	Tri-colour Munia Munia *(Lonchura Malacca)*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo

47	Black-headed/ Chestnut munia (*Lonchura articapilla*)	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
48	Red Avadavat (*Amandavaaman dava*)	0	0	0	0	5	5	0	10	5	5	0	10	To be acquired from recognized zoo
49	Red-whiskered Bulbul (*Pycnonotus jocosus*)	0	0	0	0	5	5	0	10	5	5	0	10	To be acquired from recognized zoo
50	Red-vented Bulbul (*Pycnonotus cafer*)	0	0	0	0	5	5	0	10	5	5	0	10	To be acquired from recognized zoo
51	Tailor Bird (*Orthotomus sp.*)	0	0	0	0	5	5	0	10	5	5	0	10	To be acquired from recognized zoo
52	Purple Sunbird (*Cinnyris asiaticus*)	0	0	0	0	5	5	0	10	5	5	0	10	To be acquired from recognized zoo
53	Red brested parakeet (*Psittacula alexandri*)	0	0	4	4	5	5	0	10	5	5	-4	10	10 to be acquired from recognized zoo and 4 unsexed to be disposed
54	Alexandrine Parakeet, (*Psittacula eupatria)*	0	0	1	1	5	5	0	10	5	5	-1	10	10 to be acquired from recognized zoo and 1 Unsexed to be disposed
55	Rose-ringed Parakeet, (*Psittacula krameri)*	0	0	6	6	5	5	0	10	5	5	-6	10	10 to be acquired from recognized zoo and 6Unsexed to be disposed
56	Indian Pied Myna (*Gracupica contra*)	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
57	Oriental Magpie robin (*Copsychus saularis)*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
58	Black headed oriole (*oriolus xanthormus*)	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
59	Asian Green Bee eater (*Meropos orientalis*)	0	0	0	0	6	6	0	12	6	6	0	12	To be acquired from recognized

														zoo
60	Diamond Dove *Geopelia cuneata*	0	0	0	0	4	4	0	8	4	4	0	8	To be acquired from recognized zoo
61	Green Imperial Pigeon (*Ducula aenea*)	0	0	0	0	4	4	0	8	4	4	0	8	To be acquired from recognized zoo
62	Yellow-footed Green Pigeon (*Treron phoenicopterus*)	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
Flying Birds (Non Native)														
63	Red & Green Macaw *(Ara chloropterus)*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
64	Amazon Parrot *(Amazona sp.)*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
65	Grey Parrot *(Psittacus erithacus)*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
66	Eclectus Parrot *(Eclectus roratus)*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
67	Scarlet Macaw *(Ara macao)*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
68	Greater Sulphur Crested Cockatoo (*Cacatua galerita*)	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
69	Lesser Sulphur Crested Cockatoo (*Cacatua sulphurea*)	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
70	Umbrella Cockatoo (*Cacatua alba*)	0	0	0	0	3	3	0	6	3	3	0	6	To be acquired from recognized zoo
71	Blue & Yellow Macaw *(Ara ararauna)*	2	2	0	4	3	3	0	6	1	1	0	2	2 to be acquired from recognized zoo
72	Cockatiel (*Nymphicus hollandicus)*	0	0	15	15	15	15	0	30	+15	+15	-15	30	30 (15:15) to be acquired and 15 unsexed to be disposed
73	Red Lory	0	0	0	0	4	4	0	8	4	4	0	8	To be acquired

	(*Eos bornea*)													from recognized zoo
74	Victoria Crowned Pigeon (*Goura cristata*)	0	0	0	0	4	4	0	8	4	4	0	8	To be acquired from recognized zoo
75	Red-breasted Toucan (*Ramphastos dicolorus*)	0	0	0	0	4	4	0	8	4	4	0	8	To be acquired from recognized zoo
76	Helmeted Curassow (*Pauxi pauxi*)	0	0	0	0	4	4	0	8	4	4	0	8	To be acquired from recognized zoo
77	Black Cockatoo (*Calyptorhynchus banksii*)	0	0	0	0	4	4	0	8	4	4	0	8	To be acquired from recognized zoo
	Water Bird Aviary													
78	White Breasted Water Hen (*Amaurornis phoenicurus*)	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
79	Common Crane (*Grus grus*)	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
80	Sarus crane *(Antigone antigone)*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
81	Indian spot-billed duck *(Anas poecilorhyncha)*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
82	Indian Openbill Stork *(Anastomusn oscitans)*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
83	Painted Stork *(Mycteria leucocephala)*	0	0	0	0	2	3	0	5	2	3	0	5	To be acquired from recognized zoo
84	Spoonbill *(Platelea leucorodia)*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
85	White Ibis *(Threskiornis molucca)*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
86	Little egret *(Egretta*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from

	garzetta)													recognized zoo
87	Pond Heron (*Ardeola sp.*)	0	0	0	0	3	3	0	6	3	3	0	6	To be acquired from recognized zoo
88	Purple Heron (*Ardea purpurea*)	0	0	0	0	3	3	0	6	3	3	0	6	To be acquired from recognized zoo
89	Cattle Egret (*Bubulcus ibis*)	0	0	0	0	3	3	0	6	3	3	0	6	To be acquired from recognized zoo
90	Intermediate Egret (*Ardea intermedia*)	0	0	0	0	3	3	0	6	3	3	0	6	To be acquired from recognized zoo
91	Black Swan (*Cygnusatratus*)	0	0	4	4	4	4	0	8	0	4	0	4	To be acquired from recognized zoo
92	Mute Swan (*Cygnus olor*)	0	0	4	4	4	4	0	8	0	4	0	4	To be acquired from recognized zoo
93	White Chinese Goose (*Ansercygnoidesdomesticus*)	0	0	0	0	4	4	0	8	4	4	0	8	To be acquired from recognized zoo
94	Darter (*Anhingidae sp.*)	0	0	0	0	3	3	0	6	3	3	0	6	To be acquired from recognized zoo
95	Magpie Goose (*Anseranassemipalmata*)	0	0	0	0	3	3	0	6	3	3	0	6	To be acquired from recognized zoo
96	Abdim's Stork (*Ciconia abdimii*)	0	0	0	0	3	3	0	6	3	3	0	6	To be acquired from recognized zoo
97	Harlequin Duck (*Histrionicushistrionicus*)	0	0	0	0	3	3	0	6	3	3	0	6	To be acquired from recognized zoo
98	Paradise Shelduck (*Tadorna variegate*)	0	0	0	0	3	3	0	6	3	3	0	6	To be acquired from recognized zoo
99	Orinoco Goose (*Neochen jubata*)	0	0	0	0	3	3	0	6	3	3	0	6	To be acquired from recognized zoo
100	Indian cormorant (*Phalacrocorax fuscicollis)*	0	0	0	0	3	3	0	6	3	3	0	6	To be acquired from recognized zoo

101	Lesser Adjutant Stork (*Leptoptilos javanicus)*	0	0	2	2	2	2	0	4	2	2	-2	4	4 to be acquired from recognized zoo and 2 unsexed to be disposed
102	Lesser whistling duck, (*Dendrocygna javanica)*	0	0	0	0	2	4	0	6	2	4	0	6	To be acquired from recognized zoo
103	Gadwall (*Mareca strepera*)	0	0	0	0	5	5	0	10	5	5	0	10	To be acquired from recognized zoo
104	Pheasant-tailed Jacana (*Hydrophasianus chirurgus*)	0	0	0	0	4	4	0	8	4	4	0	8	To be acquired from recognized zoo
105	Bronze-winged Jacana (*Metopidius indicus*)	0	0	0	0	4	4	0	8	4	4	0	8	To be acquired from recognized zoo
106	Bar-headed Goose (*Anser indicus*)	0	0	0	0	4	4	0	8	4	4	0	8	To be acquired from recognized zoo
107	Indian Moorhen, *Gallinula chlorophus*	0	0	0	0	2	5	0	7	2	5	0	7	To be acquired from recognized zoo
108	Muscovy duck,*Cairina moschata*	0	0	0	0	2	4	0	6	2	4	0	6	To be acquired from recognized zoo
Reptiles														
109	Marsh Crocodile (*Crocodylus palustris*)	0	0	0	0	3	2	0	5	3	2	0	5	To be acquired from recognized zoo
110	Gharial (*Gavialis gangeticus)*	0	0	0	0	3	2	0	5	3	2	0	5	To be acquired from recognized zoo
111	Water monitor lizard *(Varanus salvator)*	2	2	0	4	2	2	0	4	0	0	0	0	To be acquired from recognized zoo
112	Yellow Monitor Lizard *(Varanus flavescens)*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
114	Bengal Monitor Lizard *(Varanus bengalensis)*	0	0	2	2	2	2	0	4	2	2	-2	4	4 to be acquired from recognized zoo and 2 unsexed to be disposed

115	Green Iguana (*Iguana iguana*)	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
116	Indian star tortoise (*Geochelone elegans*)	0	0	9	9	10	10	0	20	+10	+10	-9	20	20 (10:10) to be acquired and 9 unsexed to be disposed
Constrictor House														
117	Indian rock python, (Python molurus)	0	0	2	2	2	4	0	6	2	4	-2	6	6 to be acquired from recognized zoo and 2 unsexed to be disposed
118	Reticulated Python, (*Malayopython reticulates)*	0	0	0	0	2	4	0	6	2	4	0	6	To be acquired from recognized zoo
119	*Burmese python* (Python bivittatus)	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
120	*Yellow Anaconda (*Eunectes notaeus)	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
121	*Green Anaconda (Eunectes murinus)*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
Snake House														
122	Monocled Cobra *(Naja kaouthia)*	0	0	2	2	4	4	0	8	0	0	-2	8	8 to be acquired and 2 unsexed to be disposed
123	Spectacled Cobra *(Naja naja)*	4	4	0	8	4	4	0	8	4	4	-4	8	8 to be acquired and 4 unsexed to be disposed
124	King Cobra *(Ophiophagus hannah)*	0	0	0	0	4	4	0	8	4	4	0	8	To be acquired from recognized zoo
125	Banded Krait (*Bungaurus fasciatus*)	0	0	0	0	4	4	0	8	4	4	0	8	To be acquired from recognized zoo
126	Russell's Viper (*Daboia russelii*)	0	0	2	2	4	4	0	8	0	0	-2	8	8 to be acquired and 2 unsexed to be disposed
PISCES														
1.	Suckermouth catfish (*Hypostomus plecostomus)*	0	0	0	0	0	0	10	5	0	0	5	5	**nn**
2.	Yoyo Loach (*Botiaalmorhae*)	0	0	0	0	0	0	5	5	0	0	5	5	**n**

3.	Zebra Cichlid (*Archocentrus nigrofasciatus*)	0	0	0	0	0	0	5	5	0	0	5	5	**nn**
4.	Odessa Barb (*Pethiapadamya*)	0	0	0	0	0	0	5	5	0	0	5	5	**nn**
5.	Arulius Barb (*Dawkinsia arulius*)	0	0	0	0	0	0	5	5	0	0	5	5	**n**
6.	Honey Gourami (*Trichogaster chuna*)	0	0	0	0	0	0	5	5	0	0	5	5	**n**
7.	Dwarf Gourami (*Colisalalia)*	0	0	0	0	0	0	5	5	0	0	5	5	**n**
8.	Blue Badis (*Badisbadis)*	0	0	0	0	0	0	5	5	0	0	5	5	**n**
9.	Zebra Fish (*Danio rerio)*	0	0	0	0	0	0	5	5	0	0	5	5	**n**
10.	Denison barb (*Sahyaeria denisonni*)	0	0	0	0	0	0	5	5	0	0	5	5	**n**
11	Frail Gourami (*Ctenops nobilis*)	0	0	0	0	0	0	5	5	0	0	5	5	**n**
12.	Bengal Loach (*Botia Dario*)	0	0	0	0	0	0	5	5	0	0	5	5	**n**
13.	Blue Spotted Hill (*Barilius bakeri*)	0	0	0	0	0	0	5	5	0	0	5	5	**n**
14	Glo/Widow Tetra (Gymnocorymbus ternetzi)	0	0	0	0	0	0	5	5	0	0	5	5	**nn**

M: Male
F: Female
U: Unknown Sex

N. B. Keeping these above animals will make people aware about the importance of Conservation as well as educate the people to identify animals with their habit and habitat of different flora and fauna for long term conservation of biodiversity in this region.

Sl No.	Class	Native Species	Non-Native Species
1.	Mammalia	23	-
2.	Aves	56	29
3.	Reptilia	15	-
4.	**Pisces**	10	4
	Total	104	33

Native: Non Native Ratio- 75.912:24.0875

4.2 Description of the Master Layout Plan of the zoo

Due to the space constraint and lot of available infrastructure and built-in enclosures, the animals proposed in collection plan are grouped into following zones. The Total area of the Junglemahal Zoological Park is 56.6027 Ha including proposed Tiger Safari area of 26.5269Ha (Annexure-). The proposed area for Animal enclosures in Zoo is 66764 Sqm. which is approx. 22.20 % and the green zone has increased to 183877 Sqm. which is 61.14%. of the zoo area.

TABLE : IV

Area Statement of Junglemahal Zoological Park

AREA OF ZOO	30.0758 Hectare	74.319 Acres
AREA OF TIGER SAFARI	26.5269 Hectare	65.549 Acres
TOTAL	56.6027 Hectare	139.868 Acres

TABLE : V

AREA STATEMENT OF ZOO (Excluding Safari)		
SL. NO.	**DESCRIPTION**	**AREA IN SQM.**
1	ENCLOSURE WITH N.S. & KRAAL	66764 (22.20%)
2	C.B.C. OF PANGOLIN	375 (0.13%)
3	RESCUE CENTRE	2000 (0.67%)
4	QUARANTINE CENTRE	120 (0.04%)
5	VISITORS PATHWAY	8680 (2.88%)

6	SERVICE PATHWAY	6387 (2.12%)
7	BUILDING STRUCTURE	2290 (0.76%)
	A. ZOO AMENITIES - 1504 SQM.	
	B. VISITORS AMENITIES - 786 SQM.	
8	PARK	1600 (0.53%)
9	STAFF QUARTER AREA	4250 (1.41%)
10	FODDER FIRM	6700 (2.23%)
11	WATER BODY	17715 (5.89%)
12	GREEN ZONE	183877 (61.14%)
	TOTAL ZOO AREA	**300758 (100.00%)**

TABLE : VI

LIST OF ENCLOSURE WITH AREA

SL.NO.	DESCRIPTION	AREA IN SQM.
1	FLYING BIRD AVIARY	450
	i) Hawk (Native)	
	ii) Gyps Vulture (Native)	
2	FLYING BIRD AVIARY	80
	i) Red Lory (Non Native)	
3	FLYING BIRD AVIARY	400
	i) Victoria Crowned Pigeon (Non Native)	
	ii) Helmeted Curassow (Non Native)	
4	FLYING BIRD AVIARY	400
	i) Red & Green Macaw (Non Native)	
	ii) Blue & Yellow Macaw (Non Native)	
5	FLYING BIRD AVIARY	400
	i) Scarlet Macaw (Non Native)	
	ii) Amazon Parrot (Non Native)	
6	FLYING BIRD AVIARY	300
	i) Grey Parrot (Non Native)	
	ii) Eclectus Parrot (Non Native)	
7	FLYING BIRD AVIARY	300
	i) Greater Sulphur Crested Cockatoo (Non Native)	
	ii) Lesser Sulphur Crested Cockatoo (Non Native)	
8	FLYING BIRD AVIARY	300
	i) Umbrella Cockatoo (Non Native)	
	ii) Black Cockatoo (Non Native)	
9	FLYING BIRD AVIARY	300
	i) Cockatiel (Non Native)	

	ii) Red-breasted Toucan (Non Native)	
10	EMU (FLIGHTLESS)	820
11	CASSOWARY (FLIGHTLESS)	785
12	WATER BIRD AVIARY	1350
13	PHEASANTRY	480
	a) Silver Pheasant - 80 Sqm	
	b) Golden Pheasant - 80 Sqm.	
	c) Indian Peafowl - 160 Sqm.	
	d) Lady Amherst's - 80 Sqm	
	e) Khalij Pheasant - 80 Sqm	
14	WALK-IN BIRD AVIARY (NATIVE)	22080
	TOTAL	**28445**
CARNIVORE		
15	SLOTH BEAR	1000
16	OTTER	400
17	LEOPARD	900
18	WILD DOG	600
19	BENGAL FOX	550
20	STRIPED HYENA	550
21	GOLDEN JACKAL	550
22	ASIATIC LION	1700
23	JUNGLE CAT	300
24	LEOPARD CAT	300
25	FISHING CAT	300
26	BENGAL TIGER	2250
27	INDIAN WOLF	800
	TOTAL	**10200**
HARBIVORE		
28	HIPPO	3050
29	MIXED DEER	7380
	i) Spotted Deer	
	ii) Barking Deer	
	iii) Sambar	
	iv) Hog Deer	
30	MIXED ANTIPOLE	7500
	i) Blackbuck	
	ii)White Blackbuck	
	iii) Four Horned Antelope	
	iv) Nilgai	
	v)Chinkara	
	TOTAL	**17930**
REPTILE		
31	INDIAN STAR TORTOISE	100
32	GREEN IGUANA	60
33	BENGAL MONITOR LIZARD	80
34	YELLOW MONITOR LIZARD	80
35	WATER MONITOR LIZARD	80
36	GHARIAL	3200
37	MARSH CROCODILE	3000

38	SNAKE HOUSE	200
	i) Monocled Cobra - 40 Sqm.	
	ii) Spectacled Cobra - 40 Sqm.	
	iii) King Cobra - 40 Sqm.	
	iv) Branded Krait - 40 Sqm.	
	v) Russell's Viper - 40 Sqm.	
39	CONSTRICTOR HOUSE	400
	i) Indian Rock Python - 80 Sqm.	
	ii) Reticulated Python - 80 Sqm.	
	iii) Burmese Python - 80 Sqm.	
	iv. Yellow Anaconda - 80 Sqm	
	v. Green Anaconda - 80 Sqm	
	TOTAL	**7200**
FOSSORIAL		
40	PANGOLIN	200
41	PORCUPINE	200
	TOTAL	**400**
PISCES		**225**
	i. Suckermouth catfish, ii. Yoyo Loach, ii. Zebra Cichlid, iv. Odessa Barb, v. Arulius Barb, vi. Dwarf Gourami, vii. Blue Badis, viii. Zebra Fish, ix. Denison barb, x. Frail Gourami, xi. Bengal Loach, xii. Dwarf Gourami, xiii. Blue Spotted Hill, xiv. Glo/Widow Tetra	

Carnivore Section

Bengal Tiger Safari (*Panthera tigris*)

The population of these majestic creatures has drastically decreased in recent years. In order to contribute to the preservation of this species and increase public awareness of the significance of its conservation, these big cats will be the primary attraction for the safari, drawing a lot of people.

The safari will be established in a forest area neighboring Junglemahal Zoological Park of the Jhargram district for which the West Bengal Zoo Authority, Department of Forest has earmarked a 26.52 hectare patch of land which has a network of uneven jungle road. As the area is supported by natural vegetation with moderately undulated terrain best suited for the Tiger safari. Infrastructure to the new safari is proposed as follows:

(a) It is proposed to develop 3.6 km length of safari road to facilitate the visitors vehicle movement

(b) It is proposed to create two numbers of artificial water pond in an area of 150 sq m each at suitable points depending upon the drainage within the

safari. It is proposed to build animal night shelter in the south-west corner in the proposed Tiger safari. Each animal house will have six number of animal holding cell along with 2 nos of squeeze cages. The entire area of Tiger safari will be barricaded with open natural ditch which will serve as moat and chain link mesh fence will also be erected over the safari boundary. Both the animal houses will be provided with underground drainage connected to an exclusive soak pit which will be cleaned and sanitized periodically.

(c) Staff infrastructure and visitors' amenities will be developed among other facilities.

Bengal Tiger Enclosure (*Panthera tigris*)

An area of 2250 Sqm has been identified for housing Bengal Tiger in the Zoological Park. The paddock area, kraal and night shelter with isolation facilities have been planned to be developed for the better upkeepment of the animal. Enclosure will be built at the middle portion of the park, opposite to proposed Walkin Bird Aviary and in between Indian Grey Wolf and Fishing cat Enclosure.

Enrichment Plan:

i. Wall Painting: To make them feel that they are in the wild natural habitat.
ii. Water pools: For bathing, cooling and drinking purpose.
iii. Rocky area: For their natural movement.
iv. Wooden logs: For scratching their nails and rubbing their body.
v. Resting platform/Den: To take rest.
vi. Termite mound: Termites are a valuable source of protein, fat and essential amino acids and also the termite mound keeps them busy for the whole day.
vii. Puzzle feeder: To enhance their activities throughout the day.
viii. Placing of feed at an elevated level
ix. Rotation of prey species.
x. Hanging wooden ball inside the animal enclosure.

Asiatic Lion (*Panthera leo*)

An area of 1700 sqm has been identified for the Lion enclosure. The paddock area, 2 nos. of kraal and night shelter with isolation facilities has

been planned in a space between Jungle cat and proposed crocodile enclosure.

Area proposed for enclosure	**Enrichment**
1700 sqm	Enrichment will be accomplished by presenting novel food items (or presenting food in different ways), as well as novel objects and smells. The presentation of new items and scents will help relieve boredom and improve the overall welfare of the animals. All materials need to be biodegradable, digestible and non-toxic and should not pose any threat to the animal. The large enclosures incorporate the natural landscape, providing their residents with opportunities to climb, roam, run and explore the different scents and textures that they may have encountered in the wild. Platforms and creation of temporary den inside the enclosure can be used as an alternate place to perch and feed. Logs inside the enclosure can increases their playing activity.

Wild Dog/ Dhole (*Cuon alpinus*)

An area of 600 sqm of has been allocated for Indian Wild Dog enclosure. This is located in between Bengal Fox and Leopard enclosure. Southern side of the Wild Dog enclosure, Hyena enclosure already been existing. Landscape around animal exhibit/ enclosure comprised of plantations of appropriate tree and shrub species of adequate extent and of such shape that the enclosure will not be visible to the visitors from any place other than the animal viewing areas. All the hard exteriors of the enclosure i.e. the enclosure barrier and the frontage of the night shelters will be effectively camouflaged through planting of bamboo, dwarf tree species and shrubs.

Enrichment Plan:

Area proposed for enclosure	**<u>Enrichment</u>:**

600 sqm	**Environmental (or structural) enrichments:** Trees, shrubs and structures providing shade will be provided for shade. Logs and Tree Branches: Big logs can be packed at angles to one another. Branches will be placed against logs or other objects. Logs and branches provide areas to hide and scatter food to encourage foraging as well as elevated areas to stand and lie on. Platform: Platforms provide an elevated place to view surroundings, provide a spot for sunning themselves and allow wild dogs to get off the ground when wet or muddy. We can feed them on top of the platform. **Olfactory (or food-based) enrichments:** Hiding or Scattering Food: Dholes are foragers and hiding or scattering food in their enclosure encourages this natural feeding behaviour. Placing meals inside cardboard boxes or paper towel rolls forces our wild dogs to work for their food. Placing treats, such as pieces of meat, inside a hollowed-out pumpkin or watermelon with holes encourages wild dogs to try different retrieval techniques. Rubbing coconut oil on objects such as logs and tree limbs will encourage much sniffing, licking, rubbing and rolling. Animal feces, such as horse or elephant dung, results in much olfactory investigation. **Customised enrichments:** Wild dogs are naturally curious animals so any novel objects that encourage them to search, sniff, probe with nose or paw, chew, bury or squabble over provides good enrichment. Novel objects are a good way of hiding food and encouraging foraging behaviours.

Fossorial Mammal- Porcupine & Pangolin

Porcupine (*Hystrix indica*):

An area of 200 Sqm has been identified for the Porcupine enclosure. The enclosure which was made for pangolin will be modified to keep Porcupine at the zoological park. New enclosure will be constructed for Pangolin in the area which has been identified for Porcupine in last approved Master (Layout) Plan.

For Porcupine, 0.5 m deep soil will be given as substrate in the enclosure. A six centimetre thick reinforced concrete base with 5 cm × 5 cm chain-link mesh netting will be provided at the bottom of the soil layer to prevent escape of the animals. On all four sides above the concrete base up to height of 1.0 meter, reinforced concrete wall is proposed to be erected. To facilitate proper ventilation and natural sunlight, chain-link mesh netting will be provided on all four sides above the level of concrete base. An earthen mound of 2 m × 2 m × 1 m dimensions will also be provided to facilitate digging by pangolin.

An earthen mound of 2 m × 2 m × 1 m dimensions will also be provided to facilitate digging by pangolin to move into the deep burrows during day.

Enrichment Plan:

1. Provision for digging, foraging.
2. Provision of underground hollows for sleeping
3. Provision of a deep soil floor in the enclosure and turning over this soil every month or more to provide novelty.
4. Provision of mutliple denning options (e.g. bedbox, hollows and burrows) so the animals can exercise choice hence decrease stress. 8. Changing furniture (branches) every second month, to provide novelty and alternative physical pathways so the animal exercises slightly differently..

Food Enrichment:

1. Hiding food underground, requiring animals to locate and dig up the

nest.

2. Placing food inside a paper box, into which small holes (15mm) have been drilled. Porcupines use their tongue to extract the food from these boxes.
3. Provision for chewing of foods.
4. Hiding their diet in palm fronds.
5. Hiding treats for porcupines to sniff out.

Pangolin (*Manis crassicaudata*):

An area of 200 sqm has been identified for the Pangolin enclosure at the eastern part of the park in the proposed Master (Layout) Plan. This was initially identified for Porcupine enclosure in the last approved Master (Layout) Plan.

For Pangolin, 0.5 m deep soil will be given as substrate in the enclosure. A six centimeter thick reinforced concrete base with 5 cm × 5 cm chain-link mesh netting will be provided at the bottom of the soil layer to prevent escape of the animals. On all four sides above the concrete base up to height of 1.0 meter, reinforced concrete wall is proposed to be erected. To facilitate proper ventilation and natural sunlight, chain-link mesh netting will be provided on all four sides above the level of concrete base. An earthen mound of 2 m × 2 m × 1 m dimensions will also be provided to facilitate digging by pangolin.
An earthen mound of 2 m × 2 m × 1 m dimensions will also be provided to facilitate digging by pangolin to move into the deep burrows during day

Enrichment Plan:

1. Provision of soil for digging
2. Provision of tree hollows for sleeping
3. Provision of climbing branches
4. Provision of ropes and unstable climbing objects to improve balance and physical fitness
5. Provision of a pool for swimming
6. Provision of a deep soil floor in the enclosure and turning over this soil every month or more to provide novelty.

7. Provision of multiple denning options (e.g. bedbox, hollows and burrows) so the animals can exercise choice hence decreases stress.
8. Changing furniture (branches) every second month, to provide novelty and alternative physical pathways so the animal exercises slightly differently. Each enclosure should have one small pond as a water source and for bathing.

Food Enrichment: Enrichment activities related to feeding have included:

1. Feeding a wild diet of live ants within a nest. This provides an opportunity to express natural foraging behaviors.

2. Placing ant nests on the branches within the enclosure to make access more challenging.

3. Hiding ant nests underground, requiring animals to locate and dig up the nest.

4. Collecting wood/debris containing termites, and placing them in enclosure for the animals to find.

5. Placing frozen food inside a plastic box, into which small holes (15mm) have been drilled. Pangolins use their tongue to extract the food from these boxes.

6. Provision of leaf litter on the floor of the enclosure to attract insects and provide hiding places for insects for the pangolins to find.

7. In captivity, it is very difficult to replicate natural behaviours. Insect dispensers can be fashioned from rotten logs and impart a functional naturalism to the enclosure.

Conservation Breeding Centre of Pangolin:

An area of 375sqm has been identified for Conservation Breeding Centre of Pangolin at the extreme southern end of the Park opposite proposed Mixed Deer enclosure. There will be craal and house facility as per CZA guidelines. Animals will be acquired from other recognised zoo in India.

Small Clawed Otter (*Aonyx cinereus*)

An area of 400 sqm. will be designed as small clawed otter enclosure which is adjacent to leopard cat enclosure. It will be an open top enclosure. There will be a night shelter at the rear end while the front will have viewing side through chain link fence. The whole enclosure will have a chain link fence of the size of 5cm x 5cm x 8g. The height of the rear barrier will be 4m with

inward steel plate of 1m length at the top and should be placed at an angle of 600. The front barrier will be V-shaped dry moats on the visitor side.

Enrichment Plan:

1. A water pool will be created with sufficient depth where fishes will be reared.
2. Feeding or offering enrichment in the water encourages natural foraging behaviours.
3. Sand, bark, grass and gravel will be placed to encourage natural grooming behaviours which helps keep their fur in good condition.
4. Multiple hiding spaces will be provided that will give the otters a choice as to whether they want to retreat or not.
5. Hollowed logs and artificial dens can be used.
6. Varieties of prey items will be offered.

