



ZOO AUTHORITY OF KARNATAKA
(Department of Forest, Ecology and Environment)

MASTER PLAN

2014-15 TO 2033-34



BANNERGHATTA BIOLOGICAL PARK
BENGALURU

Dr. R.Raju, IFS
Executive Director
(2011-12 to 2012-13)

DEDICATED TO MOTHER NATURE



&

PARK ANIMALS

"Darwin gave us the first glimpse of the origin of species. We know now what was unknown to all the preceding caravan of generations: that men are only fellow voyagers with other creatures in the odyssey of evolution. the new knowledge should have given us, by this time, a kinship with other fellow creatures; a wish to live and let live; a sense of wonder over the magnitude and duration of the biotic enterprise."

Aldo Leopold
(A Sand Country Almanac)



GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT, FORESTS & CLIMATE CHANGE
Central Zoo Authority



F. No. 19-80/92-CZA(125)(Vol. IX)(M) / 6414

DATE: 10.12.2014

✓ To

Executive Director
Bannerghatta Biological Park
Bengaluru

Sub:- Master Plan of the Bannerghatta Biological Park, Bengaluru.

Ref:- (i) This office letter No. 19-80/92-CZA(125)(Vol. IX)(M)/5417 dated 24/30.07.2014.
(ii) PCCF (WL) & CWLW, Karnataka letter No. PCCF (WL)/F/Master Plan/CZA/2013-14 dated 1-08/09/2014.

Sir,

Reference is invited to the above cited correspondence.

The Master Plan of the Bannerghatta Biological Park, Bengaluru was scrutinized by Expert Group on Zoo Designing of the Central Zoo Authority in its Meeting held on 5th June, 2014 and the same was placed before 70th Meeting of the Technical Committee held on 1st July, 2014 for its approval. The Technical Committee of the Central Zoo Authority had approved the Master Plan of the Bannerghatta Biological Park, Bengaluru subject to the condition that:-

- (c) the responsibility of mobilizing the financial resources for implementation of the Master Plan will be the sole responsibility of the State Government or respective Zoo Operator, and
- (d) the State Government or respective Zoo Operator should quantify the resources available for the implementation of Master Plan.

A signed copy of the Master Plan is followed for taking up the various development activities accordingly.

Yours faithfully,

(B. S. Bonal)

Member Secretary

Encl: Signed Master Plan


Copy to the Principal Chief Conservator of Forests (WL) and Chief Wildlife Warden, Government of Karnataka, Bangalore for favour of information & necessary action **(with enclosure)**.


(B. S. Bonal)

Member Secretary

CERTIFICATE

This is to certify that the Master Plan (2014-15 to 2033-34) for Scientific and long term Management of the Bannerghatta Biological Park, Bannerghatta, Bengaluru, has been prepared by the Executive Director, Bannerghatta Biological Park, Bengaluru in consultation with the Expert Group on Zoo Designing of Central Zoo Authority (CZA) and Chief Wildlife Warden, Karnataka.


Executive Director
Bannerghatta Biological Park
Bannerghatta, Bengaluru


Addl. Principal Chief Conservator of
Forests & Member Secretary,
Zoo Authority of Karnataka
Mysuru


Principal Chief Conservator of
Forests (Wildlife)
& Chief Wildlife Warden,
Government of Karnataka

Master Plan is approved subjected to the condition that the responsibility of mobilizing the financial resources for implementation of the Master Plan will be sole responsibility of Bannerghatta Biological Park, Bengaluru.


15/12/14

(B.S. BONAL)
Member Secretary
Central Zoo Authority
(Ministry of Environment & Forests)
Govt. of India, New Delhi

B. S. BONAL, IFS
Member Secretary
Central Zoo Authority
Ministry of Environment, Forests & Climate Change
Govt. of India, New Delhi-110001

FORWARD

Bannerghatta Biological Park is an old establishment and an important eco tourism destination in the state. This park was established during 1974 in a very modest way as a “picnic corner” to provide recreation to nature lovers. It’s close proximity to Bengaluru has given tremendous scope for multi dimensional development and as a result this, the park has grown to the status of a “Large Zoo” in the nation as per recognition of Central Zoo Authority, New Delhi. The park is located at the confluence of Western and Eastern Ghats and thus constitutes an ecological bridge housing both flora and fauna unique to this landscape. Bannerghatta Biological Park has been an integral part of Bannerghatta National Park managed under common management plan till 2002. It was only during this period the dynamics of zoo science was comprehended by the managers and as a result the Biological Park was separated from National Park for the planned and scientific management. Since its inception, the park had adopted progressive and flexible policies for the development and management on fast track basis.

I am very delighted to know that the Central Zoo Authority has approved the Master Layout Plan of Bannerghatta Biological Park, Bangalore on 03-01-2014. A comprehensive Master Plan for a period of 20 years from 2014-15 to 2033-34 submitted to Central Zoo Authority, New Delhi has already been evaluated by the Technical Committee of Central Zoo Authority. As Vice Chairman of Zoo Authority of Karnataka I had the opportunity of interacting and involving in deliberations and discussions on the master plan. The plan contains the details of the past, status of the present and vision of the future.

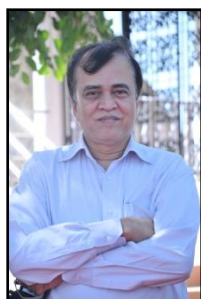
I assure that all possible assistance will be extended to obtain the grants from the Government/ any other recognized financial institutions to maintain the development as per the Master Plan.

I record my appreciation to the Executive Director and his staff for writing this practical and implementable plan. I have no doubt that Bannerghatta Biological Park would emerge as one of the world class ex-situ conservation centers, if all works and developmental activities envisaged in the plan are completed in the time as per plan.