Herbivore Section

Mixed Deer Enclosure

A Mixed Deer Enclosure will be constructed within an area of 7380 Sqm to accommodate different deer species and the existing one will be demolished to make a walk-in bird aviary. Mixed Deer Enclosure will have an open space, escape zone, mud wallow, green zone, night shelter with isolation facilities. Feeding shells with proper sheds will be constructed inside the enclosures. Enclosures will have chain-link fencing with iron post over 235 m. with a height of 2.75 mt. Vegetative standoff barrier is to be raised around the periphery of the Deer enclosure to make available at least 30% of the area for the visitors. Fodder grass plantation will be done in the 25% of the area within the enclosures by making chain link fencing within after 2-3 years when the plantation will be established fodder area will be opened to the animals. Rotationally the area will be planted. The following deer species will be kept in the enclosures.

Mixed Deer Enclosure I

1. Spotted Deer (***Axis axis)***
2. Barking Deer (***Muntiacus muntjak)***
3. Sambar (***Rusa unicolor***)
4. Hog Deer (***Axis porcinus***)

Mixed Antelope Enclosure

A new mixed antilope enclosure will be constructed with an area of 7500 Sqm. opposite to the walk-in bird aviary to house different species of antelope proposed to be acquired from different zoos of India. The fencing of the enclosure will be made up with chain-link with iron post with a height of 2.75 mt. and barbed wire will be used at the top in 4 layers of 0.15 mt gap. Stand-off fence at a distance of 1.50 mt from the original fence. Night shelter, feeding-drinking trough, quarantine etc are to be constructed. This enclosure will be used for keeping Blackbuck (*Antilope cervicapra),* Four Horned Antelope (*Tetracerus quadricornis*), Chinkara (*Gazella bennettii*) and Nilgai (*Boselaphus tragocamelus*).

Enrichment Plan of Mixed Deer Enclosure and Antilope Enclosure

Area proposed for enclosure (sq. mt.)	**Enrichment Plan**
Mixed Deer Enclosure 6610 Sqm Mixed Antelope Enclosure-7500 Sqm	Enrichment i) Groove of bushes will be provided. ii)Adequate poles/log to rub horns/antlers and scratching will be fixed. iii) Salt lick blocks will also be kept. iv) Food will be provided in 2-3 places. v) Mud wallows to be provided vi) Natural tree as shade and grassland for grazing. vii) Variety of feeding sites at varying heights. viii) Objects securely suspended from high locations. ix) Mixed species for social stimulation.

Exotic Herbivore Section

Hippopotamus (*Hippopotamus amphibious*)

Hippopotamus enclosure proposed to be constructed in an area of 3050 sqm, northern side of the park, opposite to proposed Emu and Cassowary enclosure. The area has open space, grassland, vegetation zone, feeding area, night shelter and natural water body. The open space has been

planned for grazing and movement of the mega herbivore. A large water body has already been there within the identified space for the species.

Enrichment Plan

Area proposed for enclosure	Enrichment
3050 sq. mt.	• Having large grass areas for the hippo to naturally graze is important. Scatter feeding of grass and hay and offering grass and hay throughout the night can help replicate their feeding behaviours. Feeding fruits, vegetables and leaves in the water can be good enrichment. • Water bodies must be large enough to accommodate a family group. It must be at least 2 metres deep to allow for complete submersion. It must have shallow edges for ease of access for the animals and to allow them to rest in the shallow water. • The size of the enclosure is important in keeping a large, group well in captivity. It needs to be complex as well, with plenty of grazing opportunities, logs and rocks, different substrates and mud wallows. Allowing hippo to create "middens" (specific areas where they will defecate on land) is important for communication. • Giving hippopotamus' the space and opportunities to decide where they want to spend their time is important. Having shelters and housing gives them choice in different weather conditions. • Social interaction and play are stimulated in and around a mud wallow. As well has health benefits to the hippopotamus' skin, mud wallows are important for mental and physical health. Care must be taken to monitor the mud to make sure it does not become stagnant.

Reptile section

Gharial (*Gavialis gangeticus*)

The Gharial enclosure will be constructed at the south-eastern side of the zoological Park with an area of 3200 sqm. The pond will be fenced by wire net of 1.5 m height to house the animals. Surrounding the first fence, one more wire net fencing of 1.5 m height will be constructed to restrict the visitor's activities. The shoreline of the pond will be sandy and slope is maintained to enable Gharials to easily reach the shoreline. The sand bed is maintained for egg laying and basking of Gharials.

Marsh Crocodile (*Crocodylus palustris*)

The proposed enclosure will have an area of 3000 sqm and used for turtle will be redesigned to house Marsh Crocodile. The pond will be well fenced by wire net of 1.5 m height to house the animals to the pond. Surrounding the first fence another wire net fencing of 1.5 m height has been constructed to restrict visitor's activities. The total basking and egg laying area is 800.0sqm.

Area proposed for enclosure	**Enrichment**
Land allocation: Gharial: 3200 sqm. Marsh Crocodile – 3000 sqm.	The enclosures will be covered by chain link fence all around and toughened glass at the visitor's side. A water body with a depth will be developed. The rest of the area will have sand and soft soil. There will be an inlet and out let to maintain the water level. There will be a service gate towards the service road in exhibit. Enrichment: (1) Shady trees will be provided. (2) Sand beds with palicades will be provided. (3) Flow of water will be maintained to check over heating in summer.

Monitor Lizards

There will be three species of Monitor Lizards proposed to be made in the Zoological Park. The area identified for each enclosure will be of 80 sqm. It is located at the north eastern part of the Zoological Park. A proper enrichment will be provided ensuring the entrance of sunlight.

Species to be housed are

- Yellow Monitor Lizard (*Varanus flavescens*)
- Water Monitor Lizard (*Varanus salvator*)
- Bengal Monitor Lizard (*Varanus bengalensis*).

Enrichment Plan

Each Monitor Lizard enclosure will have a pool, a feeding area, a sunbathing area, a green zone, and a place for nesting. Water bodies will be built within the paddock area. There will be trees, perches and logs. Misting will also be done and temperature will be controlled during the winter months. There will be an access to viewing of animals through toughened glass.
In each enclosure, 3:3 individuals will to be housed.

Constrictor House

The Constrictor house proposed to be constructed over an area of 400sqm for housing three species of Python and two species of Anaconda near to Hippo enclosure at the North east corner of the Zoo area.

Species to be housed are:

Indian rock python, Reticulated Python, *Burmese python*, Yellow Anaconda

and Green Anaconda

Snake House

A snake house is proposed to be made within an area of 200 sqm. beside Indian Grey Wolf enclosure. This will be constructed opposite to the proposed walk-in bird aviary to house five species of venomous and non venomous snake. For each of snakes 40sqm allocated to construct enclosures.
Species to be housed are

- Monocled Cobra *(Naja kaouthia)*

- Spectacled Cobra *(Naja naja)*
- King Cobra *(Ophiophagus hannah)*
- Banded Krait (*Bungaurus fasciatus*)
- Russell's Viper (*Daboia russelii*)

Enclosure enrichment for snakes

1. The enclosure will be imitated by the surroundings in which that particular reptile is found in.
2. Drainage, Sanitation, heating, Lighting and ventilation are important parameters.
3. The space of the enclosure will be large enough to permit a proper temperature gradient to be set up and maintained.
4. Glass cages will be made to have excellent visibility.
5. Snakes have an excellent sense of smell to make up for their bad eyesight. Adding new smells to their enclosure can be a great way to improve the quality of their life, Moss would be an excellent choice and it will also provide snake with a new texture to move across. Basil can be used in small quantities. Potted plants such as pothos, spider plants, and bamboo can also be used inside the enclosures.
6. Rocks will be added (make sure they have no sharp edges) which will give snake something new to slither over and smell, plus they can use it to help pull their shed off.
7. Vines, leaves, and hammocks are great for snake enrichment too. For small snakes, paper towel tubes can provide a cool tunnel to slither through and hide in.
8. Proper hiding places to be placed. Like artificial ant hill or tunnels.
9. Ceramic heaters, heating mats, under gravel heaters, Heating plates or pig blankets will be used for controlling of temperatures.
10. Proportional temperature controller like Resistive temperature detector will be used.
11. Proper sunlight or artificial light of certain wavelengths can be used as diurnal reptiles use certain wavelengths for D_3 synthesis. In open enclosures, mercury vapour lamps can be used to create twilight essence. Fluorescent tubes and infrared lamps should be kept at a distance of 50 cm which will supply a wide spectrum range of lights.

Iguana (*Iguana iguana*)

An area of 60 sq. m has been identified for an open air enclosure of the Iguana. The enclosure will have feeding zone, basking zone, green zone and site for nesting of Iguana. It is proposed to house 3:3 individuals in the enclosure.

Indian Star tortoise (*Geochelone elegans*)

An enclosure for Indian Star tortoise (*Geochelone elegans*) proposed to be constructed over an area of 100 sqm beside Iguana enclosure.

For Tortoise shade will be provided, small igloo shaped shelter will be constructed. The enclosure will be ensuring entrance of enough sunlight. A small water poodle will be built where they can soak themselves in water.

Aviary:

The total area of the aviary & other enclosure is 28445 sq. m.

Following types of Aviary proposed to be made in Junglemahal Zoological Park.

i. 15 nos. of Non-native Flying Bird Aviary
ii. 2 nos. of Native Flying Bird Aviary
iii. 5.nos. of Pheasantry including Peafowl Enclosure
iv. 2 nos. of Flightless Bird Aviary
v. Walk-in aviary of Native species
vi. Water Bird Aviary

i. Non-native Flying Bird Aviary

An area of 2480 sqm has been allocated for Non-native flying bird aviaries to be constructed within zoo premises. The enclosures for Large Indian Civet, Small Indian Civet, Common Langur, and Rhesus Monkey will be modified to make the enclosures for the Non Native Flying Bird Aviaries. There will be fifteen enclosures to house fifteen (15nos.) different species of Non-native flying birds. The areas of each enclosure are mentioned in the

Table IV & V. The height of chain link fencing will be 6.00m and the distance between fencing and standoff barrier will be 1.00m. Species to be housed are Scarlet Macaw, Yellow & blue Macaw, Red & Green macaw, Grey Parrot, Eclectus Parrot, Amazon Parrot, Umbrella cockatoo, Black cockatoo, Greater and lesser Sulphur-crested cockatoo, Red Lory, Victoria Crowned Pigeon, Helmeted Curassow, Cockatiel, Red-breasted Toucan.

ii. Native Flying Bird Aviary

An area of 450 sqm has been allocated for two species of flying bird aviary to be constructed in between proposed Walk-in aviary and water bird aviary at the northern side of the park. Species to be housed are Hawk and Gyps vulture.

Area proposed for enclosure (sq. mt.)	**Enrichment Plan**
450 sqm	The minimum prescribed size of CZA for the outdoor enclosures of Aviary will be followed . Flying Bird Aviary will be covered with wire mesh of size of 2 cm x2 cm. **Exhibit Enrichment** (1) Perches of various heights, widths, lengths, shapes/textures/materials and diameters will be provided. This can be done with potted plants and trees. (2) Small size tree / bushes will be planted. (3) Nest boxes, logs, earthen pots, platforms, and burrows, will be provided for nesting. (4) Nesting material will be provided. (5) A range of substrates such as sand, peat moss, or soil will be provided for dust bathing of birds. (6) Each enclosure will be provided water body with pools or small pans. (7) Sprinklers can also be used in the display on a regular basis, or the birds can be misted by hand. **Dietary Enrichment** It's simple to incorporate a bird's diet into its daily enrichment. Food items should be presented in a unique and fascinating way to enhance foraging. Live prey such as insects, fish, lizards, and squid will be provided using slow release

	feeders in an exhibit on a regular basis. Scattering food items throughout the exhibit, piercing produce on tree limbs and breaking up feeding times during the day can be helpful. Offering flowered browse to nectar feeders can achieve the same goal. Rats or fish can be hidden inside PVC pipes, burlap sacks or Kong toys, or frozen in a block of ice for bird of prey species to provide more stimulation during feeding and foraging activities. **Novel Enrichment/Social Enrichment** Many birds have a curious and even playful nature. To encourage them to display their curious behaviors, novel items canbe introduced in the exhibit .Like providing a wide variety of toys and rotating and changing out toys weekly. Musical Instruments for birds is an Artistic Contribution toward Auditory Enrichment.

i. Pheasantry

There are five number of Pheasantry already been exist in the Junglemahal Zoological Park at present. Out of five enclosures, four of them have 80m^2 areas for housing Golden, Silver Pheasant, Kalij Pheasant, Lady Amherst Pheasant and fifth one will have 160sqm to house Indian Peafowl.

Enrichment Plan:

Habitat Enrichment:

Tree branches will be used for perching. These ranged in height from six to eight feet, and also provided multiple levels of perching areas. These will be served as roosting grounds during the night inside the enclosure.
Bamboo mats will be tied to the mesh partitions between enclosures to a height of four feet. These mats can be served as visual barriers among adjacently housed pheasants. Bamboo grasses can be planted inside the enclosure and along the side walls of the enclosure, intended to provide privacy and at the same time offer areas of concealment for the pheasants.

Wooden platforms: Wooden platforms will be placed inside the enclosure at a height of about two feet from the ground. The platforms will be covered from the top and on the two sides and need to be positioned at the farther end of the enclosure, away from the viewing areas. These will be served as nesting sites and also to provide privacy to the pheasants. The platforms should be covered with straw, not hay (mould can grow on hay easily), which will serve as nesting material. Multiple platforms should be provided at various heights so that the birds get an opportunity to choose their preferred nesting site.

Dust bath: Pheasants need dry sandy areas to dust bathe; an activity for feather maintenance that soaks up excess moisture and removes parasites that infest the feathers. Therefore a suitable dust bathing area needs to be provided. If the aviary floor is not covered with sharp sand, it is probably best to provide a sandy, dusty area in a spot which gets plenty of sun. It is best to ensure that the dusting area drains well and dries out quickly after rain.

Feeding enrichment:

Before establishing dietary enrichment for pheasants, our key goals were to improve bird activity, stimulate the use of greater cage space, and adjust their diet and feeding schedules to reflect natural conditions. The enclosure floor will be littered with leaf litter and food grains will be scattered about.

In addition, Enrichment Plan for peacock Enclosure is:

Peacocks are active birds and need plenty of opportunities to perch, scratch, and forage. Considering, perches, branches, and other natural elements will be added to the enclosure to provide enrichment and exercise.

The Peafowl enclosure will have water pools, perches and nest at various locations. The floor will be landscaped, along with an inlet and outlet to let water flow into the pool.

Peacocks will have access to clean water at all times. The water container will be large enough for the peacocks to drink and bathe in. Bathing helps keep the feathers clean and healthy.

The flooring of the peacock's housing will be covered with a suitable substrate that allows for easy cleaning and provides insulation. Bedding material such as straw, wood shavings, or sand will be used to provide a comfortable surface for the birds to walk and rest.

Peacocks will have roosting area that is more than 6 feet off the ground. The roosting areas will be wide enough to accommodate their long tail feathers and provide enough space for all of your birds.

A separate area for nesting boxes will be built by Making sure the area is quiet and private, and will provide plenty of nesting material such as straw or hay.

A feeding area will be provided that is separate from the roosting and nesting areas.

ii. Flightless Bird Aviary

Emu Enclosure:

The paddock area for Emu enclosure will be 625Sqm. There will be Kraal and feeding cell for the birds. A galvanized Chain link mesh fence is to be made of the size 75mmX 75mm of 10gauge. The height of the fence will be 2500mm.

For Emu, enclosure floor will be grassed and non-slip surfaces. The edges of enclosures, alongside the fence, will be gravelled, that birds, especially emus, will step on the fence and wear out the ground.

Cassowary Enclosure:

The paddock area for Cassowary enclosure will be 785Sqm. There will be Holding area and feeding cell for the birds. Enclosure will be built with a high fence material (6ft minimum) and the top of the fence should have a protective covering to stop the Cassowary accidentally injuring themselves on any protrusions. The corners of the enclosure will be rounded to allow the bird continuous access to escape and not face the danger of stressing

out and being cornered or injuring itself while trapped in a corner. Access gates will have a double door system to add extra security and minimize escapes.

The sand nest will be placed away from the public to allow privacy and lower stress. Wallows, Plant of long grass sprouts and low shrubs will be added to the enclosure.

Flooring will be of concrete for temporary holding of birds. The holding area will have adequate shade to protect the animal from heat, rain, snow and other unfavorable weather. The holding area will also have feeding and watering tools that are well positioned off the ground with enough space to avoid aggression between birds.

v. Walk In Bird Aviary of Native species

A total of 22080sqm area, in front of the pheasantry has been allocated for making walk-in bird aviary to house native species of birds. For aviary, net of small mesh widths (20-40mm) will be used to make aviary. The identified species to be housed are Hill Mayna, Common Myna, Jungle Myna, Starling, Barbet and different species of Munia, Red Avadavat Red-whiskered Bulbul, Red-vented Bulbul, Tailor Bird, Purple Sunbird, different species of parakeet, Oriental Magpie robin, Black headed oriole, Asian Green Bee eater, Diamond Dove, different species of pigeon, Red Jungle Fowl, Black Patridge etc.

Enrichment Plan:

Birds in the wild are constantly discovering new things and working to get food, and feathered friend has the same instincts. A long period of inactivity causes boredom in birds, so foraging is a great way to stimulate their minds.
Provide natural tree branches in the cage for perching
–Provide bird toys in the cage
–Some easy to make and use toys are listed below: - Cat balls with bells inside – great for throwing around and making noise.
- Toilet rolls – empty or filled with treats
- Wooden pegs clipped into the side of the cage with treats attached
- Cardboard boxes with doorways cut out

- Cat litter trays filled with shredded paper with treats hidden in amongst the paper. It will also be filled with the tray with the bird's favourite foods to encourage natural foraging behaviours
- Wooden hanging blocks filled with foods/treats.

Enrichment Plan:

Peacocks are active birds and need plenty of opportunities to perch, scratch, and forage. Considering, perches, branches, and other natural elements will be added to the enclosure to provide enrichment and exercise.
The Peafowl enclosure will have water pools, perches and nest at various locations. The floor will be landscaped, along with an inlet and outlet to let water flow into the pool.

Peacocks will have access to clean water at all times. The water container will be large enough for the peacocks to drink and bathe in. Bathing helps keep the feathers clean and healthy.

The flooring of the peacock's housing will be covered with a suitable substrate that allows for easy cleaning and provides insulation. Bedding material such as straw, wood shavings, or sand will be used to provide a comfortable surface for the birds to walk and rest.

Peacocks will have roosting area that is more than 6 feet off the ground. The roosting areas will be wide enough to accommodate their long tail feathers and provide enough space for all of your birds.

A separate area for nesting boxes will be built by making sure the area is quiet and private, and will provide plenty of nesting material such as straw or hay.

A feeding area will be provided that is separate from the roosting and nesting areas.

vi. Water Bird Aviary

It will be constructed on the northern side of the park, opposite of the proposed Emu and Ostrich enclosures of an area 1350 sqm. The Centre height of the aviary will be 8-12mt and the height of side chain link fence will be 3-4mt.

Area proposed for enclosure	Remarks
Land allocation: **(Water birds aviary- 1350 sq m**	Small islands of different sizes with adequate trees and bushes will be created. The periphery of the water body will have thick row of typha plants. There will be a system of releasing the water and its exit. Pinioned birds will be released to create bird sanctuary type environment to attract free living local and migratory birds. Adequate food will be provided. Fish fry will be released to grow fish in the water body.

4.3 Staff requirement for Animal section:

The proposed staff requirement of each of these beats is tabulated below:

- Zoo keepers (1 no) & Animal attendants (2 nos.) are presently engaged on contractual basis, under the overall supervision of the Zoo Supervisor.
- Engagement of the balance manpower of the Animal section ie. Zoo keepers (4 nos.) may be outsourced on contract basis.
- Engagement of other 4 nos. Banasahayaks may be outsourced.
- Engagement of Assistant Zoo Supervisor (1 no.) may be done on regular basis.
- Engagement of Zoo Biologist may be outsourced on contract basis.

4.4 Vehicles & equipments for Animal section

Following vehicles, equipments& implements will be required to run this section smoothly:

- 4 wheeler vehicle: 1 no.
- 2 wheeler vehicle: 2 nos.
- Squeeze cages (mobile): 5 nos.
- Animal transportation cages: 10 nos.
- Pressure pumps: 3 nos.

- One Computer & accessories.
- Misc. Equipments such as food distribution vans, weighing machines, nets, ropes etc.

4.5 Proposals to address the inadequacies and short comings identified:

4.5.1 Animal Section:

Staff strength: 01 Keeper, 02 Attendant

Lack of adequate trained personnel

Trained personnel are necessary for the animal section to look after the animals in the zoo. We are conducting different capacity building for the staff in collaboration with different zoo in state of West Bengal.

4.5.2 Store and feed supply Section:

Staff strength: Nil

1. Alternate supply chain must be in place in case any emergencies and stoppage of food articles beyond normal circumstances. Doctors are advised to work out an alternative food regime for species specific requirements.
2. High pressure washing equipment (water jet) would be procured to clean the kitchen.
3. Crate with lids would be provided for transportation of food items from stores to different animal enclosures.
4. Battery operated vehicle required to be procured exclusively for transportation of feed items from centralised store.
5. Feed sample preserving system.

The Existing Kitchen cum store of the zoo has to be demolished and a new store cum kitchen is proposed to be constructed adjacent to the Night shelter of the Giraffe Enclosure.

Staff requirement:

Following staff will be required for smooth operation of this section:

- Cook cum store keeper: 1 no.
- Kitchen Attendant: 1 no.

Engagement may be outsourced on contract basis.

4.5.3 Sanitation & Drainage section:

The prime constraint of this section identified in the appraisal report is water logging in the different animal enclosures as well as for the entire Zoo premises. Since the zoo is undergoing through the development, Zoo Authority has to develop proper drainage system with the construction of each enclosure.

Staff requirement:

Following staff will be required for smooth operation of this section:

- Sanitary attendants: 3 nos.

Engagement may be outsourced on contractual basis.

4.5.4 Construction & maintenance section:

No separate construction & maintenance section is proposed. The existing arrangement of inviting open quotations & tenders from eligible contractors for construction & maintenance of civil, electrical and mechanical nature and supervision by the Engineering section of WBZA is found to be effective.

Staff strength: Nil

4.5.5 Security Section:

Staff strength: 01 Gate Keeper, 20 Security & Night Guard

1. More Video – Surveillance system (CCTV Cameras) to be installed at important locations to improve the effectiveness of security system.
2. Regular training to the security personnel to be more accountable.
3. Rotation of security personnel to prevent familiarity for providing better security.
4. Updating equipments.

More Security Guards are required.

4.5.6 Water supply section:

For successful long term operation of any Zoological park, efficient planning and management of water has to be given high priority. The present water distribution mechanism of the Zoo needs to be further extended to the proposed enclosures to be constructed.

4.5.7 Power Supply section:

Regarding power supply, the work of renovation of the electrification network and further extension to the existing animal enclosures and to the additional land required to be taken up in future. Solar street lights as an alternative to electric power supply for further extension of the power supply network will be installed at selected locations at the administrative block and the Zoo premises.

4.5.8 Garden Section:

Staff strength: Gardner: 1

1. Presently it is being well managed. However, we need to increase the vegetation cover keeping the species of animals in mind.
2. The entire garden area will be redesigned with landscaping, to give it a fresh and new look.
3. Undulating large lawns shall be created with good quality grass.
4. The Garden would be enriched with greenery to support free living biodiversity.
5. Encouragement shall be given to grow quality seedlings of various varieties, in and around the animal enclosures and give motivation and pride to the employees.
6. Solid Waste Disposal area shall be more scientifically managed and Vermin – composting to be introduce

   More Gardener required.

4.5.9 Research and Study:

Junglemahal Zoological Park desires to conduct a number of research projects to assess biodiversity conservation, wildlife management, animal health issues and management of captive animals in the park. To ensure optimal outcomes collaboration with the number of organization will be given priority. The research teams will be made up of Veterinary College, Zoo veterinarians, collaborating scientists and students of graduate, post graduate and Ph.D levels. The research findings will further increase our expertise in the management of captive animals.

Staff strength: Nil

1. The Zoo shall meticulously record the detailed observations on the biological behaviour, population dynamics and veterinary care of the exhibited animals and develop a detail datasheet. The physical activities of

the zoo inhabitant animals, such as, infighting, inter group responses, feeding, mating and reproductive behaviour should be noted thoroughly.

2. There should be detailed record on new born animals, health of young animals including congenital abnormalities and mortalities. The Zoo shall share the collected data with renowned institution for developing different methods for increasing longevity, maintaining genetic diversity and behavioural viability, and enhancing reproductive potential of endangered species housed in zoo.

3. A detailed data regarding healthcare, nutrition and quantity of food provided to the zoo inhabitants, should be noted and updated on a regular basis.

4. The zoo shall keep recording data on water, electricity and other energy resources utilized in upkeeping and maintaining different animals. The data can be utilized for evolving strategies for optimum utilization of resources.

5. The zoo shall publish the data about ex-situ conservation techniques and scientific observations on relevant local/national/international journals.
6. The Zoo shall establish network with University and other institutions to carryout collaborative Research works on the important issues, on a regular basis.
7. Priority shall be given to the issues like Breeding, Artificial insemination, creation of gene bank, Stress – related studies, effect of enrichments on improving natural behaviour etc.
8. The Biologist / Researcher shall be provided with Computer / Internet facility and other basic requirements.

Future Proposals on Research Programmes

- Bacterial screening of faecal samples collected from different captive wild animals housed in Junglemahal Zoological Park.

4.5.10 Transport and Communication:

Staff strength: 01 Driver

Constraints in Transport and Communication

1. The major and immediate requirement is a Van for the Zoo. Other requirements include a vehicle for transporting solid waste, food.

2. High Speed Internet connection should be taken for the Library, Hospital and office.

Battery operated cars are required for physically challenged and aged visitors.

4.5.11 Visitor's Facilities:

1. More modernized toilets are to be set up keeping in view of the requirement to hygiene and fresh air. Toilets would be provided with the facility to take care of the needs of physically challenged people.
2. Trained Zoo Guides would be pressed into service, as added facility to visitors, to educate visitors.
3. All the existing drinking water points should be renovated with water purifiers.
4. Booklets and CD's on Animals of Zoo and on conservation aspects should be made available for people.
5. One Cloak room will be there near entrance gate.
6. More Visitor Shelter will be constructed.
7. Cafeteria will proposed to be made.
8. Child care room proposed to be constructed.
9. Children's park will be made.
10. Existing NIC will be developed more.
11. Proper directional and informative sinages with be installed.
12. A Parking area of 6400 Sqm will be developed before entry gate of the Zoo.

4.5.12 Disposal of Solid and Liquid Waste:

The only constraint in disposal of solid waste is transport of the garbage. This problem needs to be addressed by coordinating with the local Municipality. A waste management unit has been proposed to set up for daily organic waste management.

4.5.13 Future provision for development:

4.5.13.1 Library:

We have a plan to develop a library for resource materials, publication which will be accessible for the research work on captive management of zoo animals.

4.5.13.2 Nature Interpretation Centre:

A NIC is existing in the southern part of the Zoo and has been planned to develop more for public awareness and education programme.

4.5.13.3 Child care room proposed to be constructed in the extended area ofthe zoo within the zoo premises.

4.5.13.4 Restaurant:

Area for more restaurants for public is already available in the zoo premises.

4.5.13.5 Waste treatment plant:

A small unit of waste management has been planned to set up in extended partof zoo.

4.5.13.6 Incinerator:

An incinerator will be set up in the extended part for managing the properdisposal of animal body after necropsy.

4.5.13.7 Souvenir Shop:

A souvenir shop has been planned to open the zoo near main entrance of the zoo and the unit will be a theme based shop.

4.5.13.8 Animal adoption:

Animal adoption is one of the most promising programme for involving community in zoo animal conservation. We have monthly and annual adoption schemes of adoption of zoo animals and name of the adopter will be displayed in a prominent place.

4.5.13.9 Cloak room:

A cloak room has been planned to develop near entry gate for the convenience ofthe visitors.

4.5.13.10 Rescue Centre:

Rescue centre for wildlife play key role in animal welfare, nature

conservation and bio- diversity. The National Zoo Policy (1998), states that – "Zoos shall continue to function as rescue centers for orphaned wild animals, subject to the availability of appropriate housing and upkeep infrastructure".

A Rescue centre of an area of 2000 Sqm is proposed to be developed at the extreme west side of the park for primates especially, Monkeys and Langurs. The Rescue Centre can accommodate 17 nos. of individual at a time.

4.6 Constitution of Health Advisory Committee

As per the directives of the Central Zoo Authority, one Health Advisory Committee has been constituted (ref. 1106/1(9)/5M-85/2005(Pt.-2), dated. 07.03.2018).

Details of the Health Advisory Committee:-

Sl. No.	Name of the member	Designation
1	Joint Director, ARD IAH &VB (R&T) Belgachia, Kolkata-37	Chairman
2	Dr. Joyjit Mitra, Specialist (Sero-Epidemiology), RDDL(ER), IAH&VB Belgachia, Kolkata-37	Member
3	Dr. Debasish Chatterjee, Asst. Director, ARD (Vety), (Disease Investigation), IAH&VB Belgachia, Kolkata-37	Member
4	Dr. Proloy Mandal, Asst. Director, ARD (Vety), IAH&VB Belgachia, Kolkata-37	Member

4.7 Veterinary Section:

At present, the Veterinary section of the Zoo comprises of an animal treatment room, a post mortem room, a Rescue Centre and one quarantine for Herbivores and one for Carnivores. The rescue centre for primates

proposed to be demolished and will be reconstructed at the extreme west of the Zoological Park. It is hereby proposed to expand and upgrade the existing animal treatment room to a well equipped Veterinary Hospital, in consonance with Recognition of Zoo Rules, 2009 with (amendment) Rules, 2013.

Veterinary Section of the zoo is running by hiring consultant veterinary officer and required one fulltime Veterinary officer.

The proposed Veterinary hospital will have the following facilities:

- A separate operation theatre for surgery and treatment.
- An X-ray unit with dark room.
- A dispensary/pharmacy with storage facility for wide range of medicines.
- A nursery unit for hand rearing orphaned baby animals.
- A self contained laboratory for conducting pathological tests.
- Appropriate housing for indoor patients.
- Office, veterinary care reference library, record room, toilet.
- Tranquilizing equipments like dart gun, blow pipe and tranquilizing drugs.
- Sufficient number of squeeze cages and transportation cages for animals of different sizes.
- Quarantine/isolation wards for Herbivores**:** One Quarantine facility for Herbivores would be constructed near the Animal treatment room. The facility will have a feeding chamber/night shelter with top covered.
- Quarantine/isolation wards for Carnivores**:** One quarantine facility for Carnivores having three cubicles with squeeze facility will be constructed near the animal treatment Room, as depicted in the layout plan.
- Quarantine/isolation wards for Birds**:** One separate quarantine facility for Birds has been developed near the Animal treatment room. Presently this facility is being used for housing seized/rescued birds of various species.

- A Rescue centre of an area of 2000 Sqm is proposed to be developed at the extreme west side of the park. Where rescued primates, especially Monkeys and Langurs will be housed. The Rescue Centre

can accommodate 17 nos. of individual at a time.

- **Marking and tagging:**

Animal Tagging and Marking Plan

Mammals

1. Identification by natural marks such as photographs is well suited to large and complex body markings which have unique stripe or spot patterns.
2. Ear tags are suitable for herbivores with some limitations i.e. physical restraining during tagging may cause severe hazards and suitable anaesthetic agent for herbivores not available.
3. Micro chipping will be done in carnivores and elephant after procuring microchip and reader/transponder from appropriate supplier.

Birds

1. Leg Ring or Leg Bands are available in a large range of sizes to suit all birds and pheasants. They are manufactured from a range of materials the most common being plastic, aluminium and stainless steel.
2. Patagial tagging refers to the fitting of a plastic tag to the "patagium" or frontal flap of the skin to the wing of a bird and has been used worldwide with great success on a wide range of Birds species including vultures and condors, swans and eagles.
3. Neck Collar is a method of marking which is more suitable for birds with long necks such as geese and swans.

Reptilies

1. Visible Implant Elastomer (VIE) and Visible Implant Alpha Tags may be conveniently used for marking reptiles.
2. Ventral Scale Clipping for permanently marking snakes given by William Broen and William Parker 1976. It involves two features a) clipping ventral b) a serial enumeration system.

Electronic Transponders/ Microchips

The Microchips are biologically inert and do not need any batteries for charging. Standard subcutaneous injection of approximately 2mm to 13 mm microchip is quick and easy. A low energy radio signal is generated by the reader that will energize the chip to transmit its code. These codes are used as identification numbers. Time is measured in milliseconds at the receiving end.

The protocol for microchip is as follows:

1. The animal is restrained manually to avoid shaking and disturbance.
2. The mid-dorsal region between the shoulder blades is swabbed with 70% ethanol.
3. A microchip is implanted using a subcutaneous injection technique.
4. A Signal at receiving device is assessed to confirm the transponder's implantation.
5. Return the animal to its cage.

The device for the tagging is as follows:

IDT RFID Injectable tag (RFID Animal Identification Tag): TDT RFID Injectable tag is used suitable for monitoring, tracking and identification of pets, fishes, equines, livestock, wildlife and endangered species for health record keeping. They are thrusted through injectable applicator. These tags are fully compliant to ISO 11784/11785 animal ID standards. Tags are encapsulated in bio gloss which are impermeable and non toxic to the animals. The glass tag is laser sealed. The microchip is the size of a rice grain and implanted beneath the skin.

Staff requirement for Veterinary section:

The proposed staff requirement of this section is as follows:

- Veterinary officer: 1 no.
- Veterinary assistant: 1 no.
- Veterinary attendant: 1 no.

Engagement of Veterinary Officer would be on regular basis. One Veterinary Assistant has already been engaged during last financial year on contract basis. Existing Bansahayaks can be allotted the duties of Veterinary attendant.

The duties & responsibilities of the Veterinary section is presented in section 2.12.1

4.8 Zoo Education:

The key to wildlife conservation is environmental awareness and sustainable thinking, or the understanding that our environment is a fragile and dispensable place and that we must make educated decisions that do not cause negative consequences for current or future generations. It is imperative that the environment be protected and cared for to the best of our abilities and knowledge. Much of environmental awareness revolves around the educating of individuals about our environment itself, what problems exist, and what we can do to alleviate these issues. While there are dozens of environmental threats that impact our world today, some more than others have a direct effect on wildlife.

These environmental issues are all very serious concerns in the 21st century. They are all affecting our wildlife in different and often irreversible ways. The key to environmental awareness: education. If we are able to educate society regarding the negative impacts these issues have on our planet, we create a sense of understanding about the topic itself, and an urgency to help eradicate the situation as soon as possible.

Resource material and education information will be made available to the general public and zoo visitor. This will be leaflets, guidebooks, teachers' notes, resource packs and worksheets.

Today, when natural habitats are under severe stress and many species of wild animals have become endangered, zoos must not only maintain their own populations but also supplement the decreasing populations of endangered species in the wild. Zoos could serve as a platform for educating people about protecting habitat, ecosystems, and forests as well as sustaining the natural processes that support life because they receive a lot of visitors. Zoos that have been well planned and constructed can educate visitors about the perils of having a hostile or uncaring attitude towards nature. The main goal of creating a zoo education programme is to raise visitors' empathy and awareness of the importance of wildlife conservation and maintaining the ecological balance.

Zoos are an important source of cultural and educational information. When visiting a zoo, everyone should have the chance to observe and learn

about wildlife up close. The zoo will have a strategy in place for instructing both the general public and visitors. Through zoo, the Zoo Authority hopes to increase people's awareness of and appreciation for the natural environment. Visitors can learn about conservation through audio-visual tools, written instructional materials, and attractive and effective signage that explains the activities of various species.

Conservation Education Guidelines of Junglemahal Zoological Park is to bring together a diverse group of animal collections and the conservation education missions will be fulfilled in an equally diverse range of ways, depending on the type of resources, audiences, messages and with the available infrastructure. Junglemahal Zoological Park recognizes that the size of the collection will have an influence on the scale of the conservation education provision, and suggests that size and education provision should be in proportion.

We connect children and visitors of all ages to the wonder, awe, and excitement of the animal kingdom through innovative, hands-on programming and our nationally-recognized facility.

- Every enclosure in a zoo has a sign board displaying scientific information regarding the animals exhibited in it.
- Zoo is publishing leaflets, brochures and guidebooks and making the same available to the visitors, free of cost.
- Zoo has arrangements for recording, in writing, the detailed observations about the biological behaviour, population dynamics and veterinary care of the animals exhibited as per directions of the Central Zoo Authority. The database has been exchanged with other zoos as well as the Central Zoo Authority.

Education and Outreach Activity Extension Activities

The Junglemahal Zoological Park is in a close liaison with other Zoos of West Bengal and India to spread the messages of Conservation of Nature and Natural Resources.

- The central theme of the zoo education programme being the linkage between the survival of various species and protection of their natural habitat, enclosures which allow the animals to display natural behaviour are crucial to zoo education. The Master Layout Plan and Enclosures drawing and designs are made, therefore to display

animals in such enclosures only where the animals do not suffer physiological and psychological restraint.

- Attractive and effective signages and interactive displays have been prepared to explain activities of various species to visitors.
- For driving the conservation message, published education material and audio-visual devices methods are used.
- Formal education programme are also being organized for strengthening the education message by Understanding visitor motivation and When do they come to the zoo.
- Different days which are significant for wild animals are celebrated in Zoo. Schools and colleges are invited for participation in the programmes. Different programmes, e.g. sit-and-draw competition, quiz competitions, cultural programmes are planned for the participating students.
- Favourite animal in the zoo
- Zoos normally conducted interpretive programmes on lesser cats, turtle/ Tortoises, crocodiles and Birds and also have plan for making programme on other non charismatic creatures for making awareness among visitors about their importance in the ecosystem.
- Beside signage, the zoo also made a plan for guided tours, talks by knowledgeable persons and audio-visual shows for effectively communicating the message for conservation to the visitors.
- Junglemahal Zoological Park is in constant help of universities, colleges and non-governmental organisation to educate the students about the benefits of supporting nature conservation programmes.
- Junglemahal Zoological Park support environment friendly practices. Like ban of polythene bags inside the zoo. Such efforts are indirect interpretation methods to make visitors aware about the natural feeding habits of the animal and how polluting zoo with plastic could harm zoo animals.
- Zoo Website: Visitors could get detailed information on the zoo from the website. Junglemahal Zoological Park website is also a good source of providing information on health and safety of visitors during the zoo visit.
- Public conveniences: To make the zoo visit more exciting and comfortable for visitors Junglemahal Zoological Park offers basic facilities like toilet, drinking water, green spaces to rest, Child care

Centre etc. Junglemahal Zoological Park also provided enough dustbins so as to keep the area clean and hygienic.

- Zoo shop: Common merchandize which is available in Junglemahal Zoological Park shop includes T-shirts, brochures, badges, folders, caps, greeting cards, soft toys, stickers, key chains etc with Junglemahal Zoological Park logo, Mementoes. Other items include wildlife related handicrafts, book marks, pen stands etc.
- Visitors with Special Needs: zoo has made provisions for people with special needs. The Junglemahal Zoological Park has a plan to conduct special programme for differently-abled persons.
- Specific animal weeks (Tiger week, bear week):
- The entire week will be dedicated to a single species and all the programmes and activities will be thematically planned on the same. Free materials available from Zoo Outreach Organisation are used as educational resources.
- Programmes on non charismatic animals Library: Some of the zoos in India, organize species specific programmes, for example focussing on bats, bear, frogs etc. These are structured programmes mainly targeting student groups. Talks on the particular animal's habitat, ecology, conservation issues etc, games, distribution of materials (mask, rakhi's, hand outs etc.) are some activities designed for this type of programme.
- Programmes for colleges/universities: from veterinary, agriculture institutes, students from botany and zoology courses come to the zoo to carry out project works on various topics related to wildlife. Fine arts students are getting involved in designing signages in various zoos.
- Volunteer programmes: Junglemahal Zoological Park will have a plan to involve volunteer groups who provide their services during peak visitation seasons. zoo will train these volunteers to carry out educational programmes, guided tours, enclosure cleaning etc, on a regular basis, in most zoos volunteers are involved only during peak visitation season in carrying out activities during 'green' days, managing huge crowds and keeping a
- Programmes for General Public Students

- Animal birthdays: This concept of celebrating animal birthdays and thus popularizing the zoo is coming up in Junglemahal Zoological Park
- Guided tours: Request-based guided tour will be available in Junglemahal Zoological Park. Zoo guides, volunteers, education officers, curators, biological assistants, scientific officers are people who will be involved in this activity.
- Adopt an Animal: The programme of animal adoption in Junglemahal Zoological Park is not only a means to raise funds for the zoo but more and more people are positive about this idea and are showing their interests in adopting animals. This is a direct method to involve and sensitize visitors towards nature and wildlife.
- Zoo week: Junglemahal Zoological Park will have a plan to celebrate Zoo Week. Interactive activities, guided tours, slide shows etc. are some of the programmes to be carried out during this week.
- Animal feeding times: Since this kind of activity attracts lot of visitors and many Zoos are taking up this concept now, Junglemahal Zoological Park is making a plan to gather visitors in large numbers during animals feeding time, to be a part of this activity.
- Developing a Cadre of Volunteers.

4.9 Conservation Breeding

The Conservation Breeding Programme is a science of conserving a species by preventing imminent population collapse in the wild due to a large number of eliminative pressures (i.e. habitat loss, habitat fragmentation, industrialization, poaching, illegal trade and climate change etc.). The aim of the Conservation Breeding Programme is to conserve the genetic diversity of the species and restock or reintroduce the species to re-establish self sustaining population in its natural wild habitat.

Conservation breeding Programme of the Indian pangolin (*Manis crassicaudata*) in Junglemahal Zoological Park, Jhargram, West Bengal

1. Identification of species: Indian pangolin (*Manis crassicaudata*)

KINGDOM	Animalia
PHYLUM	Chordata
SUBPHYLUM	Vertebrata
CLASS	Mammalia
ORDER	Pholidota

FAMILY	Manidae (Gray 1827)
GENUS	Manis (Linnaeus 1758)
SPECIES	*Manis crassicaudata* (É. Geoffroy Saint-Hilaire 1803)

Indian pangolin (*Manis crassicaudata*) is one of the eight living species of pangolins of the world. Manis crassicaudata is a medium-sized mammal, with a streamline elongated body and tail covered with large overlapping scales. They are toothless mammals with 11–13 rows of large overlapping horny scales on the back, long protrusible tongue, and prehensile tail. A terminal scale is also present on the lower side of the tail of the Indian Pangolin.

Distribution and Habitat

Indian pangolin is widely distributed in India. Its range extends as far west as Pakistan, east to West Bengal (India) and Yunnan (Southwest China), south to Sri Lanka, and north to Nepal. The species has been reported from a variety of habitat types that include open grasslands, scrub and rain forests, and near human settlements (Zoological Survey of India 2002). In Pakistan Indian pangolins have been reported to prefer hilly terrains as compared to other habitat types (Roberts 1977).

Behaviour

Indian Pangolins are solitary, fossorial, nocturnal, and insectivorous. Predominantly terrestrial; however they have been reported to climb trees while chasing ants and inhabiting the canopy layer in tropical evergreen rain forests.

Food Habits

Pangolins are obligate myrmecophages foraging on eggs, young and adults of ants and termites with a preference for insect eggs over adults.

Reproduction

Limited information is available on the reproductive behaviour of Indian pangolins in the wild. Births have been known to occur in January, March, July, and November. Gestation is for 65-70 days. A single young is usually born, occasionally two. Newborns weigh 200-500 grams. At birth their

scales are soft, their eyes are functional, and they can crawl. At about 1 month old they can be carried on the base of their mother's tail when she is foraging. At about 3 months old they are weaned.

Threats & Conservation Status

Hunting and poaching for local consumptive use (e.g. as a protein source and traditional medicine) and international trade for its meat and scales in East and South East Asian countries, particularly China and Vietnam.

The species has been listed as endangered in the IUCN Red List of Threatened Species (Baillie et al. 2014); under the Schedule I of the Wildlife (Protection) Act 1972 of India and included in Appendix II of Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

2. Approximate number of animals of the species in the wild:

No estimate of population size is available for Indian pangolin. Currently this species is classified as Endangered (EN) and it numbers today are decreasing.

3. Number of animals of the species in captivity in Indian Zoos:

Zoo Name	Based on data made available by holding zoos			
	Male	Female	Unsexed	Total
Nandankanan Biological Park, Odisha	4	5	1	10

4. Identification of coordinating Zoos: Junglemahal Zoological Park, Jhargram,

5. Identification of participating Zoos: Surulia MinI Zoo, Purulia

6. Existence of animal enclosures in coordinating, participating and other Zoos.

i. Junglemahal Zoological Park, Jhargram Annexure: I (MLP) (Proposed)

ii. Surulia MinI Zoo, Purulia Annexure: II

7. Existence/ Creation of off-display animal enclosures for conservation breeding in coordinating Zoo.

Junglemahal Zoological Park, Jhargram Annexure: I (Animal Enclosure)

8. Identification of founders:

Acquisition of animals and their genetic study will be done for founders selection

9. Marking of founders (transponders, ear tags or rings)

Marking of founders will be done after selection of founders

10. Preparation of animal history sheets and animal observation sheets of the identified founders by the Zoos

Will be prepared as per CZA guidelines

11. Compilation of Studbook by the National Studbook Keeper

Will be complied

12. Liaison with the International Studbook Keeper of the species (if any)

Will be followed if required

13. Possibility of acquiring the founders from foreign Zoos (if required) and details of the Zoos from where founders can be acquired

Will be followed if required

14. Physical health check-up of the founders using the veterinary hospital in the Zoo as well as National Referral Centre (Indian Veterinary Research Institute, Bareilly)

Central Zoo Authority prescribed guidelines will be followed for health check-up of the founders.

15. Genetic health check-up of the founders using blood samples or body parts with help from LaCONES, Hyderabad

Central Zoo Authority prescribed guidelines will be followed for Genetic health check-up of the founders

16. Engagement of Technical Assistant in the coordinating Zoo

Will be done

17. Preparation of Conservation Breeding Management Plan (CBMP) of the species.

OBJECTIVES

i. Development of an ex-situ conservation facility for the Indian Pangolin in the Junglemahal Zoological Park, Jhargram.

ii. Isolation and characterization of novel microsatellite markers for the Indian Pangolin using Next Generation Sequencing approach.

iii. Monitoring and Screening of captive-bred Indian Pangolin.

iv. Sex determination of captive-bred Indian Pangolin.

v. Population assessment, conservation status survey, awareness, and engagement of stakeholders for conservation of Indian Pangolin.

vi. Acquisition and Ex-situ breeding followed by release into the wild.

Chapter V
PERSONNEL PLANNING

5.1 The zoo personnel

At present there are 21 staffs that form the work force of the Junglemahal Zoological Park. Divisional Forest Officer, Jhargram Division is the Ex-Officio Director of the the Junglemahal Zoological Park. All the 21 different category staff is engaged for carrying out housekeeping and zoo related activities under the control of the Divisional Forest Officer, Jhargram Division and Ex-Officio Director.

The majority of the zoo's employees are temporary workers. They have all developed the necessary expertise over time based on their experience and extended relationships with permanent employees and subject-matter specialists in these disciplines. Services of these casual workers need to be regularized. Some of them have been imparted training in specialized fields and some of them have been sent for training to other zoos.

The staff members receive specialized assignments based on their skills, disposition, and interests.

5.2 Staff recruitment

There is large scale recruitment requirement developed in various cadre of the zoo for which it is proposed to create and fill up these vacant posts either through contractual or permanent recruitment.

The arduous nature of work and specialized skill involved in various category of the zoo need to be considered as essential service and all such vacancies need to be filled up expeditiously by the West Bengal Zoo Authority. There are certain important and specialized jobs in the zoo management viz. animal management, sanitation inside the enclosures, and feed distribution for which no outsourcing desirable.

5.3 Work outsourcing

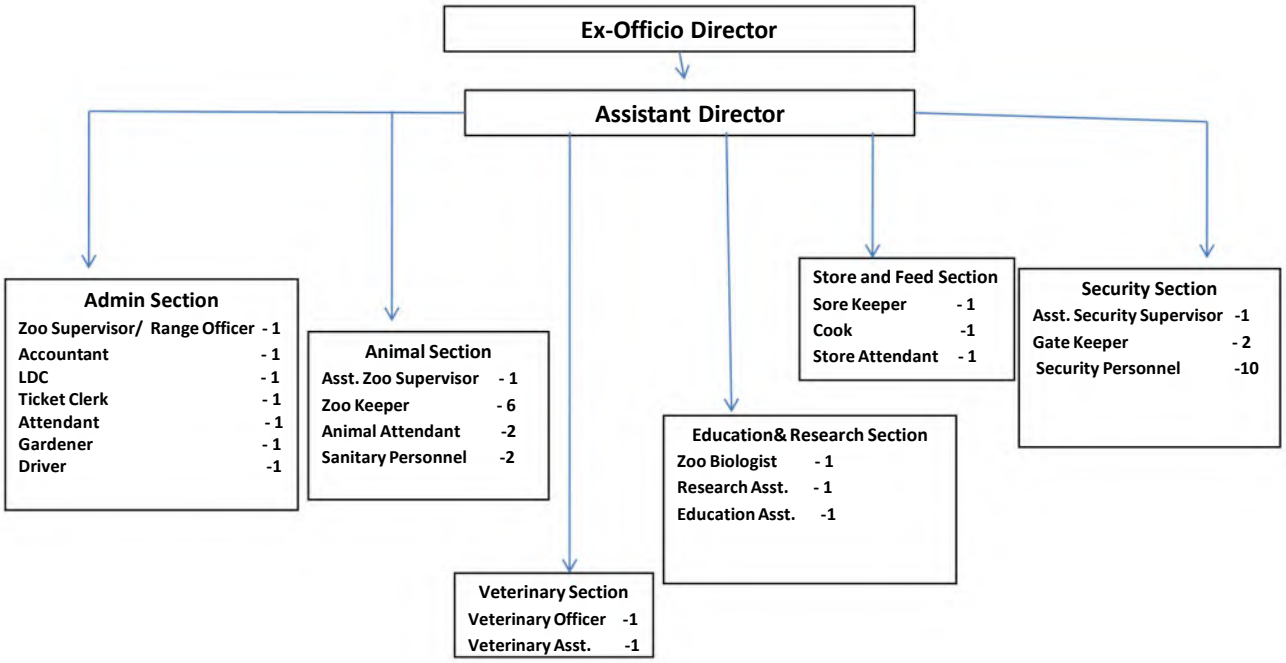
In the present condition it is better to execute certain works by outsourcing to service providers, private agencies or even credible NGOs who have desired expertise, skill and trained manpower. This would enhance the

capability of the management and would reduce botheration in terms of time and effort. Outsourcing of sanitation outside the enclosure area, parking area, security, food court etc. can be outsourced. Outsourcing of the nature shop, maintenance of electricity, lawns, gardens, toilets etc. can also be considered for a definite period of time.

5.4 Proposed Personnel Pattern of Junglemahal Zoological Park

Section	Name of the Post	Post Sanctioned	Post Filled-up	Proposed
Administrative Section	Ex-Officio Director	1	1	
	Zoo Supervisor	1	1	0
	Asst. Zoo Supervisor	2	0	2
	Lower Division Clerk	1	0	1
	Ticket Clerk	1	1	1
	Office Assistant	1	1	1
	Driver	1	0	1
	Research Assistant	1	0	1
Animal Section	Animal Supervisor/Section In charge	-	-	1
	Zoo Keeper	2	2	6
	Animal Attendent	10	3	7
Kitchen & Store Section	Store Keeper	0	0	1
	Store Attendant cum Cook	0	0	2
Veterinary Section	Veterinary Officer (Consultant)	1	0	1
	Veterinary Assistant	1	0	1
Sanitary Section	Sweeper	6	2	4
Garden Section	Garden Attendant	6	2	4
Security Section	Gate Keeper	0	0	2
	Security and Night Guard	12	9	3

Proposed staffing pattern and interaction planning



Chapter VI:
DISASTER MANAGEMENT

Fortunately, Junglemahal Zoological Park has so far not experienced any major disaster problems. However, the zoo should be always ready to meet any eventualities. The anticipated natural disaster includes fire, flood, cyclone etc. The anticipated man-made disaster includes fire incidence, civil disturbance etc. The staffs of Junglemahal Zoological Park not yet received any proper training on disaster management. Capacity building may enhance their ability and motivation level to combat the emergency situation results from disasters. The Junglemahal Zoological Park is procuring appropriate equipment and increasing trained manpower at present for disaster management. In order to enhance the capability of the staffs, they are proposed to be exposed to mock drills from time to time so that they would develop appropriate knowledge and skill to face various disasters in time. Trained and motivated staffs are to be kept in readiness round the clock to deal with problems in anticipating weather condition. The zoo may be closed for the visitors during the disaster period depending on the magnitude and emergency management service requirement.

6.1 Fire Control

Incidence of fire may be within the animal facility or other places within the zoo premises can be tackled by deploying the existing staff with additional external support. In case the fire is detected within the animal facility, the priority will be immediate removal of the animals to safer zone. The administration would utilize discretionary judgment on the spot to minimize response time. We will keep sufficient fire extinguishing facility in the administrative office, security room and zoo hospital to combat such eventuality. The water supply system for fire-fighting is presently included in the revised water pipeline layout plan. The roads are accessible to the Fire and Emergency Service Department vehicle and nearest to the enclosure. The powers supplies lines are proposed to equipped with electricity circuit breakers in case the fire or short-circuit of electricity supply line. Basic capacity building programme and mock drill for the staffs on fire-fighting is also practiced and there is always a scope to intensify the drills.

6.2 Flood / Water logging during heavy rainfall

Junglemahal Zoological Park was vulnerable to water logging during heavy rainfall in monsoon as the proper drainage system is under development. Presently the modified drainage system, land-shaping, highland development in enclosure and addition of mechanical system to drain out the water from the enclosures overcome the problem of temporary water logging. There is also a contingency plan for dealing with exigency associated with flood includes construction of an alternate water supply system and storage tank. As the existing water supply system may defunct during severe cyclonic flood situation thereby disrupting supply of safe drinking water to animal enclosures and staff barrack. The measures have to be taken to ensure uninterrupted supply of electricity in animal sections, security section and administrative block has already been taken.

6.3 Cyclone Situations

The Junglemahal Zoological Park is prone to cyclonic storms as seen during super cyclone Aila, Amphan, Yaash etc. To combat the situation in the aftermath of cyclone, the zoo has proposed to procure power chain saws to remove uprooted trees from the main and feeder routes. Further the generator back up supports to resumes electric supply and running electrical pump sets are also required within zoo premises. Water tankers, vehicles, stored food grains, search lights, generators will be procured or developed in near future to meet the exigencies. Agencies like West Bengal Fire and Emergency Service and West Bengal State Disaster Management Authority will be contacted to provide necessary help during the crisis.

6.4 Law and Order Breakdown

In case of civil disturbance, it is the first and foremost duty of zoo authorities to evacuate the visitors to safer areas in an organized way to avoid panic and stampede. An extra-wide emergency exit gate has been proposed to combat such situation. The zoo has proposed to install alarm system, public address system and two-way radio system for effective communication, minimize response time and to take effective measures. It is also proposed deploy additional private security to strengthen the

existing security system during peak season. The zoo has already proposed to install additional number of CCTV cameras in various strategic locations for 24x7 effective monitoring. Local police station and district administration will also be involved to deal with the situation and to ensure safety of the visitor and to restore peace.

6.5 Feed supply

In order to meet the exigencies, it is proposed to set up well managed in zoo store and kitchen facility. It is also proposed to keep extra meat (i.e buffalo meat) stock at least for a three days and live chicken can be stock in kitchen store. One large deep freezer with back-up generator facility needs to be installed for meeting the exigencies. Provision of electricity and water supply will be arranged in the facility. During strikes or agitation by workers and other staff, alternate arrangement for carrying out routine emergency zoo works are being ensured through service providers. The dry foods are being stored for one month in advance to meet the exigencies. A facility of green fodder has already been developed in the zoo premises by developing a vegetable garden and by planting fodder trees as part of greening activity to meet the regular and emergency supply.

6.6 Heat wave

In summer, the maximum temperature in the area rises about 40^0C - 45^0C. The zoo animals are vulnerable to heat waves experienced during summer months. The proposed contingency measures practiced in the zoo includes utilizing the existing water tanker with spraying facility, hand sprayers, providing straw thatching, coolers, ice blocks, anti-stress medicine etc. A team consisting of veterinary staffs, biologists and keepers need to be deployed during mid-day in pinch summer period with water sprayers, ice boxes, anti-stress drugs for immediate treatment of sick animals suffering due to heat wave. Elaborate summer arrangement need to be ensured well ahead of onset of summer special seasonal foods are also proposed to be provided to animals to reduce dehydration during summer months.

6.7 Cold wave

The minimum temperature in the area falls around 10^0C in month of January. Tomitigate cold waves during winter months, winter arrangements need to be proposed to procure in Junlemahal. This includes providing

protective netlon coverings around bird enclosures, electric bulb in enclosures, infrared lamps and heat chambers in proposed reptile house, blankets wrapped with straw to proposed reptiles and primate enclosures. Special seasonal foods are also being provided to animals as nutritional supplements.

6.8 Linkages with others

The linkages of the zoo management with other line departments and agencies for managing the disasters viz the police, district administration, disaster management team, fire brigade, credible NGOs, hospitals and other experts willbe of definite help during emergency and disaster periods.

6.9 Line of Command and SOP

In order to facilitate rescue and rehabilitation activities during disasters, there should be proper line of command. The role of administration needs to be clearly defined so that the event of absence of any officer, proper line of command would be maintained. A SOP will be developed for effective disaster management and to act during emergency situation.

6.10 Training and Capacity building

Officers, keepers and other staffs at grass root level are capable but not yet received any proper training to work efficiently during disasters. Capacity building may enhance the ability and motivation level of staff to combat disasters.

6.11 Mock drills

A schedule and protocol for conducting mock drills for first aid, emergency situations

In the Junglemahal Zoological Park, emergency procedure training is regularly conducted for the workers. The institution's staff is trained in emergency drills to make sure they are aware of their roles and responsibilities as well as how to respond appropriately in an emergency. Sessions on safety awareness should emphasise individual accountability for a safe and secure workplace, situational awareness during routine operations and emergencies, personal fitness, basic communication skills, and other elements needed for a safe working environment.