(**Vinay Luthra, IFS**)

Principal Chief Conservator of Forests (Wildlife)
& Chief Wildlife Warden,
Government of Karnataka

PREFACE



It is very rare particularly in our country with rapid urbanization to have a natural forest in the neighborhood. Bengaluru is particularly fortunate in having the “Bannerghatta National Park”, just a few kilometers from the heart of the city. The Bannerghatta National Park is a dry deciduous forest and was notified in 1974. It had an area of 104.27 Sq. Kms. It was notified for Conservation / Tourism / Recreation purposes, the same forest area has been subsequently extended after adding more forest areas in the recent past and bringing its total area to about 245 Sq. KMs (2012).

In the late 70’s / and early 80’s a small portion of the park was apportioned as a “Picnic Corner” and was developed accordingly, by adding a few animal enclosures and safaris.

The forest area has a flora of the dry deciduous and scrub type characterized by vegetation like Zizyphus, Shorea Talura, Albizzia amara, Santalum Album, Dedrocalanus, Strictus, Boswellia Seratta. In fact earlier these forests were part of lac reserves. During 2nd World War it was a Source of fuel supply to Bengaluru. The fauna of these forests include among others, the elephants and leopards. The proliferation of these animals and the rapid urbanization has brought them in conflict with humans in recent years.

The apportioned area of the “Picnic Corner” totaling an area of 731.88 Ha. was handed over to Zoo Authority of Karnataka, in 2002 and was named as “Bannerghatta Biological Park”.

The concept of modern Zoos has been constantly evolving and has undergone drastic changes, since the time of Carl Hagenbeck who first advocated the natural display of animals, sans metal barriers. The modern Zoos have made a paradigm shift in objectives from display and recreation to centres of ex-situ conservation and conservation education for the common people. The animals so housed reflect the conservation ethos of the people. This objective is also in consonance and as enunciated in proceedings of Rio Earth Summit held in June, 1992.

At the time of taking over in 2002, the Bannerghatta Biological Park had a lot of ill planned structures and animal collections gathered over a period of time. The

institution was badly in need of modern techniques / management practices as enunciated in guidelines from Central Zoo Authority, New Delhi.

Firstly there were animal safaris which are unique to Bannerghatta Biological Park, Bangalore, which was set up in the late 1980's. These needed to be modified particularly the animal holding rooms, which were very small and cramped.

The Zoo proper again was a very old relic and the whole display was very unscientific and chaotic. It was also decided to remodel the same, and add an African display section.

The Bannerghatta Biological Park, Bangalore, is a centre for rescue and rehabilitation of circus animals which were banned for display. These are housed here and their upkeep is funded and monitored by the Central Zoo Authority. The centre has a few aging lions and tigers and with passage of time the centre is likely to fall increasingly vacant.

There is also the fact that all over Karnataka man-animal conflict is on the increase and the animals so rescued by Karnataka Forest Department, have to be housed and the above facility on falling vacant can be utilized particularly for mega carnivores.

Similarly rescued dancing kalandar bears and wild rescued bears need to be housed. Therefore an NGO called Wildlife SoS has been involved in the same.

Since Bannerghatta Biological Park is called "Biological Park" to encourage education / awareness in the smaller less glamorous but equally important species, a Butterfly park was established in 2005 along with breeding labs. This park needs to be upgraded badly and needs to look into shortage of technical staff.

The Central Zoo Authority has identified a lot of endangered species which have been identified and have brought under a conservation breeding programme. For this a separate area has been set apart and the same has to be implemented.

The park is very close to the city and is visited by thousands and especially in weekends this crowd needs to be educated meaningfully and also to fulfill all other criteria and futuristic objectives / development agenda of Central Zoo Authority, New Delhi, this plan was written.

The original layout plan was prepared by Dr. R. Raju, IFS., and approved by Central Zoo Authority and the same has been scripted in great detail by Dr. R. Raju,

IFS. The laborious efforts put in by him needs to be appreciated. This plan is a vast improvement over the plan prepared by Sri B.M.T. Rajeev, IFS., in 2003 and this plan has to be implemented from 2014-15 to 2033-34. To implement the same the necessary resources both in terms of finances and man-power has to be mobilized using innovative methods. Along with this we have to give sufficient attention to technical / managerial / veterinary inputs. I am sure that once this plan is implemented Bannerghatta Biological Park will stand apart from other institutions.



(R.S. Suresh, IFS.,)

Additional Principal Chief Conservator of Forests
and Member Secretary,
Zoo Authority of Karnataka
Mysore.

PROLOGUE



The earth summit of Rio De Janerio held during 1992 adopted various resolutions on conservation of nature and its resources for the future of mankind. Article 9 of Biodiversity Convention in the said summit explains the methods and methodologies in ex-situ conservation. The summit further resolves that every participating country shall, as far as possible and as appropriate, and predominantly for the purpose of complimenting in-situ measures adopt for the ex-situ conservation of components of biological diversity preferable in the country of origin of such components. Therefore IUCN affirms that a goal of conservation is the maintenance of existing genetical diversity and viable population of all taxa in the wild.

The reality of the current situation is that, it will not be possible to ensure the survival of an increasing number of threatened taxa without effectively using a diverse range of complementary conservation approaches. The decisions to implement an ex-situ conservation programme as part of a formalized conservation management and recovery plan will depend on the status of extinction and conservation needs. In order to maximize the full potential in conservation, ex-situ facilities and their cooperative networks should adopt the guidelines defined by the Convention on Biological Diversity (CBD). IUCN recognize the considerable set of resources committed worldwide to ex-situ conservation by the world zoological and botanical gardens, gene banks and other ex-situ facilities. The effective utilization of these resources represents an essential component of conservation strategies at all levels.