- It has been planned to undertake training and preparations for animal escapes through classroom instruction and drills that are scheduled for multiple times per year (at least once per quarter).
- To enable the zoo's management to assess whether all staff are aware of emergency procedures and to identify potential problem areas, emergency drills will be conducted at least once every quarter for one of the basic types of emergency (fire, weather/environment, injury to staff or a visitor, animal escape).
- For seasonal or temporary guest services workers who operate in cafés and parking lots, as well as maintenance staff and horticultural staff, classroom training will be given utilising an interactive PowerPoint presentation.
- Employee responses and response times will be evaluated right away following each drill in order to make any necessary adjustments to response protocols and ensure the best possible response during a genuine crisis.
- Supervisors will be in charge of conducting follow-up inspections to ensure adherence to safety measures.
- To make sure that protocols are being followed, that staff training is effective, and that what is learnt is then applied to fix and/or improve the zoo's emergency procedures, these exercises will be documented and assessed.
- Improvements to the procedures shall be appropriately indicated in the records of these exercises, and regulatory bodies may review these records.

1. **Fire Drills**

There will be at least yearly fire drills.

• Keepers and security personnel will need to be aware of their obligations in every circumstance.

• Keepers' responses during drills will be quite similar to their reactions during a genuine emergency. • Keepers and security staffs are responsible for counting the people who evacuate and assemble in a designated place or to help direct fire engines coming in through a nearby perimeter gate.

Treat every practise as if it were an actual emergency.

2. Human Injury Drills

For first aid and other different health issues involving personnel or visitors, the zoo will have a written plan that is accessible to all workers. The contingency plan must to list all certified first responders employed by the zoo along with the local ambulance, police, and other emergency numbers.

Each member of the Zoo staff should be aware of their specific duties when stabilising and assisting someone who has been hurt. Each facility will conduct annual human injury drills, with keepers' roles being practised during these drills.

The human injury drills that take place in a zoo setting are highly intriguing since they might include a wide range of situations or emergency methods. Keepers may anticipate multiple injuries when the "escapee" attacks and hurts more and more people if the injury drills are conducted alongside an animal escape drill. Keepers can hone their roles as vital members of the response team for their institution by participating in these kinds of realistic drills.

Generally speaking, the animal collection has to be protected from any weather.

Snowstorms, heat waves, hurricanes, tornadoes, ice and wind storms, and flooding are all hazards that need to be avoided by all animals.

What a keeper does

The first step is to look up his or her responsibilities in the emergency procedure document for the zoo.

The second goal is to constantly assure the highest level of animal welfare.

This implies that keepers should monitor the weather as closely as leadership does and make sure the zoo's infrastructure and life support systems are in good operating order. If keepers are worried about a facility or system breakdown that could endanger the lives of the animals in their care, they must alert supervisors and other keepers in advance of impending weather.

3. Weather emergency Drill

Because it is so difficult to successfully practise for weather catastrophes, the zoo will do "tabletop exercises" instead. Simply put, a "tabletop" is a comprehensive planning exercise in which all relevant personnel

sequentially verify roles and responsibilities for the crisis response plan, personnel readiness, and crisis management while going through the crisis response plan (often with a large facility map on the table in front of them).
The zoo's emergency plan includes flooding and cyclones/windstorms and will outline departmental and personal roles and duties. The zoo's management thought that it would be a good idea to have an evaluation/readjustment exercise for all staff members and a "tabletop (planning) exercise" for all staff members each year a few months before the flood and windstorm season.
The responsibility of the keepers in this situation is to ensure the integrity of their exhibit spaces (for example, by keeping animals indoors and inspecting the area's general security before the storm) and to notify supervisors of any issues at least two months prior to the windstorm season.
The zoo feels ready, and each member in the room has a specific role and responsibility in the weather event. The zoo evaluates keeper responsibilities and preparation on a weekly basis to make sure everyone is prepared as the windy season approaches; this is an extension of the tabletop.

Animal-Human Incidents

Unauthorised visitors in exhibits and unexpected animal-human encounter are examples of animal-human incidents.
Additionally, appropriate protocols will be in place to handle an attack that causes an injury. According to the criteria of the emergency drill at the zoo or aquarium, these measures will be routinely practised. Every time there are injuries, the institution is required by law to prepare and keep on file a written report detailing the circumstances leading up to the incident, how the injuries were treated, and any modifications that were made to the facility's safety procedures as a result.

4. Evacuation Drills

A quarterly evacuation drill will be held at the zoo.
A copy of the zoo's emergency manual, detailing area protocols, and an up-to-date list of the zoo's emergency phone numbers can be kept at home or in a cell phone by the zoo's keepers, security personnel, and other departments. Anytime could be a good opportunity to use this knowledge.

5. Animal Escape Drills

Animal escape exercises will be carried out to train zoo workers on a quarterly basis, just as other drills. Staff should receive training on the animal escape emergency response procedure before participating in practise drills that are publicly publicised. The zoo's management should conduct surprise drills only after it has tested the staff members' actual response times and skills.

Additionally, visitors must be "evacuated" or "sheltered in place" from the escaped wild animal.

6.12 Proposed Equipment Procurement for Dealing with the Disaster

Some of the basic preparedness includes keeping essential equipment and materials mentioned below,

(i) Alarm system

(ii) Public address system

(iii) Radio communication

(iv) Rubber boots

(v) Helmets

(vi) Shovels

(vii) Pick-Axe

(viii) Welding cutting machine and gas cutter

(ix) Portable chain saw

(x) Portable generator

(xi) Portable pumping set

(xii) Ropes & nets

(xiii) Portable cages

(xiv) Construction material

(xv) Chain link, angles, clamps, iron rods and cement

(xvi) Tractor-trolley and portable earth removing equipment

(xvii) Fire-proof dress and goggles

(xix) Wooden planks & bamboos

Chapter VII:
CONTINGENCY PLAN

7.1 Rescue of animals from wild

Junglemahal Zoological Park presently does not have any facility for rescued wild animal and but it has scope to act as a rescue and treatment centre for wild injured and orphaned animals. The rescued animals may be released in the wild after necessary treatment after keeping some time in quarantine if those animals are physically sound and suitable for rehabilitation in the wild. If the rescued animal required to be permanently displayed then it would be housed in quarantine area for a specific period before put to public display.

The following actions need to be initiated for handling the rescued animals.

7.1.1 Trap cages

In order to transfer problematic animal sufficient number of trap cages for different species are to be kept ready in zoo at any point of time. Trap cages are also to be kept ready which would also serve the purpose of temporary housing and transit of the rescued captured animals.

7.1.2 Vehicles

At present, no pick-up van is available in the zoo for attending animal transfer, rescue operations or small animal transport. However specialized rescue vehicle filled with required infrastructure is needed.

7.1.3 Tranquilizing equipment and chemicals

It is proposed to train the zoo staffs and rescue team members to use the tranquilization equipment and chemicals to handle to problematic animal for immediate treatment or escape animal for safety of animal and visitors. It is also proposed to store the equipment is main administrative building for authorized access.

7.2 Escape of animals from enclosures

At present zoo has boundary wall completely around the zoo premises. The zoo staffs routinely check all the perimeter chain link fence of animal enclosures. Utmost care is being given for safety of the public inside the zoo during park hours. At present zoo is proposing to increase night security guard to conduct routine checking of all enclosures during night hours and

early morning to prevent any escape of captive animals. The zoo already proposed to procure and install more CCTV camera with night vision facility in enclosure, night shelters and other strategic locations.

Escape of zoo animals is sudden and creates emergency situations to tackle immediately. If the situation arises during zoo hours when visitors are in large number, the immediate job is to cordon of the area so as not to allow any visitors to approach the escaped zoo animal. Then to use the alarm system of the zoo to alert all staff including security. The proposed Rapid Response Team need to be kept ready immediately to capture the escaped animal either through trapping or through tranquilization. For this the tranquilization equipment need to be kept ready at zoo office. All responsible staff of the zoo must keep the telephone numbers of rapid response team members and other key persons. In case of emergency, the police, fire brigade, ambulance to be contacted over telephone and the required telephone numbers to be displayed at zoo hospital, administrative building, security kiosk and offices. One vehicle along with driver need to be kept ready to meet emergencies. The trap cages, tranquilising equipment and nets are to be also kept ready with lock & key with designated officers.

For warning people & staff about emergencies

In emergency situation viz, escape of large cats, fire, law & order situation etc. there is a for proper evacuation mechanism in the zoo. For this the zoo has alarm system and public address system in the administrative building, entry/exit gate. It is highly prioritised to arrange fixed station and walkie-talkie (Radio communication) in the zoo.

The following safety measures proposed to be taken to prevent escape of animals from enclosures:

i) Escape drills conducted periodically among zoo staff to keep them more vigilant and well groomed.

ii) Periodical trimming of trees is being carried out both inside and outside enclosure close to fence so as to avoid falling of branches which may serve as an escape route for capture animals viz carnivores, primates and reptiles.

iii) Moat water level is being maintained within the safety limit so that the captive animals who are good at swimming unable to cross the barriers.
iv) Repair and maintenance of doors, windows and annual painting of chain link mesh fence is being done to prevent rusting.
v) The animal keepers, animal attendants and co-workers are sensitized during training and other interaction to prevent and deal with the issues of animal escape.
vi) The stand of barrier and enclosures are meticulously designed so as to maintain the safety of visitors.

Use of tranquilization gun and techniques of chemical restraint.

This is a very useful technique to capture problematic wild animals and zoo animals in distress so as to give them specific treatment. This can be an effective method for capture-recapture, translocation, reintroduction, hormonal implant for undertaking research studies. This is a very skilled and specialized job as one has to know about immobilization system, the drugs, darts, use of tranquilizing equipment etc. The drug doses vary and so also the kind of drug from wild carnivores to wild herbivores. Various capture techniques should be imparted to staff and practiced by a specific group within the zoo.

Rapid Response Team

In order to tackle the problem of escape of animals from enclosures, one rapid response unit comprising higher officials, biologist, veterinary team, and concerned animal keeper is being constituted. Necessary trap cages, nets, tranquilization equipment and drugs are being kept ready to start trapping the escaped animal. Simultaneously evacuation mechanism of visitors is being taken up.

7.3 Monkey and Dog menace

The Junglemahal Zoological Park has no such problems but the staffs are always keeping a close watch to the safety of animal and their feed to overcome the sudden problem of stray animals. The zoo premises are surrounded by boundary wall and protected from stray dogs.

7.4 Arrangement of animal feed in case of strike (non-supply by contractors)

We have proposed to store different feed items to tide over contingency situations such as strike periods by staff, strikes called by various political parties, non-supply of the feed contractors, natural calamities as uninterrupted supply of feed need to be considered much ahead of the real situations. All dry feed needs to be kept ready in well maintained storage facilities at least for fifteen days. Similarly perishable food items like fruits and green items to be procured and stored departmentally for atleast three days without banking upon the feed contractor. Apart from this a fodder farm and a vegetable garden is developing in the zoo for self-dependency. Presently the zoo does not have deep-freezing facilities. This will be proposed to procure to store perishable food items including buffalo meat, chicken and eggs at least for a week. Day old chick, white mice etc. might be kept ready at least for a week. We are also proposing to develop a mice and insect breeding centre near store area for reptiles. The natural water bodies in different zones also have sufficient numbers of fishes as feed. Identification of service providers to be done much ahead to take their help to tide over the problems.

7.5 Snake bite

Junglemahal Zoological Park abounds with variety of snakes due to its natural vegetation and habitat conditions. There are free living poisonous snakes inside or outskirts of the campus. Moreover, many poisonous snakes will be exhibited in proposed Reptile Section. The animal keeper who are working in reptile section are vulnerable to snake bite. The bite proof gloves and other necessary instruments will be procured. It is proposed to keep sufficient doses of anti-venom serum in zoo hospital to meet any emergency situation and also a communication should be established with nearest hospital for availability of AVS. More than one number of well-maintained first-aid boxes are being kept ready at zoo. The zoo keepers need to be trained for first-aid measures to be taken immediately in case of snake bite. Tetanus and antivenom injections need to be procuring for emergency uses in the zoo hospital. Always a special care is taken for animal enclosures to make it free from rodents, snakes etc.

7.6 Visitors getting injured/ visitors falling inside enclosure & First-Aid facility

Junglemahal Zoological Park attracts a good number of visitors every year. In case of some accident, visitor falling inside the enclosure, animal attack, snake bite or any sort of injury the zoo need to be equipped with first-aid kits at various points. In case some visitors fall into enclosure or wet/dry moat, there is telescopic aluminium ladder and rope require to be procured and available in administrative office for rescuing. Animal keepers and security staff will be deployed on rotation to meet such situation. The rapid response team members will be engaged to meet any such untoward incidence in the zoo. Proper stand-off barriers to be erected to avoid falling of visitors to any enclosure moat.

Proper do's and don'ts signages are already been fixed in important zones to sensitize the visitors. The minor injury can be treated with first-aid facility. First-Aid facilities need to be available in the zoo for minor injuries of visitors at different points like administrative office, entry gate, security room etc. However, in case of serious injury, arrangement to be made for taking the injured visitors to nearest hospital by the vehicles available in the zoo.

7.7 Fighting among animals

Infighting usually noticed during rutting season of deer and antelopes among males. Similarly fighting occurs among carnivores, primates, crocodiles. In this case the fighting animals in case of carnivores one to be driven back to night shelter to avoid injury. Animal Keepers need to be been trained in this regard so that they can separate the fighting animals. Occasional fighting occurs between mating pairs of carnivores for which their attitude and mating behaviour, acceptability of the partner to be watched carefully before allowing them to actual start of mating. Preferably zoo vets are to be kept standby with drugs and tranquilization equipment near kraal where mating of large carnivores is allowed.

7.8 Epidemics

In case of any epidemic or communicable disease, the zoo will take proper sanitization measures like arial spray of anti-viral or anti-biotic medicines in case of avian influenza, and the zoo has a well-planned master layout

describing isolation units, quarantine section and incineration site for disposal of dead animals etc. The zoo needs a well trained and experienced veterinary team maintains regular schedule of vaccination, deworming and regular health monitoring. Outbreak of communicable diseases viz. Anthrax, Foot & mouth
disease, Haemoragicsepticemia, avian influenza etc. creates serious threat to captive animals in the zoo. The stray dogs and pet cats are also potential sources of diseases viz. Ehrlichosis, Feline Panleucopenia for which vaccination protocol is being taken up in the zoo. In order to prevent source of infection from fodder grass which were brought from outside has to be minimise and captive fodder farm in the zoo has been upgraded for sustainable supply of quality fodder for zoo herbivores. The zoo veterinarians meticulously do the quality check of animal feed to prevent spread of any diseases to zoo animals.

7.9 Breakdown of power supply

In case of breakdown of power supply, the zoo has already developed alternate power supply for supply of water through pump sets, CCTV operation, keep live energized fence, power supply in enclosures through Diesel Generator and Solar Power etc. Sufficient fuel is kept ready at any point of time to run all generators and pump sets in the park. Inverters have to be provided to administrative office, zoo hospital, ticket booking counter and zoo hospital. Solar street lights need to be fixed at entry point, fodder farm, gate, administrative section. Solar home-light system may be provided to zoo hospital, administrative office and officers' quarters.

7.10 Free ranging animals/Feral animal menace

The zoo has a good number of avifauna, butterflies, few snakes etc as free ranging animal. There is also evidence of presence of rodents, mongoose in the zoo. The zoo has trained staff for pest control. The rodent trap and repellent are also proposed to use at regular intervals in different locations in zoo premises. The animal feeds are stored in concreted store house with proper precautions to avoid the problem of rodents. Animal enclosures are maintained, cleaned and checked every day with full attention to avoid any feral animal menace.

Chapter VIII:
CAPACITY BUILDING

Skilled and knowledgeable personnel are essential to maintain and up-keep Zoo. As time changes the new challenges will emerge and the staff is required to upgrade their skills and potential to handle any eventualities. Capacity Building of different category of office staff and frontline personnel is very essential for better care of animals, providing better nature education and smooth function of the zoo.

8.1 In-house training

A cursory look at the history and growth of zoo does indicate the efficient functioning of the zoo with available competent and experience staff. Skills acquired are getting transferred to next generation. Documentation and regular demonstration of the skills and knowledge acquired has to be done on regular basis. Therefore, it is proposed to organize training sessions with experienced people for the benefit of staffs. A group of junior staffs would be attached to such senior staff for some time, so that all the fine skills of animal handling and care could be learnt "on job". Also, working in groups fosters team spirit and brings out the best of the ordinary, which is the modus operandi of modern corporate work.

8.2 On the Job training:

(a) Collection of biological material & their interpretation

The zoo staff especially those who are working in veterinary wing must be trained to collect biological material and to examine and interpret as and when required.

(b) Necropsy and other wildlife health care

Often zoo management found themselves in a bewildering state and any sudden break out of any epidemics viz. anthrax, tuberculosis, foot & mouth diseases, avian influenza. The local disease investigation unit of State Veterinary Department needs to be involved in this regard. Therefore, the zoo staff should be involved in cooperative effort taken by local veterinarian in post-mortem, collection of samples of vital organs for histo-pathological viral and bacterial examinations, their preservation and dispatch, signs & symptoms of common wildlife diseases, external indicators of health to be used for gross periodic health assessment. This sort of training should be repeated at regular interval to make the practice more perfect. The help of State Government Veterinary Department is

being taken. Further the blood samples of both zoo animals must be sent to authorize laboratory for testing.

(c) Use of computers internet and related accessories

A few staff may be trained in order to handle computer internet and such accessories. Knowledge on GIS technique & remote sensing would be very essential in today's world which would be a very handy management tool. Various field data can be analyzed, stored and retrieved giving zoo management an update status.

8.3 Formal training courses

The officers need to attend various training programmes organized by WBZA and CZA from time to time including the training for zoo veterinarians. Different funded training and capacity development programme will be organized for zoo keepers and animal attendants at Junglemahal Zoological Park. The training modules include animal care, education & outreach, veterinary expertise, management etc.

8.4 Encourage specializations

The Junglemahal Zoological Park acts as a Rescue & Rearing Centre for all problematic, orphaned and injured animals of nearby districts. In order to meet the exigencies one anti-depredation and rescue unit will be set up at Junglemahal Zoological Park in future. The zoo staff both at field and official level will participate in multipurpose training course in the country for specialization in the field of animal health care, zoo keeping, environmental enrichment, zoo education and interpretation, conservation breeding programme etc.

8.5 Annual rewards

In recognition of commendable performance in the field of zoo keeping, rearing of orphaned and injured/sick animals, gardening, security, maintenance etc. the dedicated staff are being rewarded on the eve of Zoo Foundation Day, Wildlife Week, Birth Day of animals, Zoo Keepers Day etc. The best maintained enclosures are also being awarded.

8.6 Recreation/Relaxation

In order to inculcate a feeling of togetherness and homeliness, it is proposed to set up an interactive and counselling centre. In order to encourage the zoo personnel to show their inherent hidden talents, cultural evening, sports, get together organized. All the subordinate staff and zoo officials must have a family bonding to take the zoo to new heights. The zoo management should take all compassionate measures to encash a feeling of brotherhood so that there will be no agitation or grievance by the subordinate staff.

8.7 Training of officials

The Zoo Director, Biologist, Veterinary Officers must attend specialized training courses so as to gain up to date knowledge on the relevant field which can be applied in our zoo.

8.8 Plan to upgrade skills of zoo staff

There is urgent need to train the existing staff to upgrade their skill in various aspect of zoo management from time to time. This will help the management for smooth running of the park.

8.9 Interaction with other Zoos:

Regional, National and International co-operation

It is desirable to have interaction with other nearby zoos for regional cooperation in planned conservation breeding of endangered species. There is also a need of regular knowledge exchange programme or interaction with the nearby zoos.

Chapter IX:
E-GOVERNANCE

Application of information and communication technology for dissemination of accurate information, exchange of information and interaction with other zoos and organizations, maintenance of records and data in digital format would help the zoo to reach out the stakeholders and clients. Junglemahal Zoological Park has planned use of significant advances in Information Technology sector and has planned to put in lot of efforts to computerize in all aspects to make fast, accurate and paperless office and to store the required data for better management.

Conservation education is one of the important objectives of Zoo. The available technologies such as internet, website hosting, e-mail, digital photography, all helped the zoo to reach out to many print and electronic mass media agencies with little expense in real time.

9.1 GIS Mapping

Using the GPS and satellite imagery the following maps will be prepare for Junglemahal Zoological Park:

- Location and access of Junglemahal Zoological Park
- Green zone and fodder zone and vegetation type by density
- ClassesMap of existing waterholes in Junglemahal Zoological Park
- Administrative map showing blocks, compartments and sections
- Enclosures, visitor pathways, other attractions in the zoo premises
- Management plan showing proposed facilities in Junglemahal Zoological Park

Apart from the existing mapping system, all the enclosures, infrastructures, internal roads etc. will be mapped with the help of GPS and satellite imagery. It is proposed also to map the electric power supply lines, water supply system, drainage system etc.

9.2 Entrance Gate

This is most important point from the point of crowd regulation and revenue realization. The entrance tickets issued to the visitors will be computerized with facilities to monitor the flow of visitors and amount realized. The details can be viewed by the Administrator end in real time thus preventing any loss and the details can be stored in Director's computer system reducing the use of book ledgers. This facility will enable accuracy, efficiency and transparency. There will be different layers of scrutiny and supervision over the entry of visitors with valid tickets. Ticket

issuing will be outsourced to reputed agency with clearly defined functions and facilities to be provided. Security will allow the visitors after ensuring valid tickets. A permanent staff will be kept a watch on ticket issuing. The authority could monitor the movement of visitor and issue of tickets from their chambers.

9.3 E-ticketing & E-commerce facility

Due to expected phenomenon growth in visitors, it is planned to integrate E-ticketing with the upcoming website of Zoo. With the help of our bankers, E-ticketing will be put in place in near future, thus reducing the long queue and rush near the entrance gate. A reputed company will be employed for integrating e-ticketing and adoption payment through the website. Setting up payment gateway service using credit card, debit card etc.

9.4 Close Circuit Cameras with TV monitors

Junglemahal Zoological Park is expecting remarkable foot falls in coming years with annual growth 50% visitors' increase. Coupled with multitude of educational and other learning programs, the security and surveillance for the safety of animals, visitors and property, it is inevitable to have different layers of security system in place. CCTV's have become very handy to monitor the movement of crowd and keep an eye on vandalism and theft on busy crowded weekends and festivals. Junglemahal Zoological Park is steadily increasing the number of CCTV's to have continuous monitoring and to take collective steps in day to day behaviour of sensitive animals, sick animals and movement of unauthorized persons and to detect the vandalism and thefts, so as to alert the security system. At present there are one monitoring units in the chambers of Director with Close Circuit Cameras installed at different strategic points. It is proposed to install more cameras at sensitive points for visitors' management, animal care in enclosures, kraals, night shelters.

9.5 Wireless Network

Junglemahal Zoological Park needs an effective wireless network system with handsets, which will be provided to the security personnel stationed at strategic points. The Security Officer will monitor and collect the information at a regular interval throughout the day and several times. It helps to work efficiently to prevent major mishaps and to take corrective

steps. The security unit will be in constant touch with Director or any authorised person and reports immediately any incident of significance.

9.6 Media management

Photographs of new born animals, press release on new acquisition, training camps and any other development related to Zoo will be communicated to both print and electronic media through e-mail attached with digital format to large number of agencies and media channels. This would help the Zoo to reach out to large public and would attract crowds with little expense in real time. Correct and factual reporting of happenings in the Zoo will help us to maintain transparency and credibility. Also the message of conservation education and importance of captive breeding & its significance could be effectively communicated to general public and animal lovers in particular. Animal adoption is mainly due to the positive coverage in the media, so the available technology must be utilized effectively.

9.7 Zoo Official Website and Email

A new official website will be launched with a modern design and advanced features targeted at large, worldwide audience of animal lovers, nature conservators, tourists and children of all ages with a budding interest for the animal world. The new website will be designed and hosted with the assistance of a reputed web management agency. The website is user friendly and covers all the sections with historical background with attractive photo feature section on the existing animals. The website will be constantly updated with the latest information, happenings, animal acquisitions and any issue related to Zoo.

9.8 Introduction of online + POS facilities to website maintenance

Junglemahal Zoological Park has a plan to introduce the Point of Sales facilities for facilitating the visitors to use their VISA card and Master Card for payment of entrance fee / donations / sponsoring towards animal adoption scheme and other official remittances to the zoo.

9.9 Electronic transfer of the amount

Junglemahal Zoological Park will also facilitate visitors for electronic transfer

of the amount from their place to the Zoo account in nationalised or scheduled Bank, towards animal adoption / donation and also availing concession for school students.

9.10 Procurement of works/ goods/ miscellaneous services through tenders on E- Procurement Platform of Government of West Bengal

According to Government of West Bengal advisory, all tenders for procurement of works, goods and services are being processed through e-portal and achieving transparency in procurement.

9.11 Computerization of office work

Presently there are two computers installed in the zoo and these are being used for generation of reports, communication of office orders, accounting, exchanging information with other organizations and storing useful data. There is need for networking all the computers by LAN.

Realizing the need for exposure and training, the concerned staff members will be trained at various Institutions so that they become capable of utilizing the advanced software.

9.12 Maintenance of Accounts and office records

Junglemahal Zoological Park is a unit of 'West Bengal Zoo Authority'. It is mandatory on the part of registered societies to present Balance Sheet, at the end of the year, giving a true and fair view of the state of affairs of the Society and Income & Expenditure Account giving true and fair view of the excess of Income-over-Expenditure or excess of Expenditure-over-Income of the Society. It is also statutory requirement to get the accounts audited by a Chartered Accountant.

Junglemahal Zoological Park will acquire efficient and user-friendly software for monthly pay bill preparation, updating and maintaining daily, monthly & annual accounts. An account is being kept updated constantly and both revenue and expenditure is reconciled daily with advanced tally software package. Executive Director could keep a check on both revenue & expenditure against the budgeted amount at any point of time in real time.

In the stores, the feeding articles weight measurement is computerized to achieve accuracy and transparency.

9.13 Hospital Computerization

Separate computers will be provided to doctors apart from general computer, wherein all reports pertain to animal inventory, data entry and reports will be generated. Internet facility will be provided to proposed hospital unit to keep in touch with other counter parts for exchange of information and recent advances in animal health management.

The following activities will be computerized:

1. With chemicals management software, updating of all information will be done daily.
2. Data documentation with regard to mortality, natality, acquisition and disposals.

9.14 Animal Data Management

The existing maintenance of animal history records is maintained in zoo in traditional record keeping method. Although many information including stud-book, animal health card, inventory etc. have been computerized yet there is need for further up-gradation in view of many advance records keeping and information sharing system. We intend to take membership of the ZIMS (Zoological Information Management System). The ZIMS is comprehensive software, consisting of the following, in addition to other features

ARKS- Animal Record keeping System
Med ARKS - Medical Animal Record Keeping System
SPARKS - Single Population Animal Records System

The Zoo Information including animals, education & outreach, revenue, medical will be uploaded in Integrated Management Information System of West Bengal Zoo Authority and IMIS facilities of CZA as part of e-Governance.

This could help exchange of information about zoo activities and Animal Status and animal exchange programme.

We are converting our zoo office to an e-office in near future and all the information will be enter, updated, uploaded, shared only through dedicated software and application system.

Chapter X:
BUDGET

10.1 Broad Budget Analysis for Implementing the Plan

The plan period of the Master Plan of Junglemahal Zoological Park is for 20 years starting from 2024-25 to 2044-45. The zoo expected a recorded highest foot falls i.e. 1-1.5 million per year. It is also one of the newest zoos in the country having housed exotic and endemic species. The zoo is located in midst of developed urban landscape. It has got very good basic infrastructure in place. However, considering suggestions of technical experts of Central Zoo Authority and West Bengal Zoo Authority, it is proposed to change the existing layout plan by adopting the different themes. Number of animals proposed to be displayed has also varies from different ecosystem and biogeographical realms. At present zoo does not have separate Rescue and Rehabilitation Centre. As per suggestions of the experts, it is also proposed to develop an rescue, rehabilitation and captive breeding centre. Considering the above, the budget required is derived based on the current prices.

Year Wise Budget (Non Plan)

Sl. No.	Particulars	Amount (Rs.) 2025-26	Amount (Rs.) 2026-27	Amount (Rs.) 2027-28	Amount (Rs.) 2028-29	Amount (Rs.) 2029-30
1.	Annual establishment charges (salary, incentive, uniform, security, statutory payments etc.)	80,00000	88,00000	96,80,000	1,06,48,000	1,17,12,800
2.	Feed & Fodder	80,00000	88,00000	96,80,000	1,06,48,000	1,17,12,800
3.	Annual outreach and education programme	10,00000	11,00000	12,10,000	13,31,000	14,64,100
4.	Computerisation of office system	10,00000	11,00000	12,10,000	13,31,000	14,64,100
5.	Enclosure maintenance	30,00000	33,00000	36,30,000	39,93,000	43,92,300
6.	Remodelling and Maintenance of transportation cages	15,00000	16,50,000	18,15,000	19,96,500	21,96,150

7.	Zoo Management and Maintenance cost (Engineering, Gardening, Vehicle, telephones, electricity charges, etc.)	50,00000	55,00000	60,50,000	66,55,000	73,20,500
8.	Animal & staff health care (Sanitization, Medicines etc.)	20,00000	22,00000	24,20,000	26,62,000	29,28,200
9.	Miscellaneous (5% of annual budget)	15,00000	16,50,000	18,15,000	19,96,500	21,96,150
	TOTAL	3,10,00000	3,41,00000	3,63,00000	4,12,61,000	4,39,32,000

Sl. No.	Particulars	Amount (Rs.) 2030-31	Amount (Rs.) 2031-32	Amount (Rs.) 2032-33	Amount (Rs.) 2033-34	Amount (Rs.) 2034-35
1.	Annual establishment charges (salary, incentive, uniform, security, statutory payments etc.)	1,28,84,080	1,41,72,488	1,55,89,736.80	1,71,48,710.50	1,73,23,581.60
2.	Feed & Fodder	1,28,84,080	1,41,72,488	1,55,89,736.80	1,71,48,710.50	1,73,23,581.60
3.	Annual outreach and education programme	16,10,510	17,71,561	19,48,717.10	21,43,588.81	23,57,947.69
4.	Computerisation of office system	16,10,510	17,71,561	19,48,717.10	21,43,588.81	23,57,947.69
5.	Enclosure maintenance	48,01,530	52,81,683	58,09,851.30	63,90,836.43	70,29,920.07
6.	Remodelling and Maintenance of transportation cages	24,15,765	26,57,341.50	29,23,075.65	32,15,383.565	35,36,921.92
7.	Zoo Management and Maintenance cost (Engineering, Gardening, Vehicle, telephones, electricity charges, etc.)	80,52,550	88,57,805	97,43,585.50	1,07,17,944.10	1,17,89,738.50
8.	Animal & staff health care (Sanitization, Medicines etc.)	32,21,020	35,43, 122	38,97,434.20	42,87,177.62	47,15,895.38
9.	Miscellaneous (5% of annual budget)	24,15,765	26,57,341.50	29,23,075.65	32,15,383.565	35,36,921.92
	TOTAL	4,98,95,810	5,13,42,26	6,03,73,93	6,64,11,324	6,99,72,456

		9	0		

Sl. No.	Particulars	Amount (Rs.) 2035-36	Amount (Rs.) 2036-37	Amount (Rs.) 2037-38	Amount (Rs.) 2038-39	Amount (Rs.) 2039-40
1.	Annual establishment charges (salary, incentive, uniform, security, statutory payments etc.)	1,90,55,939.80	2,09,61,533.80	2,30,57,687.20	2,53,63,455.90	2,78,99,801.50
2.	Feed & Fodder	1,90,55,939.80	2,09,61,533.80	2,30,57,687.20	2,53,63,455.90	2,78,99,801.50
3.	Annual outreach and education programme	25,93,742.46	28,53,116.71	31,38,428.38	34,52,271.22	37,97,498.34
4.	Computerisation of office system	25,93,742.46	28,53,116.71	31,38,428.38	34,52,271.22	37,97,498.34
5.	Enclosure maintenance	77,32,912.08	85,06,203.29	93,56,823.62	1,02,92,506	11321756.60
6.	Remodelling and Maintenance of transportation cages	38,90,614.11	42,79,675.52	47,07,643.07	51,78,407.38	56,96,248.12
7.	Zoo Management and Maintenance cost (Engineering, Gardening, Vehicle, telephones, electricity charges, etc.)	1,29,68,712.40	1,42,65,583.60	1,56,92,142	1,72,61,356.20	1,89,87,491.80
8.	Animal & staff health care (Sanitization, Medicines etc.)	51,87,484.92	57,06,233.41	62,76,856.75	69,04,542.43	75,94,994.67
9.	Miscellaneous (5% of annual budget)	38,90,614.11	42,79,675.52	47,07,643.07	51,78,407.38	56,96,248.12
	TOTAL	7,69,69,702	8,46,66,672	9,31,33,340	10,24,46,674	11,26,91,339

Sl. No.	Particulars	Amount (Rs.) 2040-41	Amount (Rs.) 2041-42	Amount (Rs.) 2042-43	Amount (Rs.) 2043-44	Amount (Rs.) 2044-45
1.	Annual establishment charges (salary, incentive,	3,06,89,781.70	3,37,58,759.90	3,71,34,635.90	4,08,48,099.50	4,49,32,909.50

	uniform, security, statutory payments etc.)					
2.	Feed & Fodder	3,06,89,781.70	3,37,58,759.90	3,71,34,635.90	4,08,48,099.50	4,49,32,909.50
3.	Annual outreach and education programme	41,77,248.17	45,94,972.99	50,54,470.29	55,59,917.32	61,15,909.05
4.	Computerisation of office system	41,77,248.17	45,94,972.99	50,54,470.29	55,59,917.32	61,15,909.05
5.	Enclosure maintenance	1,24,53,932.30	1,36,99,325.50	1,50,69,258.10	1,65,76,183.90	1,82,33,802.30
6.	Remodelling and Maintenance of transportation cages	62,65,872.93	68,92,460.22	75,81,706.24	83,39,876.86	91,73,864.55
7.	Zoo Management and Maintenance cost (Engineering, Gardening, Vehicle, telephones, electricity charges, etc.)	2,08,86,241	2,29,74,865.10	2,52,72,351.60	2,77,99,586.80	3,05,79,545.50
8.	Animal & staff health care (Sanitization, Medicines etc.)	83,54,494.14	91,89,943.55	1,01,08,937.90	1,11,19,831.70	1,22,31,814.90
9.	Miscellaneous (5% of annual budget)	62,65,872.93	68,92,460.22	75,81,706.24	83,39,876.86	91,73,864.55
	TOTAL	12,39,60,473	13,63,56,520	14,99,92,172	16,49,91,390	18,14,90,529

10.2 Construction and Development

For construction and development purpose, modification and new enclosure construction are being considered separately.

As per the proposed layout plan some of the existing infrastructures are to be modified, some are to be redone and new enclosures may also have to be built. Accordingly, a line estimate considering current prevailing rates is prepared for different item of works as detailed below:

I. Construction of New Enclosures

The following enclosures are required to develop as per the proposed layout plan:

Sl. No.	Particulars	Amount Rs.
1.	Gharial	**21,40,000**
2.	Crocodile Enclosure	**21,40,000**
3.	Water bird Aviary	**35,00,000**
4.	Peafowl Enclosure	**10,00,000**
5.	3 Monitor Lizard enclosure	**15,00,000**
6.	4 Flying Bird Aviary	**60,00,000**
7.	Walk-in Bird Aviary	**60,00,000**
8.	Emu Enclosure	**11,00,000**
9.	Cassowary enclosure	**35,00,000**
10.	Snake House	**20,50,000**
11.	2 Tortoise Enclosure	**10,00,000**
12.	Hippo Enclosure	**35,00,000**
13.	Mixed Deer Enclosure	**11,40,000**
14.	Pangolin CBC	**24,50,000**
15.	Pangolin Enclosure	**5,00,000**
16.	Pocupine Enclosure	**5,00,000**
17.	Dhole Enclosure	**26,70,000**
18.	Bengal Fox Enclosure	**26,70,000**
19.	Pangolin off-display area	**13,50,000**
20.	Asiatic Lion enclosure	**27,00,000**
21.	Tiger Enclosure	**30,00,000**
22.	Tiger Safari	**200000000**
23.	Mixed antelope Enclosure	**15,80,000**
24.	Children's Park	**20,00,000**

Sl. No.	Particulars	Amount Rs.
25.	Fodder Farm	**3,80,000**
26.	Rescue Centre	**6,50,000**
27.	Quarantine Centre	**6,60,000**
28.		
	TOTAL	**5,40,00,000**

In words: Three Crore Fifty Lakh Forty Thousand only.

II. Construction of new infrastructures as per the proposed layout plan the following enclosures require to be built:

Sl. No.	Particulars	Amount Rs.
1.	Construction of new service road, multipurpose pathway and Land development/drainage of surface run off with the help of recharge pit	**1,48,00,000**
2.	Water supplies up-gradation & extension with overhead tank and tube well boring pump, Under Ground Reservoir(URG) with fire hydrant system, Water pipeline & supply networks	**1,00,00,000**
3.	Construction of toilet block	**13,00,000**
4.	Construction of additional boundary wall	**10,00,000**
5.	Construction of child care unit for visitors	**9,50,000**
6.	Construction of Souvenir Centre	**25,00,000**
7.	Construction of drainage system network and waste water treatment	**27,00,000**
8.	Construction of car parking facility	**15,00,000**

9.	Construction of incinerator	**10,00,000**
10.	Reconstruction of animal feed store & kitchen	**10,00,000**
11.	Renovation & remodelling of veterinary hospital	**10,00,000**
12.	Electrical network and transformer with DG complete electrical network,	**85,00,000**
	TOTAL	**4,62,50,000**

In words: Four Crore Sixty Two Lakh Fifty Thousands Only.

III. Essential expenditure as per the proposed layout plan the following enclosures require to be built:

Sl. No.	Particulars	Amount Rs.
1.	Installation of CCTV & Public Address	**12,00,000**
2.	Purchase of vehicles	**15,00,000**
3.	Survey and documentation	**5,50,000**
4.	Purchase & Up-gradation of available equipment at veterinary hospital	**21,00,000**
5.	Purchase of sanitation equipment, water pumps, miscellaneous equipment for maintenance	**4,00,000**
6.	Purchase of disaster management equipment	**2,50,000**
7.	Purchase of communication equipment	**4,00,000**
8.	Landscaping and beautification	**55,00,000**
9.	Installation of water ATM (....numbers)	**12,00,000**
10.	Animal Transportation Cage	**8,00,000**
11.	Enclosure enrichment	**25,00,000**
12.	Camera, GPS, Search light etc	**9,00,000**

TOTAL	**1,73,00,000**

In words: One Crore Seventy Three Lakhs Only.

10.3 Day to day maintenance: At present following recurring expenditure is incurred on various items as given below:

SL. NO.	ITEM OF WORKS (HEAD OF SERVICE)	AMOUNT
1	**Wages & Honorarium(CDI AND RETIRED PERSONAL)**	**21,917/-**
1	**NUTRITION AND HEALTH CARE-Diet for zoo animals**	**21,917/-**
3	**ZOO OPERATION COSTS Hire**	**10,598/-**
4	**ELECTRICITY and other CHARGES**	**13,698/-**
5	**REPAIR AND MAINTENANCE**	**4,109/-**
	Total	**72,239/-**

Chapter: 11
Management Plan

Year wise Budget (Plan)

Junglemahal Zoological Park (in lakhs)																						
Sl. No.	Items of Work	2024-2025		2025-2026		2026-2027		2027-2028		2028-2029		2029-2030		2030-2031		2031-2032		2032-2033		2033-2034		Funding Agency
		Physical	Financial	Physical	Financial	Physical	Financial	Physical	Financial	Physical	Financial	Physical	Financial	Physical	Financial	Physical	Financial	Physical	Financial	Physical	Financial	
1.	Construction of Fishing cat CBC	1	26.40																			WBZA, Department of Forests, West Bengal.
2.	Construction of Water Bird aviary	1	35.50																			
3.	Construction of Peafowl Enclosure	1	10.00																			
4.	Construction of Monitor Lizard Enclosure	1	15.00																			
5.	Construction of Mixed Bird Aviary	1	15.00																			
6.	Construction of Flightless	1	11.00																			

	bird Aviary																			
7.	Construction of Reptile House	1	20.50																	
8.	Construction of Quarantine Centre	1	6.60																	
9.	Construction of Rescue Centre	1	6.50																	
10.	Construction of Visitor's Shed	2	3.00																	
11.	Construction of Mixed Deer Enclosure-1	1	11.40																	
12.	Construction of Fishing Cat off Display area	1	9.50																	
13.	Construction of Pangolin Enclos		5.00																	

	ure																			
14.	Construction of Parking Area	1	4.00																	
15.	Construction of Toilet	2	3.50																	
16.	Construction of Childrен's Park	1	20.00																	
17.	Construction of Jackal Enclosure	1	26.70																	
18.	Construction of Fox Enclosure	1	26.70																	
19.	Construction of leopard off-display area	1	13.50																	
20.	Construction of Bear enclosure	1	27.00																	
21.	Construction of Tiger Enclosure	1	30.00																	
22	Construction	1	3.80																	

.	n of Fodder Farm																				
23.	Construction of Mixed antelope Enclosure	1	15.80																		
24.	Construction of Child Care Unit	1	9.50																		
25.	Construction of Visitor's path	...m																			
26.	Construction of Service road	...m																			
27.	Construction of stand off barriers					L.S.	3.00					L.S.	2.00			L.S.	1.50			L.S.	1.00
28.	CCTV installation					L.S.	4.50							L.S.	3.50					L.S.	2.50
29.	Maintenance of Enclosures							L.S.	6.50					L.S.	7.50			L.S.	9.50		
30.	Maintenance of Buildi									L.S.	6.50			L.S.	8.50			L.S.	8.50		

	ng structures																				
31.	Maintenance of Visitor's path									L.S.	4.50					L.S.	3.50			L.S.	2.50
32.	Maintenance of service path											L.S.	4.50					L.S.	5.50		
33.	Maintenance of boundary wall									L.S.	4.50					L.S.	5.50				
34.	Maintenance of power supply									L.S.	3.00					L.S.	2.50			L.S.	2.00
35.	Establishment of Water tank with water supply					L.S.	8.50									L.S.	4.80				

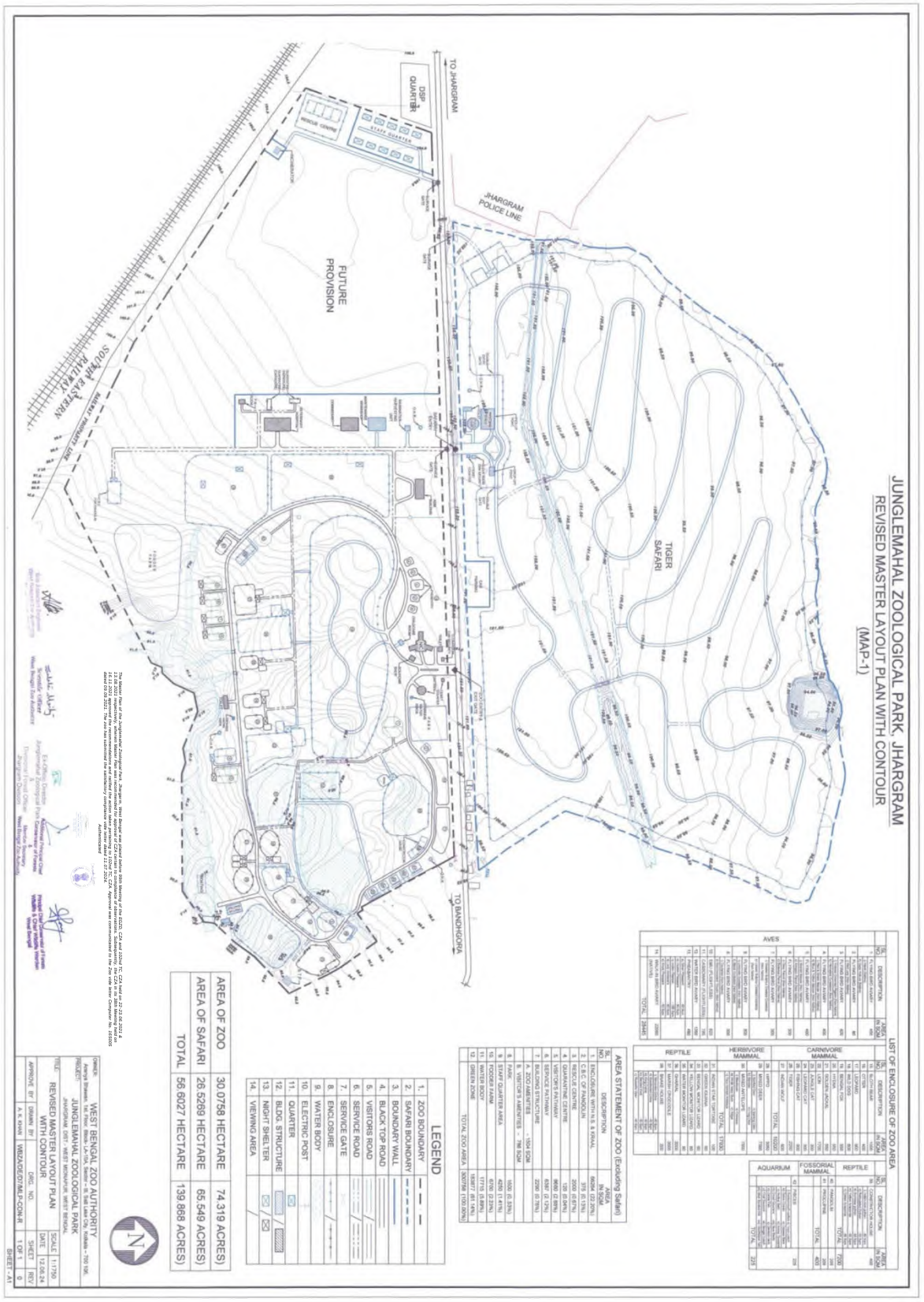
Sl. No.	Particulars	Amount (Rs.) 20 years
1.	**Annual establishment charges (salary, incentive, uniform, security, statutory payments etc.)**	**4,49,32,909.50**
2.	**Feed & Fodder**	**4,49,32,909.50**
3.	**Annual outreach and education programme**	**61,15,909.05**
4.	**Computerisation of office system**	**61,15,909.05**

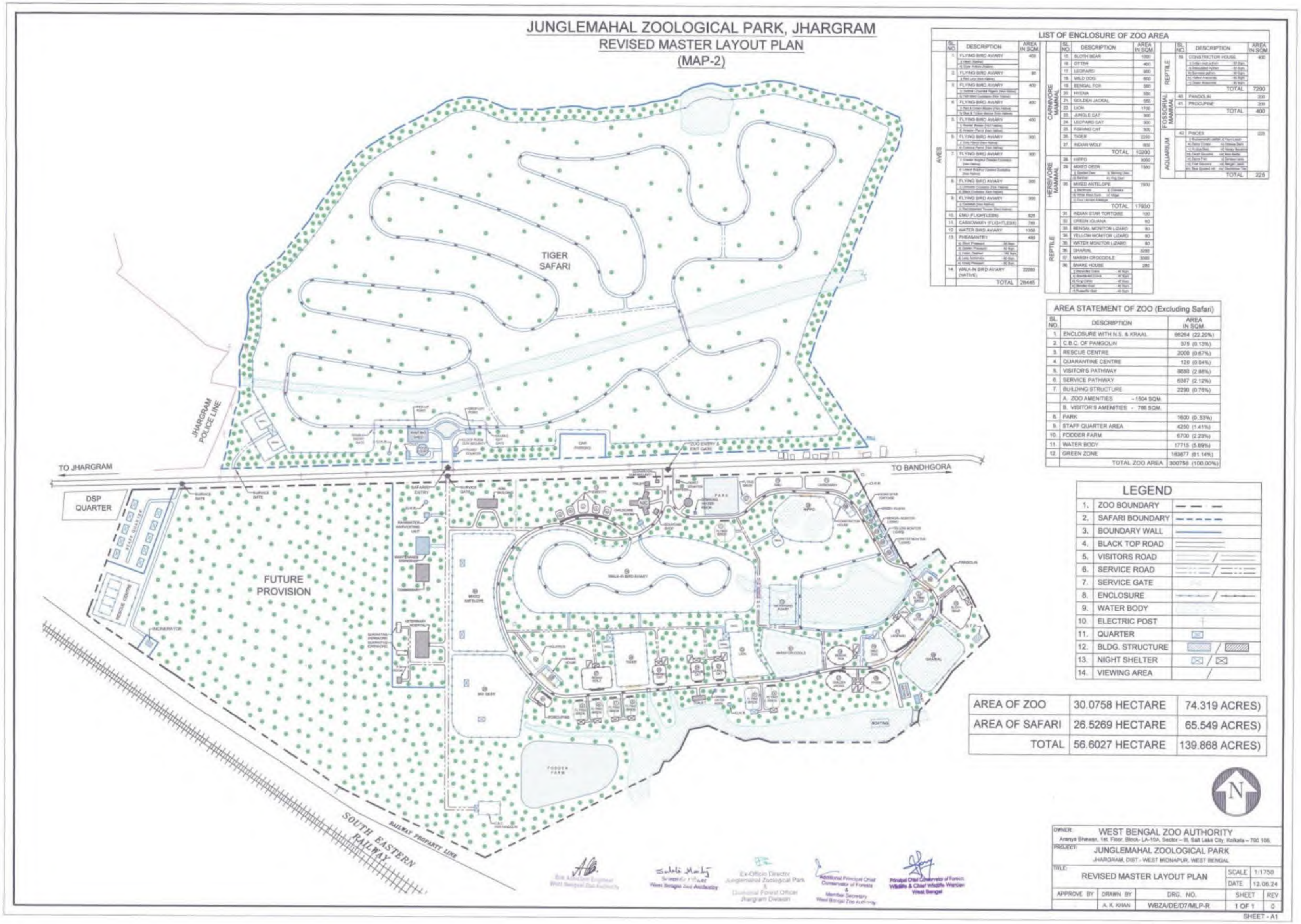
5.	**Enclosure maintenance**	**1,82,33,802.30**
6.	**Remodelling and Maintenance of transportation cages**	**91,73,864.55**
7.	**Zoo Management and Maintenance cost (Engineering, Gardening, Vehicle, telephones, electricity charges, etc.)**	**3,05,79,545.50**
8.	**Animal & staff health care (Sanitization, Medicines etc.)**	**1,22,31,814.90**
9.	**Miscellaneous (5% of annual budget)**	**91,73,864.55**
	TOTAL	**18,14,90,529**

ANNEXURES

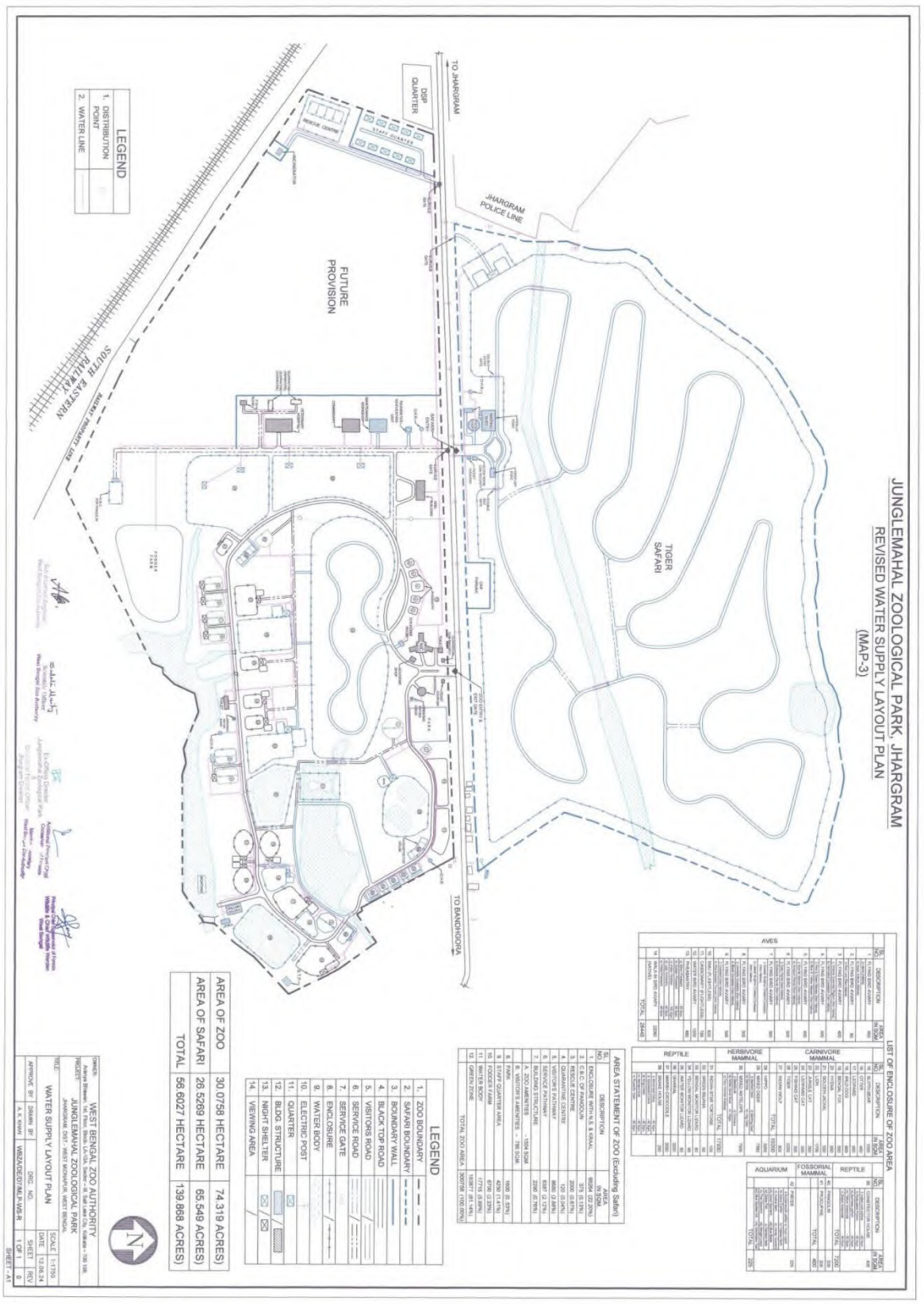
Annexure I: Proposed Master Layout Plan (Revised) with Contour

Annexure I (a): Proposed Master Layout Plan (Revised)