The role of zoos and zoological gardens as repositories of wildlife and centre for sensitizing people for wildlife conservation was recognized by the Indian Board for Wildlife in its very first meeting in 1952. The board recommended for setting up of modern zoological park in major cities of the nation.

A taxon specific conservation plan may involve a range of ex-situ objectives, including short, medium and long term maintenance of ex-situ stocks. This will facilitate for multi dimensional approach for conservation including reproduction, gene bank, applied research and reintroduction into the wild.

The amendment to the Wildlife (Protection) Act, 1972 have provided the scope for incorporation of rules for the management of ex-situ conservation in the country through a stipulation called Recognition of Zoo Rules, 1992. The preparation

of master plan for the development of zoos and parks is a statutory requirement under Rule 10 (51) of the Recognition of Zoo Rules, 1992 of Central Zoo Authority. Further to give proper direction and thrust to the management of zoos in the country the National Zoo Policy 1998, was framed and adopted in the year 1998.

The general account of faunal survey in the nation presently reveals the existence of around 400 species of mammals, 1200 species of birds, 350 species of reptiles and 30000 species of insect and butterflies (Khajuria, 1957). The IUCN red data book gives an account of 600 species are threatened with extinction, whereas the country has already lost around 200 species of mammals and birds out of their existence. Therefore, the conservation initiative is the paramount duty of every citizen, more so, it is imperative on the forest professionals who are trained for this purpose.

India has only 5% of the world's land area with 20% of world's human and 33% of cattle population. This poses a greater challenge in protection and conservation of fauna and flora in their natural habitat. Wildlife management in India is integral to main stream of forest management. The constitution of Indian Board for wildlife in 1952 was the humble beginning of scientific and systematic management of wildlife in their natural habitat. IUCN affirms that a goal of conservation is the maintenance of existing genetic diversity and viable population of all fauna and flora in the wild to ensure biological -interactions in the ecosystem. In order to maximize the full potential in conservation, ex-situ facilities and their co-operative network should adopt the guidelines defined by the convention on biological diversity (CBD). The international agenda for Zoo conservation strategy along with other guidelines and relevant legislations at national and regional levels should be respected and implemented. IUCN also recognizes the considerable set of resources committed worldwide to ex-situ conservation by the worlds zoological and botanical gardens including wildlife research facilities.

The formulation of World Zoo Conservation Strategy 1993 and establishment of Central Zoo Authority in India have opened a new avenue in the field of Zoo management in the country. The recognition of Zoo rule 1992 under rule 10 (51) mandates on the Zoos and parks to prepare a Master plan for the comprehensive development of Zoos and parks. The Zoo policy 1998 lays down a strategy for achieving the objectives and makes it statute to prepare Master plan for long term development and optimum utilization of resources.

Conservation of the existing precious bio-diversity is a responsibility of all zoos and parks are a major component of this conservation process. The role of Zoos

and parks as educators and safe place for conservation of endangered species are becoming increasingly high day by day. The Zoo Movement in India has come a long way with Zoos today becoming centres for the breeding of many endangered species, thus providing a hope for the future. Guideline on conservation breeding on endangered species and maintenance of their health protocol and stud book have ensured a scientific breeding process, which can eventually allow certain Captive bred animals to be reintroduced into the wild.

Bannerghatta Biological Park (BBP) popularly known as Bannerghatta Zoo is 42 year old. It was established in the year 1971 and notified in the year 1974 by the Government of Karnataka. From the inception many have contributed directly or indirectly for the overall growth and development of this park and I express my deep sense of gratitude to all of them including my predecessors. The Zoo which was started as a picnic corner in a modest area of around 16 Ha has now grown to the level of Biological Park of 731.88 Ha has witnessed series of changes in the last 4 decades. These changes in the form of development were not based on a definite theme and vision. The institute was allowed to grow purely on ad-hoc basis as and when the resources were available.

The establishment of Zoo Authority of Karnataka during 2000 and transferring the management of Biological Park under the fold of ZAK given a ray of hope of planned and organized development in the organization. However the establishments of lion safari during 1977 and followed by tiger safari and bear safaris in the later years were having a direction towards vision and theme. The establishment of Butterfly Park under the umbrella of BBP has given a clear idea on scientific management of this institution. The professional commitment towards the health care and welfare of sick, injured and conflict making wild animals have sensitized the management to establish rescue and rehabilitation centre within the limits of BBP. All these units together attract large crowd between 1.5 million annually and thus the park is emerged as a comprehensive eco-tourism centre within the limits of global fame Bengaluru city.

The park did not have approved management plan earlier for the integrated development of Zoo, Safari, Butterfly Park and Rescue Centre. However an attempt was made by Shri B.M.T Rajeev, IFS during 2002 in the form of wildlife management plan for Bannerghatta National Park wherein the entire Biological Park was a range. The next attempt was made by Shri Millo Tago, IFS during the year 2009. Although this draft plan was submitted to CZA during 2009 it was returned

back with an observation that the plan to be prepared on the new guidelines stated by the CZA. Until 2011 no attempts were made to prepare the master plan based on the new guideline issued by the CZA. It was during mid of 2011, I studied the draft plan prepared by Shri Millo Tago and also understood the concept on which plan to be prepared and decided to prepare the plan up fresh.

Taking the stock of the past and the need for the preparation of new Master Plan the basis document required was the surveyed maps for all the units of BBP, such as Zoo, Safari, Butterfly Park and Rescue centre. The surveying of the area preparation of maps for all the 4 different units and also for the entire area has consumed more than one year and the master layout plan for the BBP and all its 4 units were prepared. The technical committee of CZA visited the park during March 2013 have inspected all the units of BBP and perambulated entire area and have approved the Master Layout Plan of BBP and its units.