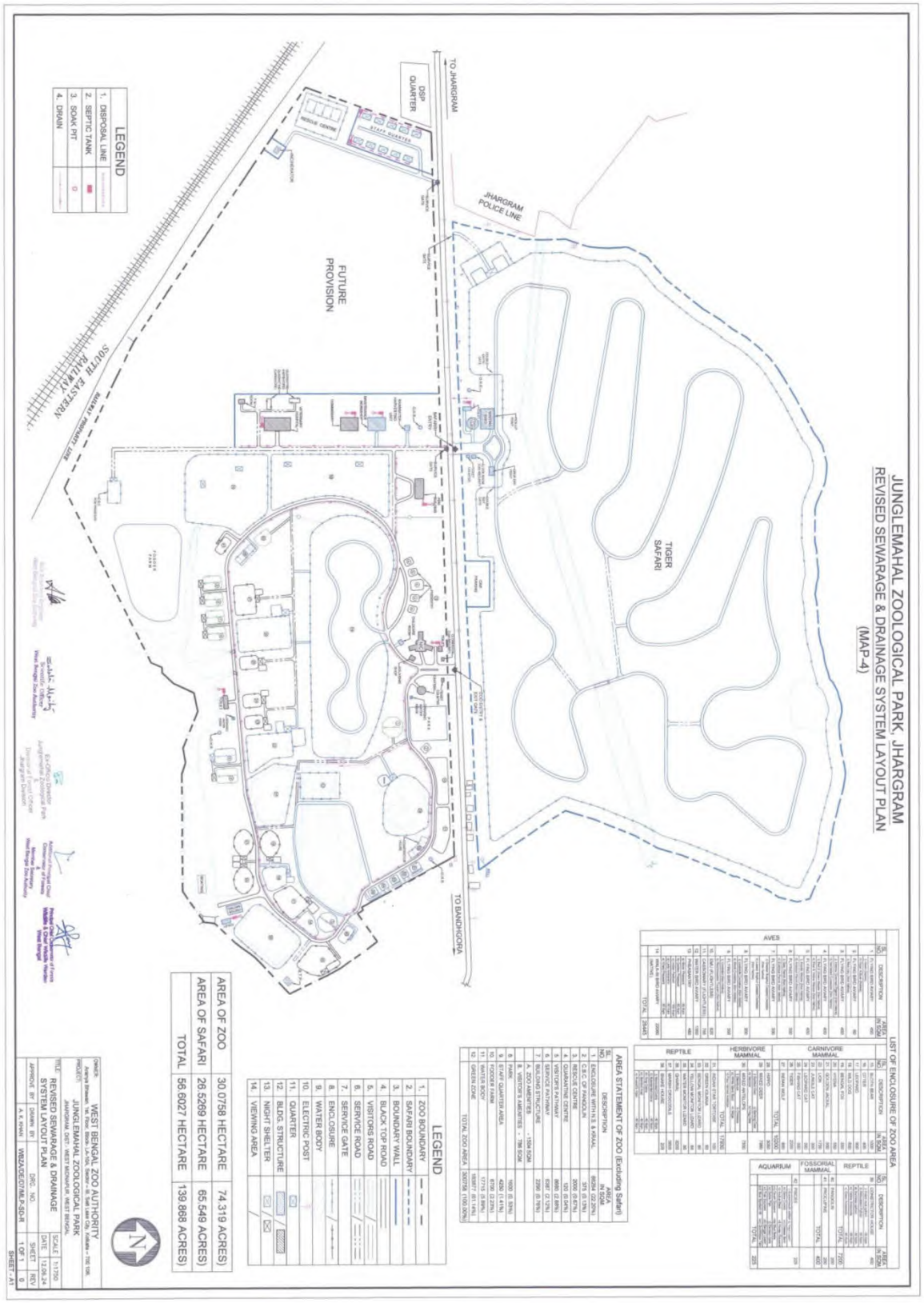



JUNGLEMAHAL ZOOLOGICAL PARK, JHARGRAM
REVISED MASTER LAYOUT PLAN
(MAP-2)
TIGER SAFARI
FUTURE PROVISION
TO JHARGRAM
TO BANDHGORA
JHARGRAM POLICE LINE
DSP QUARTER
SOUTH EASTERN RAILWAY
RAILWAY PROPERTY LINE
FODDER FARM
LIST OF ENCLOSURE OF ZOO AREA
AVES
1. FLYING BIRD AVIARY 400
2. FLYING BIRD AVIARY 90
3. FLYING BIRD AVIARY 400
4. FLYING BIRD AVIARY 400
5. FLYING BIRD AVIARY 400
6. FLYING BIRD AVIARY 300
7. FLYING BIRD AVIARY 300
8. FLYING BIRD AVIARY 300
9. FLYING BIRD AVIARY 300
10. EMU (FLIGHTLESS) 820
11. CASSOWARY (FLIGHTLESS) 780
12. WATER BIRD AVIARY 1350
13. PHEASANTRY 480
14. WALK-IN BIRD AVIARY (NATIVE) 22080
TOTAL 28445
CARNIVORE MAMMAL
15. SLOTH BEAR 1000
16. OTTER 400
17. LEOPARD 900
18. WILD DOG 600
19. BENGAL FOX 580
20. HYENA 580
21. GOLDEN JACKAL 580
22. LION 1700
23. JUNGLE CAT 300
24. LEOPARD CAT 300
25. FISHING CAT 300
26. TIGER 2250
27. INDIAN WOLF 800
TOTAL 10200
HERBIVORE MAMMAL
28. HIPPO 3050
29. MIXED DEER 7380
30. MIXED ANTELOPE 7500
TOTAL 17930
REPTILE
31. INDIAN STAR TORTOISE 100
32. GREEN IGUANA 80
33. BENGAL MONITOR LIZARD 80
34. YELLOW MONITOR LIZARD 80
35. WATER MONITOR LIZARD 80
36. GHARIAL 3200
37. MARSH CROCODILE 3000
38. SNAKE HOUSE 200
REPTILE
39. CONSTRICTOR HOUSE 400
TOTAL 7200
FOSSORIAL MAMMAL
40. PANGOLIN 200
41. PROCUPINE 200
TOTAL 400
AQUARIUM
42. PISCES 225
TOTAL 225
AREA STATEMENT OF ZOO (Excluding Safari)
SL. NO. | DESCRIPTION | AREA IN SQM.
1. ENCLOSURE WITH N.S. & KRAAL 66264 (22.20%)
2. C.B.C. OF PANGOLIN 375 (0.13%)
3. RESCUE CENTRE 2000 (0.67%)
4. QUARANTINE CENTRE 120 (0.04%)
5. VISITOR'S PATHWAY 8680 (2.88%)
6. SERVICE PATHWAY 6387 (2.12%)
7. BUILDING STRUCTURE 2290 (0.76%)
A. ZOO AMENITIES - 1504 SQM.
B. VISITOR'S AMENITIES - 786 SQM.
8. PARK 1600 (0.53%)
9. STAFF QUARTER AREA 4250 (1.41%)
10. FODDER FARM 6700 (2.23%)
11. WATER BODY 17715 (5.89%)
12. GREEN ZONE 163877 (61.14%)
TOTAL ZOO AREA 300756 (100.00%)
LEGEND
1. ZOO BOUNDARY
2. SAFARI BOUNDARY
3. BOUNDARY WALL
4. BLACK TOP ROAD
5. VISITORS ROAD
6. SERVICE ROAD
7. SERVICE GATE
8. ENCLOSURE
9. WATER BODY
10. ELECTRIC POST
11. QUARTER
12. BLDG. STRUCTURE
13. NIGHT SHELTER
14. VIEWING AREA
AREA OF ZOO 30.0758 HECTARE 74.319 ACRES)
AREA OF SAFARI 26.5269 HECTARE 65.549 ACRES)
TOTAL 56.6027 HECTARE 139.868 ACRES)
N
OWNER: WEST BENGAL ZOO AUTHORITY
Aranya Bhawan, 1st. Floor, Block- LA-10A, Sector – III, Salt Lake City, Kolkata – 700 106.
PROJECT: JUNGLEMAHAL ZOOLOGICAL PARK
JHARGRAM, DIST - WEST MIDNAPUR, WEST BENGAL
TITLE: REVISED MASTER LAYOUT PLAN
SCALE 1:1750
DATE 12.06.24
APPROVE BY
DRAWN BY A. K. KHAN
DRG. NO. WBZA/DE/D7/MLP-R
SHEET 1 OF 1
REV 0
SHEET - A1

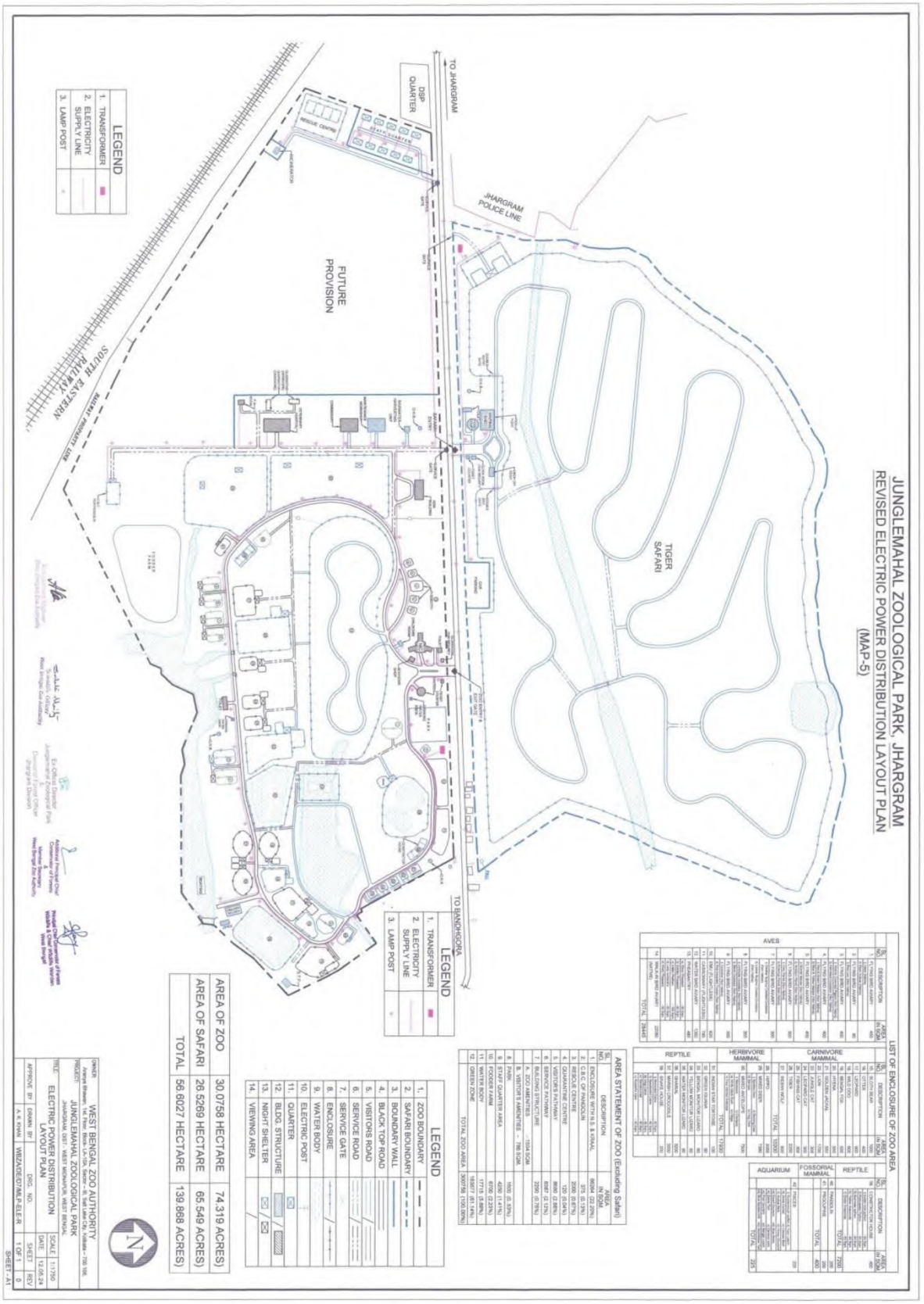
Annexure I (b): Proposed Water Supply Layout Plan



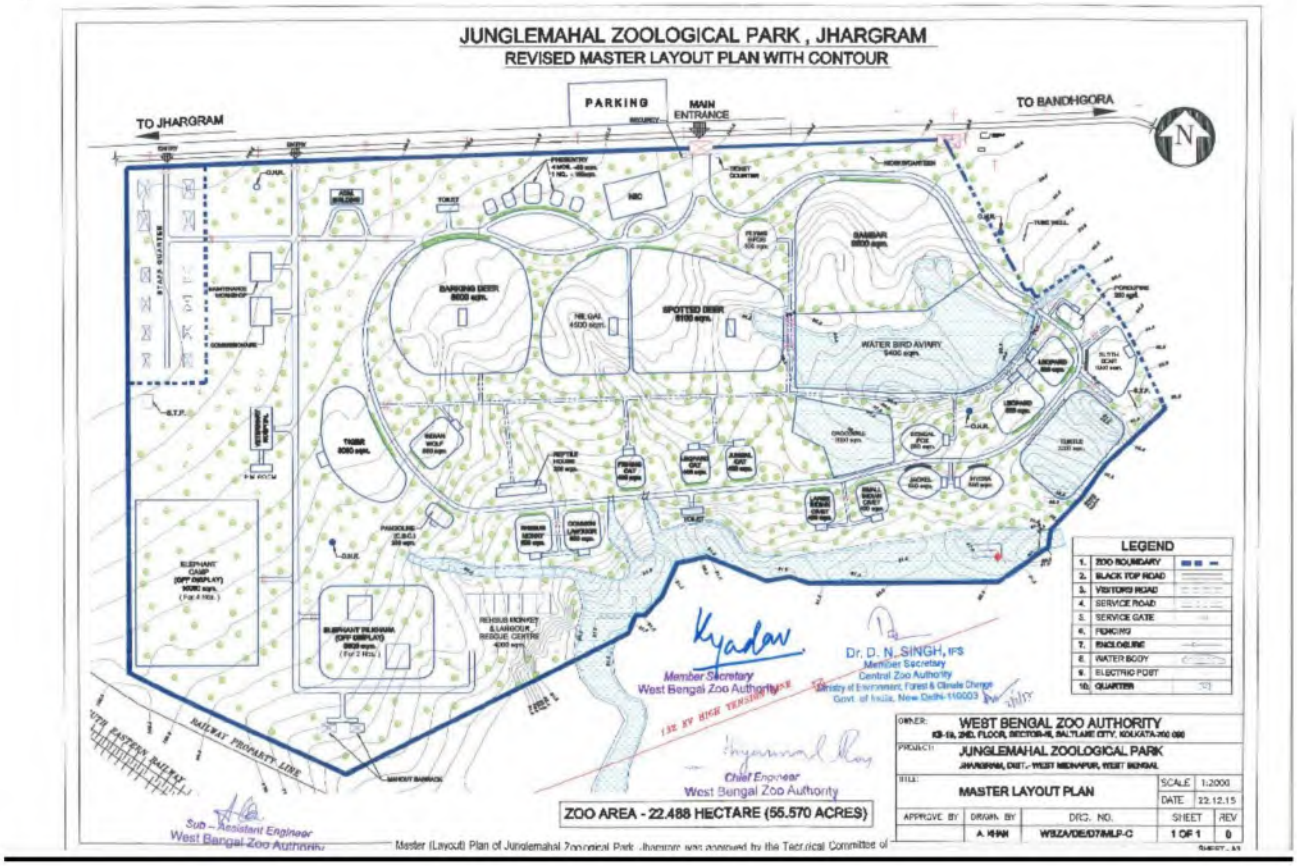
Annexure I (c): Proposed Sewerage and Drainage System Layout Plan



Annexure I (d): Proposed Electric Power Distribution Layout Plan



Annexure II: Approved Master Layout Plan of Junglemahal Zoological Park, Jhargram. Dated:



Annexure III: Animal Collection Plan

Sl.No	Species	Existing Stock				Proposed Collection				Animals to be acquired/ disposed				Remarks
	Mammals	M	F	U	Total	M	F	U	Total	M	F	U	Total	
1	Tiger *(Panthera tigris)*	**0**	**0**	**0**	**0**	4	4	**0**	8	4	4	**0**	8	8 to be acquired from recognized zoo
2	Asiatic Lion *(Panthera leo)*	**0**	**0**	**0**	**0**	2	2	**0**	4	2	2	**0**	4	4 to be acquired from recognized zoo
3	Leopard *(Panthera pardus*)	1	**2**	**0**	3	2	2	**0**	4	1	0	**0**	1	1 to be acquired from recognized zoo
4	Sloth Bear *(Melursus urnicus*)	**0**	2	**0**	2	2	2	**0**	4	2	**0**	**0**	2	2 to be acquired from recognized zoo
5	Jungle Cat *(Felis chaus)*	4	1	**0**	5	4	4	**0**	8	**0**	3	**0**	3	3 to be acquired from recognized zoo
6	Fishing Cat *(Prionailurusviverrinus)*	3	**3**	**0**	6	4	4	**0**	8	1	1	**0**	2	2 to be acquired from recognized zoo
7	Leopard Cat *(Prionailurus bengalensis)*	**0**	**0**	**0**	**0**	3	3	**0**	6	3	3	**0**	6	6 to be acquired from recognized zoo
8	Stripped Hyena *(Hyaenahyaena)*	2	1	**0**	3	3	3	**0**	6	1	2	**0**	3	3 to be acquired from recognized zoo
9	Indian Grey Wolf *(Canis lupus)*	1	4	**0**	5	3	3	**0**	6	2	**-1**	**0**	2	2 male will be acquired & 1 female disposed
10	Bengal Fox (*Vulpes bengalensis*)	0	**0**	**0**	**0**	3	3	**0**	6	3	3	**0**	6	6 to be acquired from recognized zoo
11	Golden Jackal *(Canis aureus)*	0	**0**	**0**	**0**	3	3	**0**	6	3	3	**0**	6	6 to be acquired from recognized zoo
12	Spotted Deer *(Axis axis)*	46	47	0	93	10	14	**0**	24	**-36**	**-33**	**0**	-69	69 deer will be disposed
13	Barking Deer *(Muntiacus muntijak*)	10	18	**0**	28	4	4	**0**	8	**-6**	**-14**	**0**	-20	20 deer will be disposed
14	Sambar *(Cenvus unicolor)*	4	0	**0**	4	4	4	**0**	8	0	4	**0**	4	4 Sambar to be acquired
15	Hog Deer *(Axis porcinus)*	0	0	0	0	4	4	0	8	4	4	0	8	8 to be acquired from recognized zoo
16	Blackbuck *(Antilope cervicapra)*	0	0	0	0	4	4	0	8	4	4	0	8	8 to be acquired from recognized zoo

17	White black Buck (*Antilope cervicapra*)	0	0	0	0	4	4	0	8	4	4	0	8	8 to be acquired from recognized zoo
18	Four Horned Antelope *(Tetracerus quadricornis)*	0	0	0	0	4	4	0	8	4	4	0	8	8 to be acquired from recognized zoo
19	Nilgai *(Boselaphus tragocamelus)*	11	15	0	26	4	4	0	8	-7	-11	0	-18	18 to be disposed off
20	Chinkara *(Gazella bennettii)*	0	0	0	0	4	4	0	8	4	4	0	8	8 to be acquired from recognized zoo
21	Indian Pangolin *(Manis crassicaudata)*	**0**	**0**	**0**	**0**	2	4	**0**	6	2	4	**0**	6	6 to be acquired from recognized zoo
22	Porcupine *(Hystrix indica)*	**0**	**0**	3	3	2	4	**0**	6	2	4	**0**	6	6 to be acquired from recognized zoo
23	Small Clawed Otter *(Amblonyx cinereus)*	0	0	0	0	2	4	**0**	6	2	4	**0**	6	6 to be acquired from recognized zoo
Aves														
Flightless Birds														
24	Emu (*Dromaius nova chollandiac*)	3	2	0	5	3	2	0	5	0	0	0	0	---
25	Cassowary (*Casuarius casuarius*)	**0**	**0**	**0**	**0**	2	2	**0**	4	2	2	**0**	4	4 to be acquired from recognized zoo
Pheasant														
26	Indian Peafowl *(Pavo cristatus)*	4	5	0	9	10	10	0	20	6	5	0	11	11 to be acquired from recognized zoo/ captive breeding
27	Red Jungle Fowl *(Galus galus)*	5	8	0	13	10	10	0	20	5	2	0	7	7 to be acquired from recognized zoo/ captive breeding
28	Grey Jungle fowl *(Gallus sonnerati)*	0	0	0	0	5	5	0	10	5	5	0	10	10 to be acquired from recognized zoo
29	Silver Pheasant (*Lophura nycthemera*)	1	3	0	4	5	5	0	10	4	2	0	6	6 to be acquired from recognized zoo/ captive breeding

30	Khalij Pheasant (*Lophura leucomelanos*)	1	2	0	3	5	5	0	10	4	3	0	7	7 to be acquired from recognized zoo/ captive breeding
31	Golden Pheasant (*Chrysolophus pictus*)	3	2	0	6	5	5	0	10	2	3	0	5	5 to be acquired from recognized zoo/ captive breeding
32	Lady Amherst's Pheasant (*Chrysolophus amherstiae*)	0	1	0	1	5	5	0	10	5	4	0	9	9 to be acquired from recognized zoo
33	Black Patridge, *(Melanoperdix niger)*	0	0	0	0	5	5	0	10	5	5	0	10	10 to be acquired from recognized zoo
	Flying Birds (Native)													
34	Oriental white backed/Gyps Vulture, *Gyps bengalensis*	0	0	1	1	5	5	0	10	5	5	-1	10	10(5:5:0) to be acquired and 1 Unsexed to be disposed
35	Hawk , *Buteo jamaicensis*	0	1	1	2	5	5	0	10	5	4	-1	9	9 (5:4:0) to be acquired and 1 Unsexed to be disposed
36	Common Babbler (*Purdoides caudate*)	0	0	0	0	5	5	0	10	5	5	0	10	10 to be acquired from recognized zoo
37	Hill Mayna *(Gracula religiosa)*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
38	Common Myna *(Acridotheres tristis)*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
39	Jungle Myna *(Acridotheres fuscus)*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
40	White-rumped Munia *(Lonchura striata)*	0	0	0	0	2	3	0	5	2	3	0	5	To be acquired from recognized zoo
41	Blue-throated Barbet *(Megalaima asiatica)*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
42	Asian Pied Starling *(Gracupica contra)*	0	0	0	0	5	5	0	10	5	5	0	10	To be acquired from recognized zoo
43	Brahminy Starling	0	0	0	0	5	5	0	10	5	5	0	10	To be acquired from

	(*Sturnia pagodarum*)													recognized zoo
44	Asian Pied Starling (*Gracupica contra*)	0	0	0	0	5	5	0	10	5	5	0	10	To be acquired from recognized zoo
45	scaly-breasted munia or spotted munia *(Lonchura punctulata)*	0	0	1	1	5	5	0	10	5	5	-1	10	10 To be acquired from recognized zoo and 1 Unsexed to be disposed
46	Tri-colour Munia Munia *(Lonchura Malacca)*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
47	Black-headed/ Chestnut munia (*Lonchura articapilla*)	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
48	Red Avadavat (*Amandavaaman dava*)	0	0	0	0	5	5	0	10	5	5	0	10	To be acquired from recognized zoo
49	Red-whiskered Bulbul (*Pycnonotus jocosus*)	0	0	0	0	5	5	0	10	5	5	0	10	To be acquired from recognized zoo
50	Red-vented Bulbul (*Pycnonotus cafer*)	0	0	0	0	5	5	0	10	5	5	0	10	To be acquired from recognized zoo
51	Tailor Bird (*Orthotomus sp.*)	0	0	0	0	5	5	0	10	5	5	0	10	To be acquired from recognized zoo
52	Purple Sunbird (*Cinnyris asiaticus*)	0	0	0	0	5	5	0	10	5	5	0	10	To be acquired from recognized zoo
53	Red brested parakeet (*Psittacula alexandri*)	0	0	4	4	5	5	0	10	5	5	-4	10	10 to be acquired from recognized zoo and 4 unsexed to be disposed
54	Alexandrine Parakeet, (*Psittacula eupatria)*	0	0	1	1	5	5	0	10	5	5	-1	10	10 to be acquired from recognized zoo and 1 Unsexed to be disposed
55	Rose-ringed Parakeet, (*Psittacula krameri)*	0	0	6	6	5	5	0	10	5	5	-6	10	10 to be acquired from recognized zoo and 6Unsexed to

														be disposed
56	Indian Pied Myna (*Gracupica contra*)	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
57	Oriental Magpie robin (*Copsychus saularis)*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
58	Black headed oriole (*oriolus xanthormus*)	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
59	Asian Green Bee eater (*Meropos orientalis*)	0	0	0	0	6	6	0	12	6	6	0	12	To be acquired from recognized zoo
60	Diamond Dove *Geopelia cuneata*	0	0	0	0	4	4	0	8	4	4	0	8	To be acquired from recognized zoo
61	Green Imperial Pigeon (*Ducula aenea*)	0	0	0	0	4	4	0	8	4	4	0	8	To be acquired from recognized zoo
62	Yellow-footed Green Pigeon (*Treron phoenicopterus*)	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
Flying Birds (Non Native)														
63	Red & Green Macaw *(Ara chloropterus)*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
64	Amazon Parrot *(Amazona sp.)*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
65	Grey Parrot *(Psittacus erithacus)*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
66	Eclectus Parrot *(Eclectus roratus)*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
67	Scarlet Macaw *(Ara macao)*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
68	Greater Sulphur Crested Cockatoo (*Cacatua galerita*)	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
69	Lesser Sulphur Crested Cockatoo	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from

	(*Cacatua sulphurea*)													recognized zoo
70	Umbrella Cockatoo (*Cacatua alba*)	0	0	0	0	3	3	0	6	3	3	0	6	To be acquired from recognized zoo
71	Blue & Yellow Macaw *(Ara ararauna)*	2	2	0	4	3	3	0	6	1	1	0	2	2 to be acquired from recognized zoo
72	Cockatiel (*Nymphicus hollandicus)*	0	0	15	15	15	15	0	30	+15	+15	-15	30	30 (15:15) to be acquired and 15 unsexed to be disposed
73	Red Lory (*Eos bornea*)	0	0	0	0	4	4	0	8	4	4	0	8	To be acquired from recognized zoo
74	Victoria Crowned Pigeon (*Goura cristata*)	0	0	0	0	4	4	0	8	4	4	0	8	To be acquired from recognized zoo
75	Red-breasted Toucan (*Ramphastos dicolorus*)	0	0	0	0	4	4	0	8	4	4	0	8	To be acquired from recognized zoo
76	Helmeted Curassow (*Pauxi pauxi*)	0	0	0	0	4	4	0	8	4	4	0	8	To be acquired from recognized zoo
77	Black Cockatoo (*Calyptorhynchus banksii*)	0	0	0	0	4	4	0	8	4	4	0	8	To be acquired from recognized zoo
	Water Bird Aviary													
78	White Breasted Water Hen (*Amaurornis phoenicurus*)	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
79	Common Crane (*Grus grus*)	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
80	Sarus crane *(Antigone antigone)*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
81	Indian spot-billed duck *(Anas poecilorhyncha)*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
82	Indian Openbill Stork *(Anastomusn*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized

	oscitans)													zoo
83	Painted Stork *(Mycteria leucocephala)*	0	0	0	0	2	3	0	5	2	3	0	5	To be acquired from recognized zoo
84	Spoonbill *(Platelea leucorodia)*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
85	White Ibis *(Threskiornis molucca)*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
86	Little egret *(Egretta garzetta)*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
87	Pond Heron (*Ardeola sp.*)	0	0	0	0	3	3	0	6	3	3	0	6	To be acquired from recognized zoo
88	Purple Heron (*Ardea purpurea*)	0	0	0	0	3	3	0	6	3	3	0	6	To be acquired from recognized zoo
89	Cattle Egret (*Bubulcus ibis*)	0	0	0	0	3	3	0	6	3	3	0	6	To be acquired from recognized zoo
90	Intermediate Egret (*Ardea intermedia*)	0	0	0	0	3	3	0	6	3	3	0	6	To be acquired from recognized zoo
91	Black Swan (*Cygnusatratus*)	0	0	4	4	4	4	0	8	0	4	0	4	To be acquired from recognized zoo
92	Mute Swan (*Cygnus olor*)	0	0	4	4	4	4	0	8	0	4	0	4	To be acquired from recognized zoo
93	White Chinese Goose (*Ansercygnoidesdomesticus*)	0	0	0	0	4	4	0	8	4	4	0	8	To be acquired from recognized zoo
94	Darter (*Anhingidae sp.*)	0	0	0	0	3	3	0	6	3	3	0	6	To be acquired from recognized zoo
95	Magpie Goose (*Anseranassemipalmata*)	0	0	0	0	3	3	0	6	3	3	0	6	To be acquired from recognized zoo
96	Abdim's Stork (*Ciconia abdimii*)	0	0	0	0	3	3	0	6	3	3	0	6	To be acquired from recognized zoo

97	Harlequin Duck (*Histrionicushistrionicus*)	0	0	0	0	3	3	0	6	3	3	0	6	To be acquired from recognized zoo
98	Paradise Shelduck (*Tadorna variegate*)	0	0	0	0	3	3	0	6	3	3	0	6	To be acquired from recognized zoo
99	Orinoco Goose (*Neochen jubata*)	0	0	0	0	3	3	0	6	3	3	0	6	To be acquired from recognized zoo
100	Indian cormorant (*Phalacrocorax fuscicollis)*	0	0	0	0	3	3	0	6	3	3	0	6	To be acquired from recognized zoo
101	Lesser Adjutant Stork (*Leptoptilos javanicus)*	0	0	2	2	2	2	0	4	2	2	-2	4	4 to be acquired from recognized zoo and 2 unsexed to be disposed
102	Lesser whistling duck, (*Dendrocygna javanica)*	0	0	0	0	2	4	0	6	2	4	0	6	To be acquired from recognized zoo
103	Gadwall (*Mareca strepera*)	0	0	0	0	5	5	0	10	5	5	0	10	To be acquired from recognized zoo
104	Pheasant-tailed Jacana (*Hydrophasianus chirurgus*)	0	0	0	0	4	4	0	8	4	4	0	8	To be acquired from recognized zoo
105	Bronze-winged Jacana (*Metopidius indicus*)	0	0	0	0	4	4	0	8	4	4	0	8	To be acquired from recognized zoo
106	Bar-headed Goose (*Anser indicus*)	0	0	0	0	4	4	0	8	4	4	0	8	To be acquired from recognized zoo
107	Indian Moorhen, *Gallinula chlorophus*	0	0	0	0	2	5	0	7	2	5	0	7	To be acquired from recognized zoo
108	Muscovy duck,*Cairina moschata*	0	0	0	0	2	4	0	6	2	4	0	6	To be acquired from recognized zoo
Reptiles														
109	Marsh Crocodile (*Crocodylus palustris*)	0	0	0	0	3	2	0	5	3	2	0	5	To be acquired from recognized zoo

110	Gharial (*Gavialis gangeticus)*	0	0	0	0	3	2	0	5	3	2	0	5	To be acquired from recognized zoo
111	Water monitor lizard *(Varanus salvator)*	2	2	0	4	2	2	0	4	0	0	0	0	To be acquired from recognized zoo
112	Yellow Monitor Lizard *(Varanus flavescens)*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
114	Bengal Monitor Lizard *(Varanus bengalensis)*	0	0	2	2	2	2	0	4	2	2	-2	4	4 to be acquired from recognized zoo and 2 unsexed to be disposed
115	Green Iguana (*Iguana iguana*)	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
116	Indian star tortoise (*Geochelone elegans*)	0	0	9	9	10	10	0	20	+10	+10	-9	20	20 (10:10) to be acquired and 9 unsexed to be disposed
Constrictor House														
117	Indian rock python, (Python molurus)	0	0	2	2	2	4	0	6	2	4	-2	6	6 to be acquired from recognized zoo and 2 unsexed to be disposed
118	Reticulated Python, (*Malayopython reticulates)*	0	0	0	0	2	4	0	6	2	4	0	6	To be acquired from recognized zoo
119	*Burmese python* (Python bivittatus)	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
120	*Yellow Anaconda (*Eunectes notaeus)	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
121	*Green Anaconda (Eunectes murinus)*	0	0	0	0	2	2	0	4	2	2	0	4	To be acquired from recognized zoo
Snake House														
122	Monocled Cobra *(Naja kaouthia)*	0	0	2	2	4	4	0	8	0	0	-2	8	8 to be acquired and 2 unsexed to be disposed
123	Spectacled Cobra *(Naja naja)*	4	4	0	8	4	4	0	8	4	4	-4	8	8 to be acquired and 4 unsexed to be disposed
124	King Cobra *(Ophiophagus hannah)*	0	0	0	0	4	4	0	8	4	4	0	8	To be acquired from recognized zoo