The writing of Master Plan as per the approved Master Layout Plan and CZA guidelines virtually began during March 2013. It was a bigger challenge before me to write a very comprehensive and integrated Management plan based on the ground realities. The technical committee members of the CZA were of the opinion that I should continue and complete the plan as it was half way through despite of my transfer. The Zoo Authority of Karnataka also were of the opinion that I complete the assignment as per the opinion of CZA. My professional commitment and the special attachment to the management of wildlife provoked me to accept the responsibility and thus I have completed this maiden planned document in a span of 1 year. The ZAK was magnanimous to extend the facilities to sit and write the plan in the camp office located within the limits of BBP and also the staff support.

The Knowledge and experience acquired by preparing such wildlife management plan earlier for BRT and Bandipur Tiger reserve made this job easier to complete this document in a limited time. This being the first comprehensive Master plan for the Zoo, Safari, Rescue Centre and Butterfly Park, the Past history and the present status of management has been consciously reflected in the plan for posterity. The constraints, deficiencies, failures and successes are brought out in the plan without hesitation in the larger interest of upgrading the management efficiency in the organization. The uniqueness of the master layout plan is thematic display clubbed with bio-geographical distribution of animals.

The attempt to establish high-tech Zoo hospital is to provide the improved health management system. The regular health protocol like prophylactic treatment,

vaccination schedule and planned and organized way of epidemic management in the park are the mandatory stipulation of this plan. Breeding of identified endangered species and various aspects of research are the new additions in this plan. The enclosure enrichment by providing optimum space and facilities to ensure the biological comforts of captive animals are given thrust in the management.

The education and Nature Interpretation initiatives to spread the message of conservation in a comprehensive manner to the interest of public have been identified as the priority in this plan. The world Zoo Conservation Strategy notes that, Zoos and parks reach hundreds of millions of people all over the world, if the Zoo education is made compatible with Zoo recreation. Therefore the emphasis on nature awareness through people participation has been identified as the priority in the plan. The plan for establishment of Zoo youth club and strategies to organize outreach programmes, workshops, Voluntary activities and interpretive programmes on signage film shows, class room lectures for the visiting tourist are the highlights of the plan under Zoo education.

According to Dr. H. Hedigar (1969), there are 3 basic aspects in Zoo biology namely, living space, diet and animal human relationship. As the living space available in the enclosures of existing Zoo is being confronted with CZA stipulations, the up gradation of the congested enclosures and building of new enclosures has been the priority in the plan. The plan for authorized procurement of food, storage, preparation and distribution based on scientifically worked out diets to each animal ensure the right quality and quantity of food to all the captive animals housed in the park. Animal to animal relationship and the relationship with their keepers guarantees the psychological order in their captive life. The relationship is mostly a function of daily care and maintenance. In order to ensure this it is planned in the document to provide various training program to keepers. It is also planned to establish linkage between the institution and corporate sector including NGO's for a participatory management as programs like animal adoption, CSR contribution and such other institutional supports are envisaged in the plan.

I have taken all the care to incorporate every aspects of management as stipulated in the guidelines issued by the Central Zoo Authority in this vision document. Further, there will be adequate scope for the improvement of this document during the plan period by incorporating new advancements in the field as the Zoo Science is dynamic and can keep grow day by day. I also welcome any critics or analysis by the experts in the field for improving this plan. I strongly believe in the

ethical values of wildlife management as I have served more than 20 years in the field of wildlife management in Karnataka State. I was fortunate to be blessed with many opportunities to serve the most prestigious wildlife reserves of the state such as Bhadra Tiger Reserve, Mysore Zoo, Nagarhole Tiger Reserve, BRT Tiger Reserve, Bandipur Tiger Reserve and Bannerghatta Biological Park. Serving to the sacred wildlife is a rare chance and only few fortunate officials will have such a blessed opportunity. I wish all the success in the endeavor of implementing this plan for the benefit of captive animals and general public which ultimately leads to the cause of conservation to save mother earth.



(Dr. R. Raju, IFS)
Executive Director
(2011-12 to 2012-13)

ACKNOWLEDGEMENT

I, owe my deep sense of gratitude to Shri. Kaushik Mukerjee, IAS., the then Additional Chief Secretary, Forest, Ecology and Environment and presently the Chief Secretary to Government of Karnataka for the invaluable support and precious guidance given to me while preparing this plan and administering the Bannerghatta Biological Park as Executive Director.

I, sincerely express my profound gratitude to Shri. R.S. Suresh, IFS., Additional Principal Chief Conservator of Forest and the Member Secretary, Zoo Authority of Karnataka for the timely guidance and priceless support for preparing this plan.

I also express my sincere gratitude to Shri. M. Nanjundaswamy, former Chairman, Zoo Authority of Karnataka for the timely support and advice while preparing this plan.

I, express my sincere thanks to Shri. Deepak Sharmah, IFS., former Principal Chief Conservator of Forest and Chief Wildlife Warden of Karnataka and also Shri. Vinay Lutra, IFS., Principal Chief Conservator of Forest and Chief Wildlife Warden of Karnataka for their valuable suggestions and advices.


I also express my profound gratitude to Shri S.C. Sharma, IFS (Rtd.) who is the authority on the management of zoos in the country and Shri S.K Patnaik, IFS (Rtd.) and Sri B.S. Bonal, IFS, Member Secretary, Central Zoo Authority for their timely guidance and suggestions to prepare this plan document.

I am grateful to the officers of Bannerghatta Biological Park Shri N. Devaraj, IFS and Shri Range Gowda, IFS, the Executive Director of the park for their support and also Shri. Mohamad Ali, Deputy Director, Shri. Muddanna, Range Forest Officer, Zoo Range, Shri. Shankara Gowda and Shri Nagaraj, Range Forest Officers, Safari Range, and Shri. K. Nagaraju, Range Forest Officer, Butterfly Park for giving me the timely assistance while preparing the plan.

I also express my heartfelt sense of gratitude to Shri C.M. Chandrashekhar, Assistant Engineer, BBP for his deep involvement in preparation of different layers of layout maps by duly conducting survey of all the units of BBP and also for his close assistance in preparation of this plan document. Further my sincere thanks to Dr. C.V. Ramachandra, Deputy Director (V.S), Dr. B.C. Chittiappa, Assistant Director (V.S) and Dr. Hemalatha and Dr. Shilpa, Pathologists, Dr. Sujay. C.S, Veterinary Officer for extending the support.

I also express my sincere thanks to Shri Suresh Devadiga, Computer Assistant, for fully involving in the typing of this document and also BBP office staff for their assistance. My sincere thanks is also due to Shri. M.S. Raju of M/s Thematics Infotech Pvt. Ltd, Bangalore for surveying the area and production of layout maps in an excellent manner in a required time.

I finally express my sincere thanks to all the staff and my pets Puttu and Gundu for their association with me at Suvarnamukhi Camp Office during my stay to prepare this plan and all other kith and kin who directly and indirectly involved in preparation of this document.



(Dr. R. Raju, IFS)
Executive Director
(2011-12 to 2012-13)

EXECUTIVE SUMMARY



The Bannerghatta Biological Park, popularly known as BBP, has been an integral part of **Bannerghatta National Park** and emerged out as an independent establishment during the year **2002**. It is in order to meet the growing demand for eco-recreation, eco-tourism and conservation, an area of **545.00 Ha** of forest from National park was set aside to constitute as **Biological Park** originally and later extended to the present status of **731.88 Ha** in area.

The demand for providing recreational and wildlife tourism facilities to the visiting tourists has given the idea of creating a **mini zoo** and a **nature park** by carving a small portion of area in the **tourism zone** of **National Park**. Gradually, the additional facilities have been created as per the need of growing demand. The **lion safari** was established during **1979** for the first time, followed by the establishment of **tiger safari** during **1987**.

The establishment of a dedicated wildlife rescue and rehabilitation centre during the year 2000 with the assistance of CZA, GOI, New Delhi has become an added activity to guarantee the welfare and comfortable life to the rescued animals.

The result of sustained effort in developing the Bannerghatta Biological Park in a multi dimensional manner motivated the authorities to establish another scientific and unique ecotourism institution, **Butterfly Park** in the limits of BBP. The collaborative venture by the department of Bi-technology GOI, and the University of Agricultural Science Bangalore under the supervision and management by ZAK the butterfly park was established and put to public display during the year **2007**. Thus, the Bannerghatta Biological Park has become a unique ecological and ecotourism centre in the nation.

The Chief Conservator of Forest, namely Shri Y.M.L Sharma, IFS in the Karnataka Forest Department was responsible to establish a “**picnic corner**” during the year 1971. His Excellency the governor of Karnataka, **Shri Dharmaveera**, declared an area of 104.27 sqkm of forest as the Bannerghatta National Park during the year 1974 and the Bannerghatta Biological Park was an integral part. The Bannerghatta biological Park popularly known as BBP is 42 year old and serving as one of the important conservation area of the nation. After the creation of Zoo Authority of Karnataka the Bannerghatta Biological Park was transferred from State Forest Department to ZAK. Since from the inception sustained efforts to modernize

the park and upgrade the facilities for the health care and general welfare of animals have continued at substantial investments. These developments have attracted the large number of tourists and gained the unique distinction of being the first Zoo in the nation as far as financial earning is concerned. The revenue earning of rupees 17.72 crores by the institution during 2012 - 2013 has been the all time record of the institution and highest in the nation.

Establishment of the “**World Zoo Conservation Strategy 1993**” and the **Central Zoo Authority of India** given new avenue in the field of Zoo Management in the country. The Strategic location of BBP in the limits of Global Fame, Bengaluru has guaranteed the financial strength and rapidly growing technology to manage this park in a more natural way. The periodical publications of relevant scientific information from various scientific institutions, universities and the CZA facilitated the spark to grow in a multi-dimensional manner to reach the present day status.

The Master layout plan approved by the CZA has given a tremendous scope for the overall development of the Zoo. The small area of 12.54 Ha of the existing Zoo has been proposed to expand over an additional area of 28.54 Ha and thereby the total area of Bannerghatta Zoo will be 41.08 Ha. The periphery of the Zoo has been demarcated and barricaded with stone wall compound to ensure safety and security to the inmate captive animals. The CZA have also approved the animal collection plan for Bannerghatta Zoo which provides good scope to add up substantial number of new species which would remain as star attraction to the Zoo in future. Presently the Zoo is proud of housing the endangered species like tiger, Grey Indian Wolf, Indian Gaur, Wild dog, Brow Antlered Deer, Sloth bear, Red jungle fowl and Peafowl. The commitment and dedication of the staff and senior lever executives has been the instrument of success to bring this institution to national fame.

The continued inspiration in the management and the assured financial strength along with the availability of optimum space has given the way for modernizing the old Zoo and adding up new Zoo. The existing old, congested and unscientific enclosures are planned for demolish. Some of the qualified enclosures will be retained and will be modified to provide adequate space and facilities. The proposed Zoo will have all new enclosures which will be designed as per the CZA specifications and scientific requirement of space water and other facilities. The water supply and UGD line will be established as per the terrain condition and ground demand to provide adequate water supply and to facilitate for the proper discharge and disposal of liquid and solid wastes. The visitor’s circulation path, road network

including service roads and pedestrian paths will be developed to facilitate for the smooth movement of vehicles and visitors.