125	Banded Krait (*Bungaurus fasciatus*)	0	0	0	0	4	4	0	8	4	4	0	8	To be acquired from recognized zoo
126	Russell's Viper (*Daboia russelii*)	0	0	2	2	4	4	0	8	0	0	-2	8	8 to be acquired and 2 unsexed to be disposed
PISCES														
1.	Suckermouth catfish (*Hypostomus plecostomus)*	0	0	0	0	0	0	10	5	0	0	5	5	**nn**
2.	Yoyo Loach (*Botiaalmorhae*)	0	0	0	0	0	0	5	5	0	0	5	5	**n**
3.	Zebra Cichlid (*Archocentrus nigrofasciatus*)	0	0	0	0	0	0	5	5	0	0	5	5	**nn**
4.	Odessa Barb (*Pethiapadamya*)	0	0	0	0	0	0	5	5	0	0	5	5	**nn**
5.	Arulius Barb (*Dawkinsia arulius*)	0	0	0	0	0	0	5	5	0	0	5	5	**n**
6.	Honey Gourami (*Trichogaster chuna*)	0	0	0	0	0	0	5	5	0	0	5	5	**n**
7.	Dwarf Gourami (*Colisalalia)*	0	0	0	0	0	0	5	5	0	0	5	5	**n**
8.	Blue Badis (*Badisbadis)*	0	0	0	0	0	0	5	5	0	0	5	5	**n**
9.	Zebra Fish (*Danio rerio)*	0	0	0	0	0	0	5	5	0	0	5	5	**n**
10.	Denison barb (*Sahyaeria denisonni*)	0	0	0	0	0	0	5	5	0	0	5	5	**n**
11	Frail Gourami (*Ctenops nobilis*)	0	0	0	0	0	0	5	5	0	0	5	5	**n**
12.	Bengal Loach (*Botia Dario*)	0	0	0	0	0	0	5	5	0	0	5	5	**n**
13.	Blue Spotted Hill (*Barilius bakeri*)	0	0	0	0	0	0	5	5	0	0	5	5	**n**
14	Glo/Widow Tetra (Gymnocorymbus ternetzi)	0	0	0	0	0	0	5	5	0	0	5	5	**nn**

Annexure IV: Free living species (Flora & Fauna) found at Junglemahal Zoological Park

List of Flora found in and aroundJungalmahal Zoological Park, Jhargram

Local Name	*Botanical Name*
TREES	
Akashmoni	*Acacia auriculiformis*
Am	*Mangifera indica*
Amla	*Emblica officinalis*
Amra	*Spondias mangifera*
Anjan	*Hardwickiabinata*
Ankura	Alangiumlamarckii
Arjun	*Terminaliaarjuna*
Asan	*Terminalia tomentosa*
Aswatha	*Ficus religiosa*
Bahera	*Terminalia belerica*
Bat	*Ficus bengalensis*
Bel	*Aegle marmelos*
Bhelai	*Semecarpus anacardium*
Cashew	*Anacardium occidentale*
Challa	*Holoptelea integrifolia*
Chhatiwan	*Alstonia scholaris*
Dhaw	*Anogeissus latifolia*
Dumur	*Ficus hispida,* *Ficus glomerata*
Gamar	*Gmelinaarborea*
Halldu (Karam)	*Adina cordifolia*
Haritaki	*Terminaliachebula*
Kanthal	*Artocarpus integrifolia*
Jarul	*Lagerstroemia flosregini*
Jiyal	*Lannea grandis*
Kadam	*Anthocephalus cadamba*
Jam	*Syzigium cumini*
Kathbel	Feronia elephantus
Kendu	Diospyros melanoxylon
Kumbhi	*Careya arborea*
Kusum	*Schlichera trijuga*
Mahul	*Madhuca indica*
Minjiri	*Cassia siamea*
Neem	*Azadirachta indica*
Ata	*Anona reticulata*
Palash	*Butea frondosa*
Panjan	*Ougeinia dalbergioides*
Parasi	*Cleistanthus collinus*
Peasal	*Pterocarpus marsupium*
Piyal	*Buchanania lanzan*
Rahara	*Soymidafebrifuga*
Sal	*Shorea robusta*
Sidha	*Lagerstroemia parviflora*

Simul	*Bombax ceiba*
Siris	*Albizzia lebbek*
Teak	*Tectona grandis*

List of Shrubs/Herbs /Weeds found in and around Jungalmahal Zoological Park, Jhargram

Local Name	***Botanical Name***
Akanda	*Calotropisgigantea, C. procera*
Anantamul	*Hemidesmus indicus*
Asamlata	*Eupatorium odoratum*
Atari	*Combretum decandrum*
Bangnoki	*Martynia diandra*
Bainchi	*Flacourtia cataphracta*
Bankalmi	*Ipomea carnea*
Bantulsi	*Ocimum cannum*
Berela	*Sida cordifolia*
Bhabri	*Lantana camara*
Bhant	*Clerodendron infortunatum*
Bheranda	*Jatropa curcus*
Bhurur	*Cardenia gummifera*
Bichchoo	*Girardinia diversifolia*
Chagalkhuri	*Ipomoea biloba*
Chakunda	*Cassia tora*
Sarpagandha	*Rauwolfia serpentina*
Dhutura	*Datura stramonium*
Green chiretta	*Andrographis paniculata*
Karabi	*Nerium odoratum*
Kul	*Zizyphus xylocarpa, Z, jujuba*
Kurchi	*Holarrhena antidysenterica*
Nilkanta	*Curcuma cassia*
Nishinda	*Vitex negundo*
Putla	*Croton oblongifolius*
Satamul	*Asparagus racemosus*
Lajyabati	*Mimosa rubicaulis*
CLIMBERS	
Swarnalata	*Cuscuta reflexa*
Alkusi	*Mucuna pruriens*
Birmunga	*Dalbergia volubilis*
Biswal	*Acacia pinnata*
Dudhilata	*Ichnocarpus frutescens*
Ekleja	*Cissampelos Pereira*

Gaj	*Milletia auriculata*
Goalilata	*Vitis pedata*
Govila	*Vitis latifolia*
Gulancha	*Tinospora cordifolia*
Kantaalu	*Dioscorea pentaphylla*
Kunch	*Abrus precatorius*
Latapalash	*Butea superba*
LatKanchan	*Bauhinia vahlii*
Shoraalu	*Dioscorea nummularia*

List of the Bamboos and Grasses found in and around Jungalmahal Zoological Park, Jhargram

BAMBOOS AND GRASSES
Andropogon apricus
Arundinella setosa
Arundinella tenella
Bombusa spp.
Chrysopogon aciculatus
Cynodon dactylon
Heteropogon contortus
Panicum humile
Saccharum Spontaneum

List of Fauna/Avifauna &Reptiles found in and around Jungalmahal Zoological Park, Jhargram

Local Name	***Zoological Name***
MAMMALS :	
Indian Elephant (Elephant)	*Elephas maximus*
Sloth Bear	*Melurs usursinus*
Deer	*Axis axis*
Wolf	*Canis lupas pallipes*
Indian Fox	*Vulpes bengalensis*
Jackal	*Canis aureus*
Indian Pangolin	*Manis crassicaudata*
Indian Wild Boar	*Sus scrofa*
Indian Hare	*Lepus nigricollis*

Tree and Bush Rats	*Golunda ellioti*
Rat	*Bandicota indica*
Squirrel	*Funambulus pennanti*
Small Bat	*Taphozous melanopogon*
Small Indian Mongoose	*Herpestes auropunctatus*
Common Mongoose	*Herpestes edwardsi*
Civet Cat	*Viverricula indica*
Khotas	*Felis manul*
Rhesus Macaque	*Macaca mulatta*
Common Langur	*Presbytis entellus*
BIRDS :	
Moyna	*Gracula religiosa peninsuloris*
Indian Moyna	*Gracula religiosa indica*
Night Heron	*Nycticorax nycticorax*
Pond Heron	*Ardeola grayii*
Cattle Egrat	*Bubulcus ibis*
Little Egrat	*Egretta garzetta*
Common Kite	*Milvus migrans*
Rock Bush Quail	*Perdicula argoondah*
Spotted Dove	*Streptopelia chniensis*
Rose Ringed Parakeet	*Psittacula krameri*
Indian Cuckoo	*Cuculus micropterus*
Indian Drongo Cuckoo	*Sumiculus lugubris*
Screech Owl	*Tyto alba*
Grass Owl	*Tyto capensis*
Common Indian Nightjar	*Caprimulgus asiaticus*
Stock Billed King Fisher	*Pelargopsis capennis*
Black Backed Wood Pecker	*Chrysocolaptes festivus*
Golden Backed Wood Pecker	*Dinopium javaneses*
SNAKES :	
Keutia	*Naja naja*
Chandrabora	*Vipera sp.*
Danras	*Natrix sp.*
Dhemna	*Pryas mucosus*
Loudoga	*Dendrelaphis tristis*
Mete	*atretium schistosum*

Annexure V: Approved Manpower of **Junglemahal Zoological Park**

Sl.No.	Name of Post	Sanctioned Strength	Existing Strength	Requirement
1	Director/ DCF	1 (Ex-officio)	1 (Ex-officio)	
2	Assistant Director	1	1	
3	Forest Range Officer	0	1	
4	Veterinary Officer	1	-	1
5	Zoo Biologist	1	-	
6	Zoo Supervisor	1	-	
7	Garden Supervisor	1	-	
8	Sanitary Supervisor	1	-	
9	Education Assistant	1	-	
10	Asst. Security/ Estate Supervisor	1	-	
11	Veterinary Assistant	1	-	
12	Asst. Zoo Supervisor	2	-	
13	Gate Keeper	1	-	1
14	Driver	1	-	
15	Zoo Keeper	8	-	8
16	UDC/OA/TA	1	-	
17	LDC	1	-	1
18	Ticket Clerk	1	-	
	Total Permanent Staff/ Officer	24	2	11
Support Staff (Engaged on contractual basis against permanent post)				
1	Veterinary Officer	1	0	1
2	Zoo Superintendent	1	1	
3	Office Assistant	1	1	
4	Veterinary Assistant	1	1	
5	Ticket Clerk	1	1	
6	Zoo Keeper	2	2	
	Total	7	6	
Support Staff (Sanctioned contractual post)				
	Research Assistant	1	-	1
	Security Guard	12	9	3
	Sanitation Attendent	6	2	4
	Garden Attendent	6	2	4
	Attendent	8	-	4
	Animal Attendent	10	3	7
	Total	43	16	23

Annexure VI (a): List of Animal Enclosures

Animal enclosure list under Jungle mahal Zoological park, Jhargram

Sl No.	Enclosures Name	Qty
1	Flying Birds Aviary	1
2	Pheasants 1	1
3	Pheasants 2	1
4	Pheasants 3	1
5	Emu	1
6	Fishing Cat	1
7	Jungle Cat	1
8	Leopard Cat	1
9	Indian Wolf	1
10	Leopard	1
11	Bengal Fox	1
12	Striped Hyena	2
13	Jackal	1
14	Crocodile	1
15	Sloth Bear	1
16	Macaque 1	1
17	Macaque 2	1
18	Macaque 3	1
19	Macaque 4	1
20	Rescue Centre for Languor	2
21	Spotted Deer	1
22	Barking Deer & Sambar Deer	1
23	Reptile House	1
24	Turtle spotted pond	1
25	Tricarinate hill turtle	1
26	Tortoise	1
27	Elephant Pilkhana	1
28	Old flying bird aviary	1
29	Nilgai	1
30	Large Indian Civet	1
31	Water Monitor Lizard	1
32	Pangolin	1
33	Herbivore quarantine centre	1

Annexure VI (b): List of Buildings/Structures Other than Animal Enclosures

List of Building and Structure under Junglemahal Zoological park, Jhargram

Sl.No	Name Of Building
1	Administrative Building
2	Nature Interprepation Centre
3	Vetanary Hospital
4	Canteen
5	Kitchan Go-down
6	Zoo Super Quarter
7	Two in Barak
8	Carnivore Treatment Room
9	Postmortem Room
10	Overhead water storage tank 1 (Near spotted deer enclosure)
11	Submersible pump house 1
12	Overhead water storage tank 2 (Near kitchen go-down)
13	Submersible pump near kitchen go-down
14	Elephant keeper room
15	Ticket Counter (Near Main entry gate)
16	Seceurity Room (Near Admin building gate)
17	Submersible pump house 2 (On the way of zoo quarter)
18	Ambulance shed (Front of Administrative Building)
19	Toilet Block 1(Near entry gate of visitors)
20	Toilet Block 2 (Near old flying bird aviary)
21	Toilet Block 3 (Near Fishing cat enclosure)

Annexure VII (a): Notification Regarding Formation of West BengalZoo Authority

Annexure - I

Registered No. WB/SC-247 No. WB(Part-I)/2009/SAR-314

The

Kolkata Gazette

Extraordinary

Published by Authority

BHADRA **SATURDAY, AUGUST 29, 2009** **[SAKA 1931]**

PART I-- Orders and Notifications by the Governor of West Bengal, the High Court, Government Treasury, etc.

GOVERNMENT OF WEST BENGAL
DEPARTMENT OF FORESTS
WRITERS' BUILDINGS
KOLKATA - 700 001

NOTIFICATION

No. 3382-For, Kolkata, the 27th August, 2009 – WHEREAS the State Government is not satisfied with the functioning of the Honorary Committee of Management ("hereinafter referred to as the said Managing Committee") of the Zoological Garden, Alipore, Kolkata : i.e - constituted, by notification No.4668-For/I-M-27/2002, dated the 22nd November, 2005, (hereinafter referred to as the "said notification ") in pursuance of rule as read with rule 3, of the Alipore Zoological Garden (Management) Rules, 1957;

AND WHEREAS it has been considered expedient to form the Zoo Authority of West Bengal (hereinafter referred to as the "said Authority") for the management of, inter alia, the Zoological Garden, Alipore, Kolkata;

AND WHEREAS it has further been considered expedient to –
(i) rescind the said notification and do away with the said Managing Committee, and
(ii) vest, till the formation of the said Authority, the management of the Zoological Garden, Alipore, Kolkata in the State Government,
with immediate effect;

NOW, THEREFORE, the Governor is pleased hereby to –
(i) rescind the said notification and do away with the said Managing Committee, and
(ii) vest, till the formation of the said Authority, the management of the Zoological Garden, Alipore, Kolkata in the State Government,
with immediate effect;

By Order of the Governor,

P. D. BANDYOPADHYAY
Joint Secretary in the Government of West Bengal
Department of Forests

Published by the Controller of Printing and Stationery, West Bengal and printed at Saraswaty Press Ltd.

Annexure VII (b): Notification regarding transfer of Zoological Parks of the State under the Management Control of the West Bengal Zoo Authority

ANNEXURE - VIII c

Government of West Bengal
Department of Forest
FOR Branch
Writers' Buildings, Kolkata – 1

No. 747-For **Dated Kolkata the 3rd April, 2012**

NOTIFICATION

The Governor is pleased to order that the following 11 (eleven) Zoological Parks are herby brought under the management control of the West Bengal Zoo Authority and the concerned Divisional Forest Officers as mentioned below against the Divisions are hereby designated as "Ex-officio Director" of the concerned zoos and they are hereby authorized to manage the concerned zoos and manage the funds of West Bengal Zoo Authority through separate bank accounts to be opened in the name of West Bengal Zoo Authority with immediate effect and until further orders.

The Governor is also pleased to order that the said "Ex-officio Director" will submit the report relating to the zoo matters directly to the West Bengal Zoo Authority with an intimation to the Department of Forests.

Sl. No.	Name of the Zoos	Forest Division
1.	Adina Deer Park	Malda
2.	Gar Chumuk Deer Park	Howrah Social Forestry
3.	Jhargram Deer Park and Mini Zoo	Jhargram
4.	Kumari Khansabuti Deer Park	Bankura (South)
5.	South Khairbari Rescue Centre	Wildlife III
6.	Kunjanagar Eco-Park	Wildlife III
7.	Animal Rescue Center at Surulia	Purulia
8.	Ramnabagan Mini Zoo	Burdwan
9.	Rasikbeel Deer Park and Mini Zoo	Coochbehar
10.	Bochamari Gharial Rescue Centre	Coochbehar
11.	Jharkhali Satellite Zoo	24 Parganas (South)

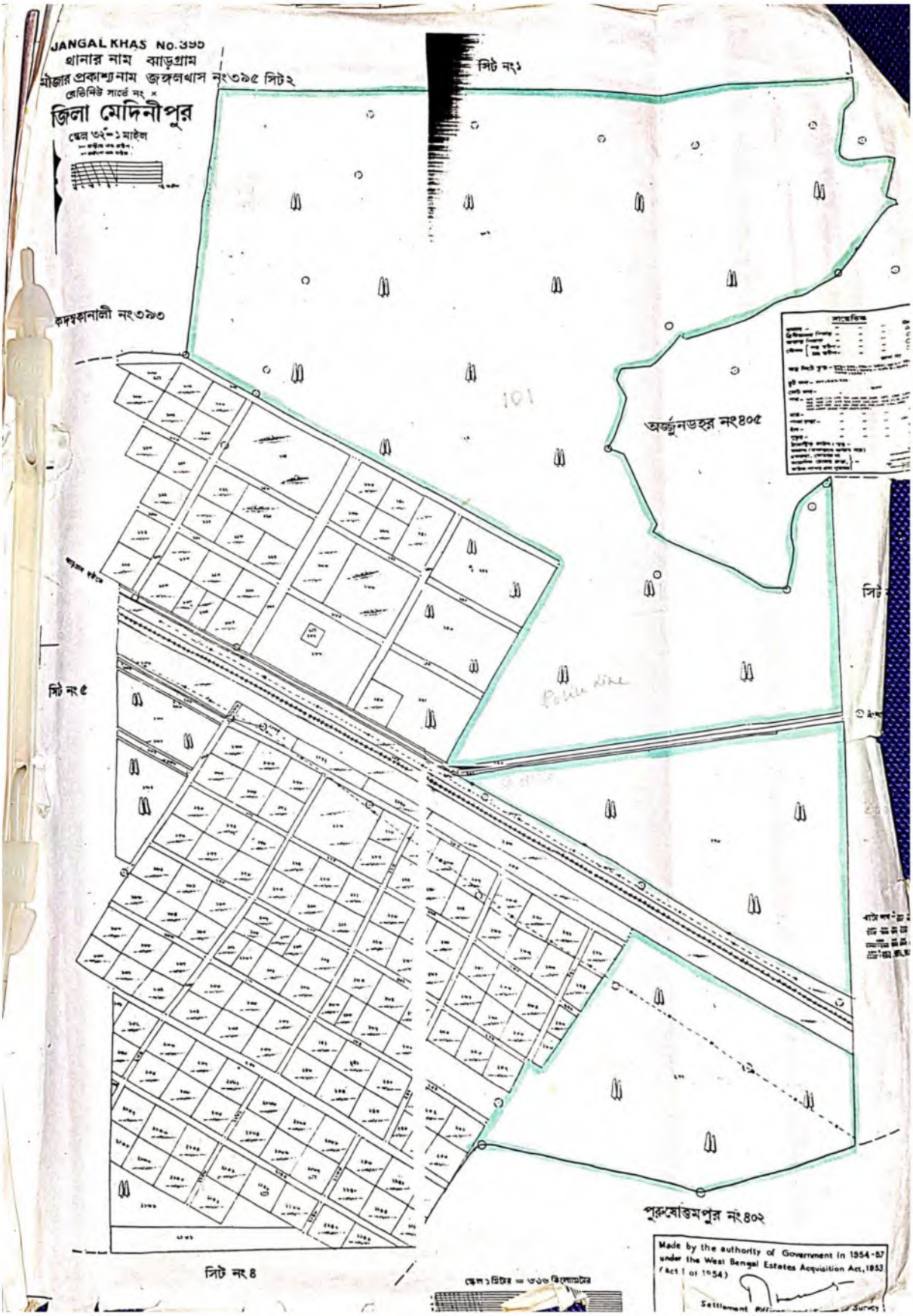
By order of the Governor
sd/—
(P.D. Bandyopadhayay)
Additional Secretary to the
Govt. of West Bengal

No. 747/1-For **Dated Kolkata the 3rd April, 2012**

Copy forwarded for information to the Pr. A.G. (A&E), West Bengal

sd/—
Additional Secretary to the
Govt. of West Bengal

Annexure VIII: Legal Status of Land



P-7

Government of West Bengal
Directorate of Forests
Office of the Divisional Forest Officer
West Midnapore Division
_____

No. 2470 / 28-10 ; Dated, Jhargram, the 11/06/98.

To
The District Magistrate,
Midnapore.

Sub : Transfer of land of Refujee Relief & Rehabilitation Department for extension of Deer Park cum Animal Rescue Centre, Jhargram.

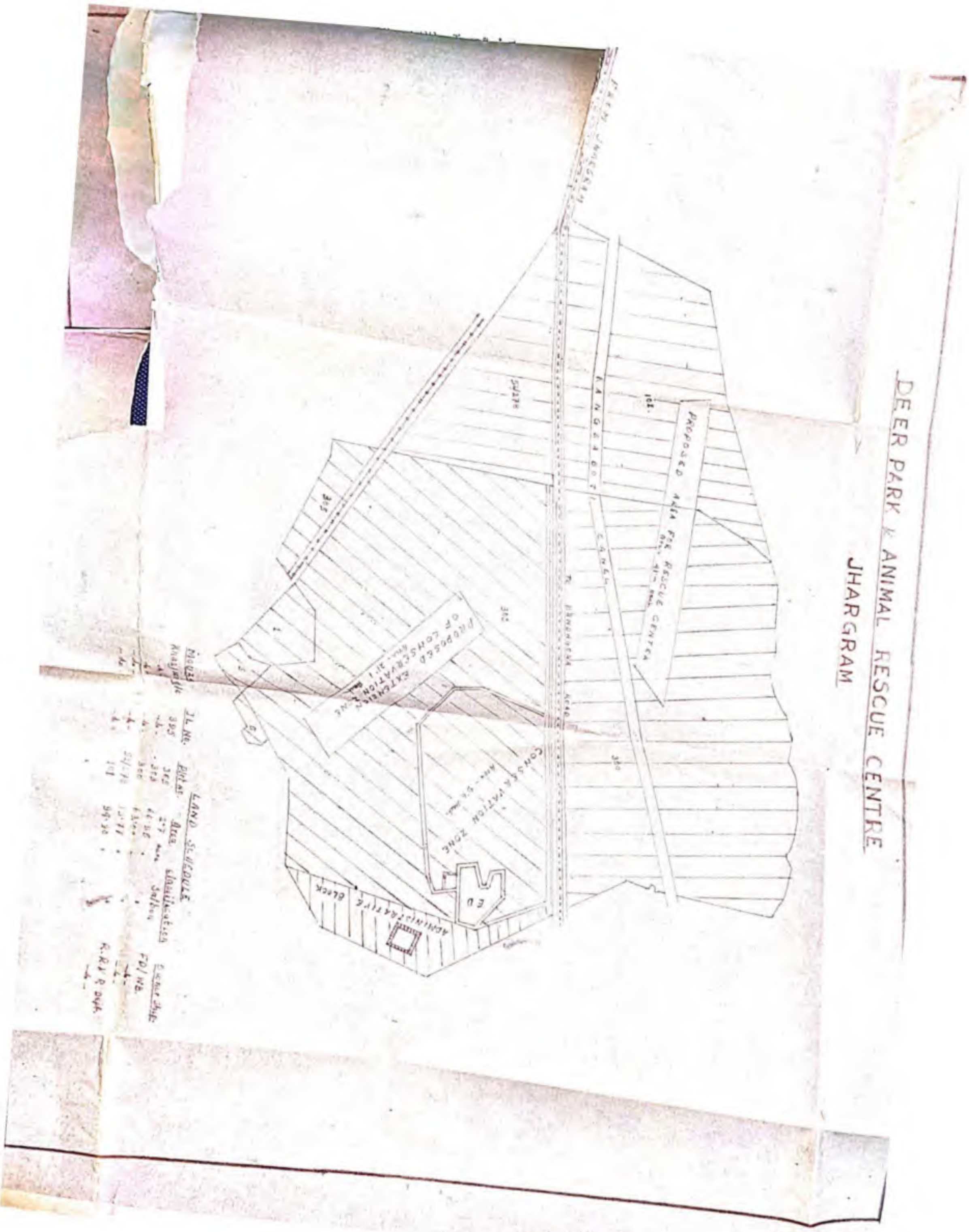
Ref : Your Memo No. 28/R.R.&R., dt. 20.2.98.

With reference to your memo no. quoted above, enclosed please find herewith xerox copy of all papers relation to the land of R.R.&R. Department being occupied for the purpose of Deer Park cum animal rescue centre, Jhargram.

Enclo:- 22 nos.
& one map.

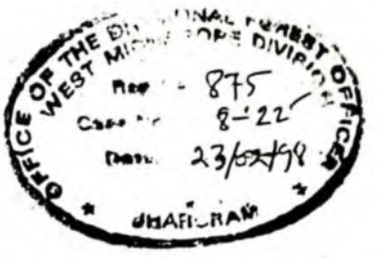
Divisional Forest Officer,
West Midnapore Division.

tkg/


DEER PARK & ANIMAL RESCUE CENTRE
JHARGRAM
PROPOSED AREA FOR RESCUE CENTRE
CONSERVATION ZONE
PROPOSED EXTENSION OF CONSERVATION ZONE
ADMINISTRATIVE BLOCK
LAND SCHEDULE

GOVERNMENT OF WEST BENGAL,
Office of the District Magistrate, Midnapore.
Refujee Relief & Rehabilitation Department.

Memo No. 28 / R.R.&R Dated 20.2.98



e Divisional Forest Officer,
st Midnapore Division,
P.O. Jhargram
st. Midnapore.

b:- Transfer of land of Refujee Relief & Rehabilitation Department for extention of Deer Park cum animal rescue Centre,Jhargra.

s:- His Memo No. 727/28-10 dated 6.3.97.

He is requested to furnish all papers relation to the land R.R.&R Department being occupied for the purpose of Deer Park n animal rescue Centre,Jhargram immediately for taking further tion from this end.

19/2/98
for District Magistrate,
Midnapore.

19/2/98

o No. /1 R.R.&R Dated

Copy forwarded to the District Land & Land Reforms Officer, dnapore for favour of information.

for District Magistrate,
Midnapore.

-9

Government of West Bengal
Directorate of Forests
Office of the Divisional Forest Officer
West Midnapore Division.

No. ____/____ : Dated, Jhargram, the ____/1996.

To
Mr. S. Suresh Kumar, I.A.S.,
District Land & Land Reforms Officer,
Midnapore.

Sub : Transfer of land.

Ref : This office No. 2332/8-4, dated- 28.06.96 &
Your No. 29009/B-88(34)/95, dated- 04.08.95.

It might have been known to you that one Deer Park cum animal rescue centre is situated at Jhargram. This Deer Park will soon be declared as Wild Life Sanctuary under provision of Wild Life (Protection) Act. 1972 for which the present deer park area is to be extended for effective protection & management of Wild Life.

Refugee Rehabilitation Department has got an un-utilized area of 110.67 acre which is covered by very good Sal crop and its associates with a look of natural forest and is contiguous and adjacent to the deer park. It is intended that this area will also be included within the sanctuary area.

You are, therefore, requested to kindly take necessary action to transfer the land in favour of Forest Department from Refugee Rehabilitation Department immediately, so as to declare this patch as Reserve forest and include this within the purview of the deer park and Animal Rescue Centre.

Land Schedule :-

Block	Mouza	J.L.No.	Plot No.	Area	Classification	Possession
Jhargram	KJ	395	52/278	15.77 Ac.	Salban	R.R. Dept.
Jhargram	KJ	395	101	94.90 Ac.	Salban	R.R. Dept.

An immediate action is requested.

Enclo : Map of the proposed area.

Divisional Forest Officer,
West Midnapore Division.

Contd...p/2...

No. ——— / ——— : Dated, Jhargram, the ——— /1996.

Copy forwarded to :-

1) Karmadhakshya, Bon-O-Bhumi Sanskar Sthayee Samity, Midnapore Zilla Parishad for information. He is requested to kindly look into the matter so that the land may be transferred in favour of Forest Department as early as possible.

2) Sabhapati, Jhargram Panchayet Samity for information and necessary action.

3) B.L.L.R.O., Jhargram for information and necessary action.

4) Chief Wild Life Warden, West Bengal for information.

5) Conservator of Forests, Western Circle, West Bengal for information.

Divisional Forest Officer,
West Midnapore Division.

tkg/

Government of West Bengal
Directorate of Forests
Office of the Divisional Forest Officer,
West Midnapore Division.

No. / , Dated, Jhargram, the /1998.

To
The District Magistrate,
Midnapore.

Sub : Transfer of Land of Refugee Relief and Rehabilitation Department for extention of Deer Park cum Animal Rescue Centre at Jhargram.

Ref : Your Memo No. 126/1(2)/RR & R , dt. 05.08.98.

Sir,

Deer Park is situated at a distance of about 4 Km. from Jhargram town and is a tourist attraction. It houses many introduced animals besides deer and has the status of a 'Mini Zoo' conferred by the Central Zoo Authority. It is situated over an area of 35 ha.