The entire Zoo area has been planned to divide into 4 sections for efficient management of each animals and their display to the visiting tourists. The themes for the display of animals is of Zoo-geographical clubbed with Taxonomical basis, however the display based on ecosystem concept is also considered and their exhibits. In addition to the facilities explained above the lawns, strip gardens, parks and other green areas will be developed not only to make the park aesthetically good but to keep a minimum of 30% total area under green cover as per the CZA mandates. The existing clinical facilities will be upgraded by developing a high tech hospital with world class facilities. The food supply and distribution to the animals will be systematized by providing additional storage and kitchen facilities. The visitor's facilities such as shelters drinking water, rest lawns, food courts and children play area will be developed in a more appropriate manner. The Facilities for Zoo Interpretation and Education will be developed keeping in view of the youths and educated visitors to the park. The research and conservation breeding will be the rust area in the management plan.

Master plan also proposes to add varieties of exotic species to attract large crowd round the year. The new additions such as Giraffe, Zebra, puma, Hunting Cheetah, Chimpanzee, Jaguar and varieties of monkeys have been planned to procure to enrich the exotic animal collection. In addition, efforts will be made to enrich the animal stock by concentrating on indigenous animals which are endangered and facing treat in the nature. The Bannerghatta Biological Park has unique distinction of being the first in the nation having various safaris for the public display. There are different units of safaris for lions, tigers, sloth bears and herbivores. These units being the lifeline of BBP attracts large crowd from all over and assures the sustained generation of revenue round the year. The revenue of the park has been consistently more or at par with the expenditure for the last few years. Such a situation gives the organization with lot of autonomy in further developments. The master plan provides for the establishment of new safari for leopards. This is the unique initiative as no other place in the nation has the leopard safari at its credit.

The stipulation of CZA to provide a minimum of 20 Ha of area for the safari, the present plan provides the mandates on the management to re-appropriate all the existing safaris by providing a minimum of 20 Ha area to each, therefore the existing lion and tiger safaris will be amalgamated in to one and a new lion safari will be

established in an area of around 20 Ha adjoining to existing bear and tiger safari. The present plan provides the scope for development of water resource, road and animal houses for facilitating the visiting tourists and inmate animals. The herbivore safari will be bifurcated into two units and used on a rotational basis by giving rest to each compartment in the alternate year. Such an arrangement in the management will be helpful to the forest to rejuvenate and the safari visitors will also get the bright chance of seeing more animals.

The rescue and rehabilitation activity in the park is planned in a more efficient and dedicated manner to provide timely assistance to the needy animals. The present plan will provide scope for guaranteeing optimum space, quality food and clinical care to the animals. The rescue and rehabilitation centre will have a dedicated veterinary service and the existing clinical facilities will be upgraded. The required care for rescued, injured and orphaned animals will be given round the clock through dedicated staff.

The existing Butterfly Park will be upgraded by providing additional infrastructure and the present plan will provide the scope for establishment of insectariums and host plant garden. The master plan also proposes to upgrade the health care facilities by way of the provision of separate quarantine facilities, purchase of hi-tech veterinary equipments and also acquisition of ambulance. The wildlife biologist and veterinarians would be required to collect various data for helping the clinical and conservation management.

The civil amenities like drinking water, visitors shelter, toilets and animals viewpoints would be suitably upgraded and also will be built at appropriate places as approved in the master layout plan. The other facilities such as library, auditorium, interpretation centre and museum will be improved and upgraded to the world class to encourage all visitors to upgrade their knowledge in the field of forest, wildlife and environment.



(Range Gowda, IFS)

Executive Director

Bannerghatta Biological Park
Bannerghatta, Bangalore

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ABBREVIATIONS

- ACF : Assistant Conservator of Forests
- ADVS : Assistant Director of Veterinary Service
- APCCF : Additional Principal Chief Conservator of Forests
- ARKS : Animal Record Keeping System
- BBP : Bannerghatta Biological Park
- BBMP : Bruhat Bengaluru Mahanagara Palike
- BBRC : Bannerghatta Bear Rescue Center
- BESCOM : Bangalore Electricity Supply Company
- BFF : Born Free Foundation
- BMTC : Bangalore Metropolitan Transport Corporation Ltd.
- BNP : Bannerghatta National Park
- BRC : Bangalore Rescue Centre
- BT : Bio-Technology
- C & R Rule : Cadre & Recruitment Rule
- CCF : Chief Conservator of Forests
- CEE : Centre for Environmental Education
- CEWF : Contract Employees Welfare Fund
- CD : Compact Disk
- CF : Conservator of Forests
- CWW : Chief Wildlife Warden
- CUPA : Compassion Unlimited Plus Action
- CZA : Central Zoo Authority of India
- DCF : Deputy Conservator of Forests
- DoBT : Department of Bio-Technology
- ECG : Electronic Cardio Graph
- ED : Executive Director
- FCA : Forest Conservation Act, 1980
- GCB : Governing Council Body
- GoI : Government of India
- GoK : Government of Karnataka
- ha : Hectare
- IFAW : International Foundation for Animal Welfare
- IFCI : Industrial Finance Corporation of India
- IFS : Indian Forest Service
- ISIS : International Species Information System

- IT : Information Technology
- IAH&VB : Institute of Animal Health and Veterinary Biologicals
- IVRI : Indian Veterinary Research Institute
- IUCN : International Union for Conservation of Nature
- KJLR : Karnataka Jungle Lodges & Resorts Ltd
- KFA : Karnataka Forest Act, 1963
- KFD : Karnataka Forest Department
- KSTDC : Karnataka State Tourism Development Corporation
- LAN : Local Area Network
- LBH : Length, Breadth and Height
- Med-ARKS : Medical Animal Record Keeping System
- MoEF : Ministry of Environment and Forests
- MoU : Memorandum of Understanding
- MR : Monthly Rated
- MRE : Monthly Rated Employee
- MS : Member Secretary
- MSL : Mean Sea Level
- OH : Over Head
- OT : Operation Theatre
- PCCF : Principal Chief Conservator of Forests
- PWD : Public Works Department
- RF : Reserve Forest
- RFO : Range Forest Officer
- SOS : Save Our Soul
- SPARKS : Species Particular Animal Record Keeping System
- SPV : Special Purpose Vehicle
- UK : United Kingdom
- USA : United States of America
- VIP : Very Important Person
- VVIP : Very Very Important Person
- WADDL : Wild Animal Disease Diagnostic Laboratory
- WPA : Wildlife (Protection) Act, 1972
- WRRC : Wildlife Rescue and Rehabilitation Centre
- ZAK : Zoo Authority of Karnataka
- ZIMS : Zoological Information Management System

PART I

CHAPTER-I

1. INTRODUCTION

1.1 History of zoo's

IUCN (International Union for Conservation of Nature) affirms that a goal of conservation is the maintenance of existing genetic diversity and viable populations of all taxa in the wild in order to maintain biological interactions, ecological processes and function. Conservation managers and decision makers have to adopt a realistic and integrated approach to ex-situ and in-situ conservation implementation. Thus, an ex-situ conservation programme as a part of a formalized conservation and recovery plan with a prescription for meaningful management in the ex-situ areas such as conservation parks, biological parks, zoological gardens etc. Although, the concept of establishment of zoos date backs to 19th century with an intention of providing recreation means to the visiting tourists. The priority of conservation has over taken the recreation over the period of time.

The Wildlife (Protection) Act, 1972 defines, the ZOO is an establishment, maintains a collection of animals for public display and offer for ex-situ conservation. This is also a place for eco-tourism, research and extension to create public awareness in conservation breeding and recreation by involving the endangered species of wild animals which are also in the brink of extinction. The zoos were started as private collections of wealthy patrons, mostly the provincial kings in India, Emperors in Europe and Egypt. Animals were collected and categorized, marveled at for the uniqueness of never being seen before. This kind of private menageries remained for long time as pride of royal collections of the provincial rulers.

The first zoo in the form of manegery was at **Barakpore** near Kolkata in West Bengal during **1802** by **Lord Wellesley**, the then the Governor General of India. These type of small zoos have emerged out during 19th century were mostly patronized by the royal families in there provincial kingdom for their private and royal recreation and personal enjoyment.

The origin of modern zoo began during early 19th century with the establishment of **London zoo** in U.K during **1828** and then followed the same in the entire Europe and North America. The first modern zoo to be established in India was at Madras (Chennai) in **1855** which was shifted to sprawling forest area near Arinagar in 1977 and named as Arinagar Anna Zoological Park. Many major zoos were started in the second half of the 19th century in big cities like Trivandrum (1857), Bombay (1863), Alipore (1875), Jaipur (1876), Udaipur (1878), Mysore (1892). This situation was further continued even after the independence in India and resulting in establishment of other zoos at Ahmadabad (1951), Delhi (1955), Darjeeling (1958), Hyderabad (1959), Gouhati (1960). Although the above mentioned zoos were mostly the menageries the concept of housing the animals in the cages, small pits, Small enclosures with basic minimum facilities for food, water and safe living was thought off.

The open zoo movement was popularized by **Carl Hagenbeck** in the early 20th century. In Hagenbeck's zoo at Stellingen, he replaced the incarcerating metal box of enclosures with hidden barriers such as moats and electric fences. Such exhibits allowed combined species to live together in harmony as they do in open nature. The purpose of the zoo also changed from recreation to conservation with an introduction of open moat enclosures. While these concerns have prompted more and more open and natural exhibits, including drive-through safari parks, zoos must realize that their aim should not be to become a nature reserve. The true role of modern zoo is to perform as repository of knowledge for the youths and all other common people in the society. Therefore zoo must inhabit a cultural space in a city in order to reach the common person who would not normally watch animal documentaries. The animals housed in such zoos and parks should serve as ambassadors, conveying ethos of conservation to all people.

The popularity of zoos and parks gives a potential scope for the effective eco-education. All visiting children's to the zoos and parks are normally receptive to the displayed animals and will have unusual stimulus to the overall learning about nature and wild animals. New techniques in veterinary care, new understanding of animal behaviour and ecology and a new technology of zoological park exhibition have coincided with an emerging generation of visitors who seem to have a more sophisticated and compelling interest in wildlife and all other creatures of nature.

The major changes in exhibition technique of animals in zoos, came in the later part of 20th century in the form of creating moated enclosures which was popularized in the entire Europe. The system of wet moat and dry moat was thought off, depending upon the availability of water in the vicinity for the management. In the moat system management the importance was to provide large areas for the free and independent movement of captive animals. Subsequently this kind of management further lead to an improved management system called “**drive in parks**” are “**safari parks**”. The recent change in exhibiting technique with the advancement of science and technology is the “**drive through park**” where vehicles have access to various animal enclosures. The animal enclosures are designed to meet biological requirements of the captive animals to exhibit them in their natural surroundings, so as to facilitate them for captive breeding. The artificially simulated environmental conditions are created as to suite them to their natural habitat.