Adjascent and contiguous with the deer park is the thick Sal jungle on plot Nos. 101 and 52/278 of Jungle Khas, J.L.No. 395 which is under the control of Refugee Relief and Rehalilitation Department, measuring an area of total 110.67 Ac. . The schedule of the land is as follows :-

Block.	Mouza.	J.L.No.	Plot No.	Area.	Classification.	Ownersh
Jhargram.	KJ.	395	52/278	15.77 Ac.	Sal ban.	R.R. & R Deptt.
Jhargram.	KJ.	395	101	94.90 Ac.	Sal ban.	-do-

(Total Area - 110.67 Acres).

It is reliably learnt that a part of this land is leased for a period of 99 years to M/S Thakuria Engineering Corporation, Calcutta during 1966 for the rehabilitation of refugees. but the land remains unutilized by them till date and a thick sal jungle exists on it. Also they cannot otherwise utilize the land due to the provisions of Forest Conservation Act, 1980.

In view of the fact that the deer park adjacent to Jhargram is a tourist attraction and the department of forests is having plans to improve the deer park by introducing more animals and by constructing open air enclosures for black bear, Foxes and other animals, it is requested that suitable steps may be initiated at your end for a formal transfer of the 110.67 Acres of land from R.R. & R Deptt to the Forest Department at the earliest.

Contd...P-2.....

DCF/

No. :
Map showing the proposed area for transfer.
Land schedule of the proposed area for transfer.
Copies of earlier correspondence with regard to this land for your kind perusal.

Divisional Forest Officer,
West Midnapore Division.

3813 (1) 128-10 , Dated, Jhargram, the 14 SEP 1998/1998.

Copy forwarded to the District Land & Land Reforms Officer, Midnapore for information and necessary action at his end.

Divisional Forest Officer,
West Midnapore Division.

LAND SCHEDULE

J.L.No.	Plot No.	Area.	Classification.	Ownership.
395	305	2.70 Ac.	Sal ban.	Forest Deptt.
395	303	66.95 Ac.	-do-	-do-
395	300	63.00 Ac.	-do-	-do-
395	52/278	15.77 Ac.	-do-	R.E. & F. Deptt.
395	101	94.90 Ac.	-do-	-do-

Government of West Bengal
Directorate of Forests

No. 4605 / 28-10 ,Dated,Jhargram, 29/12/98

To :- The District Magistrate,
Midnapore.

Ref :- Your No. 2106/DM Dt. 14.12.98.

.....

Sir,

With reference to Smt. Maneka Gandhi, Minister of State for Social Justice and Empowerment, Govt. of India, New Delhi's No. nil Dt. 30.11.98, this is to inform you that the Jhargram Deer Park situated at Jhargram has been recognised by the Central Zoo Authority as mini zoom. It is true that three sloth bears(two female and one male) are presently housed in a small enclosure. A proposal has already been initiated for shifting the bears to a large moated enclosure. As there is shortage of land for the construction of large moated enclosure, a proposal has been initiated for the transfer of 25 acres of land in R.S.Plot No. 278 and 101 of Refugee Relief and Rehabilitation Department, to the Forest Department. In this connection, the Additional District Magistrate(RR) has already written to the Secretary, Refugee Relief & Rehabilitation Department,Govt. of West Bengal,Calcutta,recommending the transfer of land vide his Memo. No. 126/1(2)/R R & R Dt, 5.8.93.As soon as the land is transferred to the Forest Department, the work may be taken up for the construction of large moated enclosure.

Correspondence is also being made with the Chief Wild Life Warden, West Bengal and the Conservator of Forests,Western Circle, West Bengal, for providing fund for the construction of large moated enclosure at Jhargram Deer Park.

This is for your information and necessary action. Any future development in this regard will be intimated to you.

Yours faithfully

DIVISIONAL FOREST OFFICER,
WEST MIDNAPORE DIVISION.

No. / ,Dated,Jhargram,

Copy forwarded to the Additional District Magistrate(R R), Midnapore,for information with reference to his No.126/1(2)/RR & R dt. 5.8.93.

DIVISIONAL FOREST OFFICER,
WEST MIDNAPORE DIVISION.

N.V.R./TKGH.

Government of West Bengal
Directorate of Forests
Office of the Divisional Forest Officer
West Midnapore Division.

No. / ,Dated,Jhargram,

To :- The District Land & Land Reforms Officer,
West Midnapore.

Sub :- Transfer of Land.

.....

There is a Deer Park in the eastern side of Jhargram town.The Deer Park has been accorded Mini Zoo status by the Central Zoo Authority.There is scope of improvement of the Deer Park but the small area of the said Park becomes a limiting factor.

Refugee,Relief & Rehabilitation Department got an untilised area of 110.67 acres adjoining to Deer Park.The area is also covered by very good sal forests.It would be of great help for expansion of the Deer Park if this chunk of land is transferred from Refugee,Relief and Rehabilitation Department to Forest Department.

You are,therefore, requested to kindly take necessary action and arrange to transfer the land.The land schedule of the land is given below.The map of the area to be transferred is also enclosed herewith.

Block	Mouza	J.L.No.	Plot No.	Area	Classification.	Possession.
Jhargram	K.J.	395	52/278	15.77 ac.	Salban	R.R.& R. Department.
Jhargram	K.J.	395	101	94.90 ac.	Salban	R.R.& R. Department.

Enclo:One Map.

DIVISIONAL FOREST OFFICER,
WEST MIDNAPORE DIVISION.

No. 366(2)/28-10 . ,Dated,Jhargram, 04 FEB 2002

Copy forwarded for information to:-

1. Shri Nurul Islam,Karmadhaksyha,Dan-O-Bhumi Sanskar Sthaye Samiti, Midnapore Zilla Parishad. This has a reference to our discussion taken in the last meeting of Dan-O-Bhumi Sanskar Sthaye Samiti.

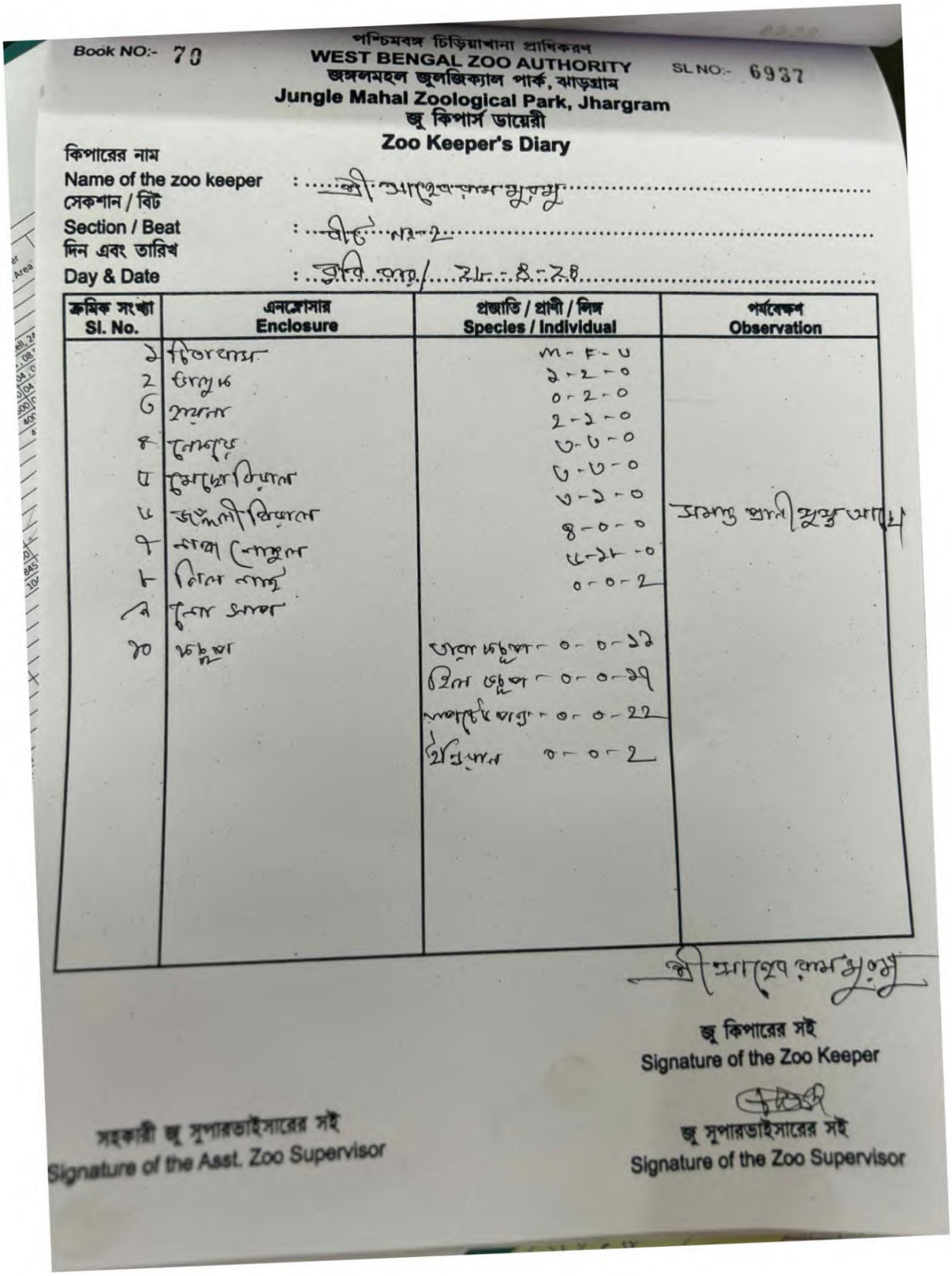
2. The Conservator of Forests,Western Circle,West Bengal.

DIVISIONAL FOREST OFFICER,
WEST MIDNAPORE DIVISION.

D.R./TKGH.

Annexure IX: Format of Record Keeping at Junglemahal Zoological Park

Annexure IX (a): Keeper's Diary



Book NO:- 70

পশ্চিমবঙ্গ চিড়িয়াখানা প্রাধিকরণ
WEST BENGAL ZOO AUTHORITY
জঙ্গলমহল জুলজিক্যাল পার্ক, ঝাড়গ্রাম
Jungle Mahal Zoological Park, Jhargram

SL NO:- 6937

জু কিপার্স ডায়েরী
Zoo Keeper's Diary

কিপারের নাম
Name of the zoo keeper : শ্রী আবুল কাশেম মুরমু

সেকশান / বিট
Section / Beat : বীট নং-2

দিন এবং তারিখ
Day & Date : বুধবার / 21-8-24

ক্রমিক সংখ্যা Sl. No.	এনক্লোসার Enclosure	প্রজাতি / প্রাণী / লিঙ্গ Species / Individual	পর্যবেক্ষণ Observation
১	চিতাবাঘ	M - F - U	
২	ভাল্লুক	১-১-০	
৩	হায়না	০-২-০	
৪	নেকড়ে	২-১-০	
৫	হিমালয়ান বিড়াল	৩-৩-০	
৬	জঙ্গলী বিড়াল	৩-৩-০	
৭	সাদা শেয়াল	৩-১-০	সকল প্রাণী সুস্থ আছে
৮	লাল শেয়াল	৪-০-০	
৯	লাল কাঠবিড়ালী	৫-২১-০	
১০	খরগোশ	০-০-২	
		ডোরা ছাগল - ০-০-১১	
		চিতা ছাগল - ০-০-৩৭	
		সাদাচিতি হরিণ - ০-০-২২	
		হরিণ ০-০-২	

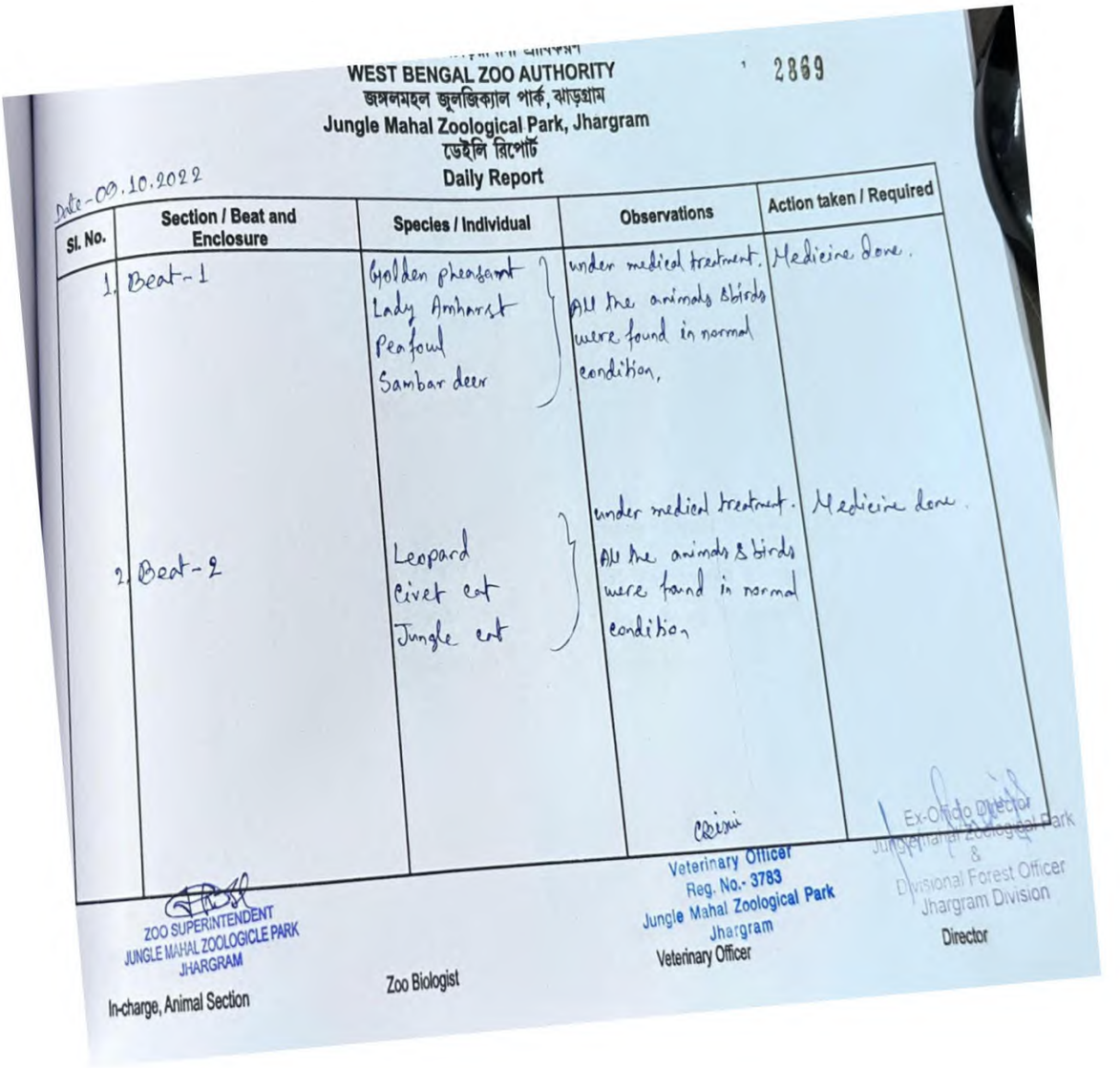
শ্রী আবুল কাশেম মুরমু

জু কিপারের সই
Signature of the Zoo Keeper

সহকারী জু সুপারভাইসারের সই
Signature of the Asst. Zoo Supervisor

জু সুপারভাইসারের সই
Signature of the Zoo Supervisor

Annexure IX (b): Daily Report



WEST BENGAL ZOO AUTHORITY
জঙ্গলমহল জুলজিক্যাল পার্ক, ঝাড়গ্রাম
Jungle Mahal Zoological Park, Jhargram
ডেইলি রিপোর্ট
Daily Report

2869

Date - 09.10.2022

Sl. No.	Section / Beat and Enclosure	Species / Individual	Observations	Action taken / Required
1.	Beat-1	Golden pheasant Lady Amharst Peafowl Sambar deer	under medical treatment. All the animals & birds were found in normal condition,	Medicine done.
2.	Beat-2	Leopard Civet cat Jungle cat	under medical treatment. All the animals & birds were found in normal condition	Medicine done.

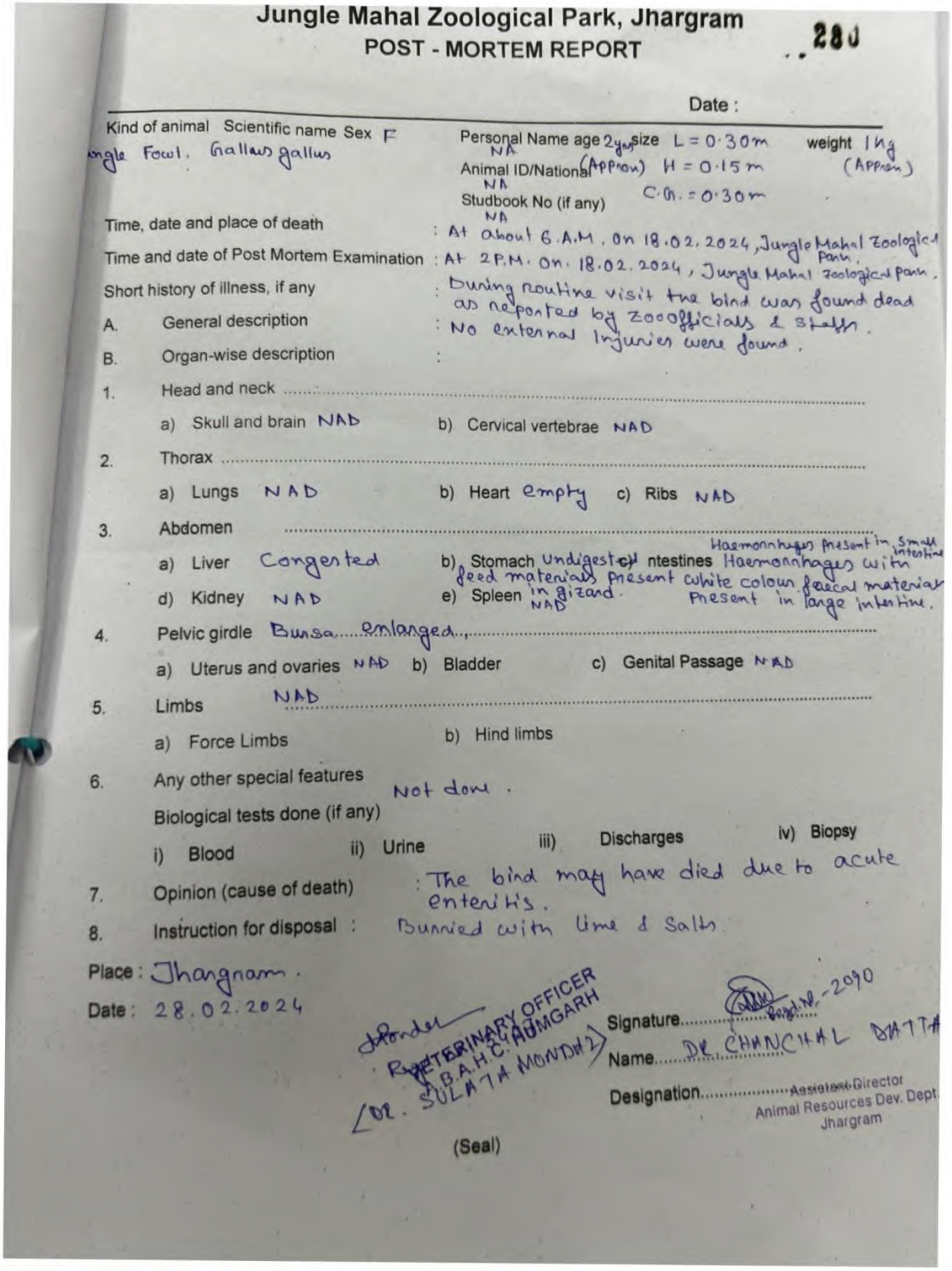
ZOO SUPERINTENDENT
JUNGLE MAHAL ZOOLOGICLE PARK
JHARGRAM
In-charge, Animal Section

Zoo Biologist

Veterinary Officer
Reg. No.- 3783
Jungle Mahal Zoological Park
Jhargram
Veterinary Officer

Ex-Officio Director
Jungle Mahal Zoological Park
&
Divisional Forest Officer
Jhargram Division
Director

Annexure X (c): Post Mortem Report



Jungle Mahal Zoological Park, Jhargram
POST - MORTEM REPORT

..280

Date :

Kind of animal Scientific name Sex F
ungle Fowl. Gallus gallus

Personal Name age 2yrs size L = 0·30m weight 1kg
NA (Approx) H = 0·15m (Approx)
Animal ID/National C.G. = 0·30m
Studbook No (if any)
NA

Time, date and place of death : At about 6.A.M. On 18.02.2024, Jungle Mahal Zoological Park.

Time and date of Post Mortem Examination : At 2P.M. On. 18.02.2024, Jungle Mahal Zoological Park.

Short history of illness, if any : During routine visit the bird was found dead as reported by zoo officials & staffs.

A. General description : No external injuries were found.

B. Organ-wise description :

1. Head and neck .....
   a) Skull and brain NAD b) Cervical vertebrae NAD
2. Thorax .....
   a) Lungs NAD b) Heart empty c) Ribs NAD
3. Abdomen .....
   a) Liver Congested b) Stomach Undigested ntestines Haemorrhages present in small intestine Haemorrhages with feed materials present white colour faecal material present in large intestine.
   d) Kidney NAD e) Spleen NAD in gizard.
4. Pelvic girdle Bursa enlarged .....
   a) Uterus and ovaries NAD b) Bladder c) Genital Passage NAD
5. Limbs NAD .....
   a) Force Limbs b) Hind limbs
6. Any other special features Not done.
   Biological tests done (if any)
   i) Blood ii) Urine iii) Discharges iv) Biopsy
7. Opinion (cause of death) : The bird may have died due to acute enteritis.
8. Instruction for disposal : Burried with lime & Salts

Place : Jhargram.
Date : 28.02.2024

Signature.....
Name.....DR. CHANCHAL DATTA
Designation.....Assistant Director
Animal Resources Dev. Dept.
Jhargram

VETERINARY OFFICER
B.A.H.C. JHUMGARH
DR. SUJATA MONDAL

(Seal)

Annexure X (d): Animal History Card

WEST BENGAL ZOO AUTHORITY

001

JUNGLEMAHAL ZOOLOGICAL PARK, JHARGRAM

ANIMAL HISTORY CARD

Vernacular (local) Name & Common Name: wolf-6 Indian wolf.	Scientific Name of the species: Canis lupus pallipes.
House name and ID number of the animal : Wolf Enclosure.	Sex: M/F F
Distinguishing mark :	Type of marking: Transponder/Ear tag/Ring/Others :
National Studbook number of the animal : —	International Studbook number of the animal: —
Sire : (Name & National Studbook number) Khuri (Indian wolf)	Dam : (Name & National Studbook number) Buro (Indian wolf)
Date of Birth (dd : mm : yyyy): 01.12.2023	When and from where acquired : Took birth at JMZP, JGM
Physical health check-up details : 1. Periodical check-up physically. 2. Stool test.	Genetic health check up details : —
Date of death or other mode of disposal (dd : mm : yyyy):	Remarks :

07.06.24
MD ARD(HRS) JGM.

07.06.2024
V.O., ABAHC, Haringhata

Date	Details of the observations	Signature of Zoo Biologist
07.06.24	Schedule deworming.	07.06.24. AD ARD (HQ) DGM. 07.06.2024 V.O., ADAHC Jhargram

Annexure X (e): Animal Treatment Card

WEST BENGAL ZOO AUTHORITY

JUNGLEMAHAL ZOOLOGICAL PARK, JHARGRAM

001

ANIMAL TREATMENT CARD

1. Card No : –
2. Common Name & Individual Name (if any) : Wolf - 6. Indian Wolf.
3. Scientific Name : Canis lupus pallipes.
4. Animal ID : N - 6
5. National Studbook No. (if any) : –
6. Sex : Female.
7. Date of Birth : 01.12.2023.
8. Date & Time of Illness : 07.06.24 05 P.M (Scheduled deworm)
9. Date & Time of Treatment : 07.06.24. 05 PM (Scheduled deworming)
10. History of Illness : NA
11. Physical details

    Body Weight : 12.5 Kg. Respiration : NAD

    Temperature : NAD Mucous membrane : NAD

    Pulse : NAD Secretion, if any : NAD

12. Physical Analysis :

    Gait : Normal. Defecation : Normal

    Urination : Normal Feeding habit : Normal.

13. Test Conducted :

    Urine : – Skin scrapings : –

    Faecal : Done Blood : –

    Biopsy : – X-ray : –

14. Other Examination : –
15. Remarks : The animal is physically Fit & free from any diseases at the time of examination.

07.06.24. 07.06.2024

Veterinary Officer

Date	Details of the observations & treatment given	Signature of Veterinary Officer
07.06.24	Schedule deworming. 1. Bandictor plus – 1 tab Sq once orally. 2. Livotol pet – 1 v. 10 ml daily orally x 10 days.	[signature] 07.06.24. [signature] 07.06.24

Annexure XI: Compliance Report of Junglemahal Zoological Park, Jhargram

Renewal of recognition of the Junglemahal Zoological Park, Jhargram under section 38H of the wild life (protection) act, 1972

CZA F. No. 19-204/93-321(CZA)(NE) Dated 22.02.2021

Sl. No.	Norm No. under RZR	Condition	Time Period to Comply
	1. General Requirements:		
1	10.1(1)	Action should be taken to transfer spotted deer housed in the zoo beyond permissible limit.	Will be complied with
2	10.1(5)	The area adjacent to habitation should also be walled as per CZA guidelines to minimise disturbances caused by human and domesticated animals.	One year
	2. Administrative and staffing pattern:		
3	10.2(1)	Post of full time in-charge of the zoo should be filled up.	One year
4	10.2(2)	Trained full time Veterinarian is urgently required. Post should be filled up.	One year
5	10.2(2) & 10.6(5)	Since zoo has been upgraded to Medium zoo, scientific and technical personnel should be posted in the zoo as applicable.	One year
	3. Development and Planning:		
6	10.3(6)	Acquisition of captive animals from other zoos may be taken up by the Zoo in accordance with approved Master Plan	One year
	4. Animal, housing, display of animals and animal enclosures:		
7	10.4(6)	Use hollow logs instead of hume pipes for enrichment	Six months
8	10.4(9)	Hedge plantation of appropriate species should be carried out between standoff barrier and enclosure barrier.	Complied with
	5. Upkeep and healthcare of animals:		
9	10.5(2)	Deep freezer facilities for storage of meat at least for two days' supply should be done.	Six months
10	10.5(2) & 10.5(3)	Meat received from market should be first taken to kitchen where it should be inspected, cleaned, disinfected, and then transported to animal enclosures in covered containers. Thereafter it should be provided to animals in thoroughly cleaned feeding trays.	Six months
11	10.5(5)	During fire season (mid-January up to May) periodically remove Sal leaves around enclosures and along external perimeter to prevent fire. Engage fire watchers to prevent fire during fire season.	One year
12	10.5(5)	A separate enclosed area is required for disposal of left-over meat by digging pits to prevent entry of small carnivores	Six months

		close to animal enclosures.	
13	10.5(5)	Covered drainage should be done to prevent wastes and water from the meat preparation facility from draining onto the ground surrounding the facility where foot traffic will carry pathogens around and where wildlife may become exposed to the waste.	Six months
	6. Veterinary and infrastructure facilities:		
14	10.6(1)	Suitable and appropriately designed holding facilities should be made for animals requiring extensive medical care	Six months
15	10.6(1)	Basic hospital and monitoring equipment should be procured.	One Year
16	10.6(1)	Basic diagnostic support should be procured to enable and make rapid assessment of physiologic status of sick and injured animals.	One Year
17	10.6(1) & 10.6(3)	Appropriate animal restraint equipment, accessories and drugs should be equipped as per norms prescribed by CZA.	One Year
18	10.6(1)	Proper storage facilities for various medicaments and chemical immobilization drugs should be made available within zoo.	One Year
19	10.6(2)	Technician is urgently required. Post should be filled up.	One Year
20	10.6(3)	Endeavour should be to have complete independent capture equipment kit for the zoo as per guidelines issued by the CZA.	One Year
21	10.6(3)	Modern well equipped post-mortem room should be constructed.	One Year
22	10.6(6)	Zoo should develop linkage and collaborative research programmes with eminent wildlife institutes as per landscape requirements.	One Year
	9. Acquisition and breeding of animals:		
23	10.9(4)	Acquire male sloth bears to pair with female sloth bears.	Six months
	10. Research activities:		
24	10.10	Research on priority issues should be started.	One year
	11. Education and outreach activities:		
25	10.11(1)	Zoo should develop conservation education programme for creating awareness among visitors.	One year
	12. Visitors' facilities:		
26	10.12(1)	Complete remaining civic facilities sat appropriate and convenient places in the zoo for visitors including physically disadvantaged persons.	One year

Ex-Officio Director,
Junglemahal Zoological Park, &
& Divisional Forest Officer, Jhargram
Directorate of Forests,
West Bengal