1.1.1 Bannerghatta Biological Park (BBP)

The Bannerghatta Biological Park, popularly known as BBP, has been an integral part of **Bannerghatta National Park** and emerged out as an independent establishment during the year **2002**. It is one of the renowned wildlife tourism centres at present in the state of Karnataka. It is in order to meet the growing demand for eco-recreation, eco-tourism and conservation, an area of **545.00 Ha** of forest from National park was set aside to constitute as **Biological Park** originally and later extended to **731.88 Ha**. The Bannerghatta National Park was notified during 1974 for conserving the fauna and flora of the area apart from providing limited wildlife tourism and recreation facilities to the visiting tourists coming all over the world to fast growing city Bengaluru. The objective was to create facilities to the nature lovers to visit the park and study the botanical and zoological components of the nature in the park. Further, also to promote better scientific knowledge on the forest and wildlife in the minds of younger generation.

A legendary and renowned forester by name **Sri Y.M.L Sharma, IFS** the then Chief Conservator of Forests and head of Karnataka Forest Department was solely responsible for the creation of **Bannerghatta National Park (BNP)**. His Excellency the Governor of Karnataka, **Sri Dharma Veera**, during the President rule in Karnataka promulgated through a notification by declaring **104.27 sq km** of forest as the **National Park** in the year **1974**. The demand for providing recreational

and wildlife tourists facilities to the visiting tourists has given the idea of creating a **mini zoo** and a **nature park** facilities by carving a small portion of area in the **tourism zone** of **National Park**. Gradually, the additional facilities have been created as per the need of growing demand. The **lion safari** was established during **1979** for the first time, followed by establishment of **tiger safari** during **1987**. By virtue of its fascinating attraction, the tourist visitation started improving day by day in a more encouraging manner resulting to the creation of various other conservation and recreation facilities. Presently the important component areas of Bannerghatta Biological Park are,

- 1. Bannerghatta Zoo**
- 2. Bannerghatta Safari**
- 3. Bannerghatta Butterfly Park**
- 4. Bannerghatta rescue and Rehabilitation centre**

The establishment of a dedicated wildlife rescue and rehabilitation centre during the year 2000 at Bannerghatta with the assistance of CZA, GOI, New Delhi has become an added activity to guarantee the safe and comfortable life to the rescued animals. This situation has stimulated and inspired even the outside entrepreneurs and as a result the rescue center has become the safe home for the tigers rescued from Europeans circuses. Thus, The BBP has built a well established facility for the rescued European tigers within the Biological park area with some financial support from an abroad NGO namely, Born Free Foundation (BFF) from London. Further it was during 2002, the BBP authorities have created rescue centre facilities by dedicating portion of area within the Bear safari for the rescued Sloth Bears involved in street performance for their livelihood.

The Government of Karnataka after realizing the resources, expertise and Professionalism available in the field of captive management has decided to establish a dedicated organization namely **Zoo Authority of Karantaka (ZAK)** with effect from 01.04.2002 at the state level. The Bannerghatta zoo, various safari units and rescue centre created within the area of Bannerghatta Biological Park measures around **731.88 Ha** constitutes as an integral part of Bannerghatta National Park. The management jurisdictions of Bannerghatta Biological Park was brought under ZAK with effect from 01.04.2002.

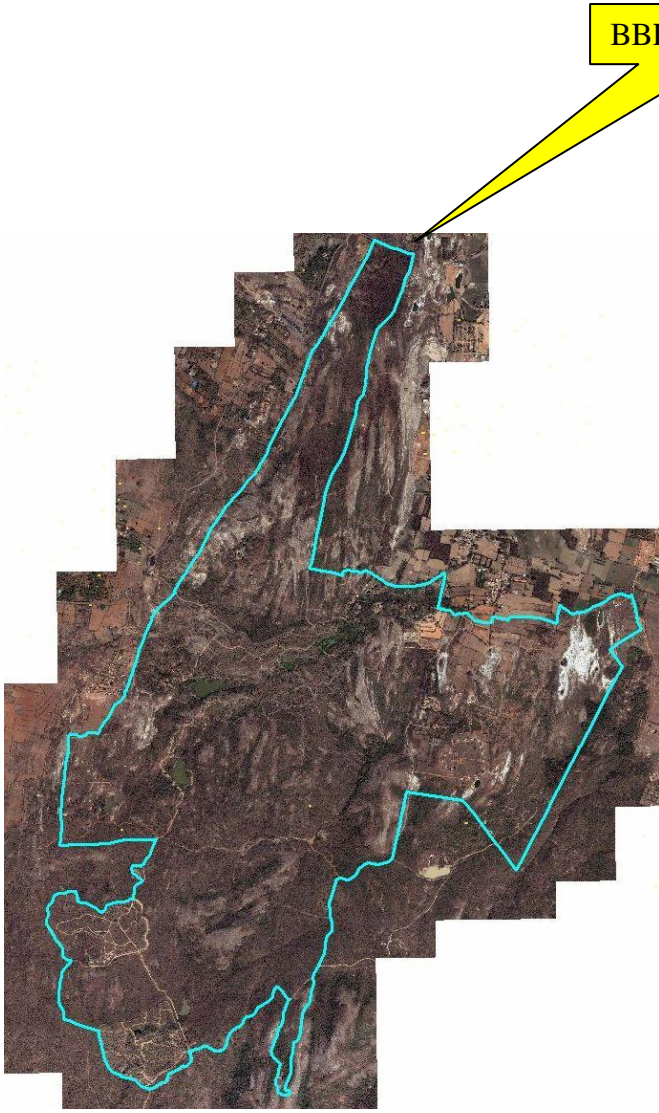
The result of sustained effort in developing the Bannerghatta Biological Park in a multi dimensional manner provoked the authorities to established an another

scientific and unique ecotourism establishment **Butterfly Park** in the limits of BBP. The collaborative venture by the department of Bi-technology GOI, and the University of Agricultural Science Bangalore under the supervision and management by ZAK the butterfly park was established and put to public display during the year **2007**.

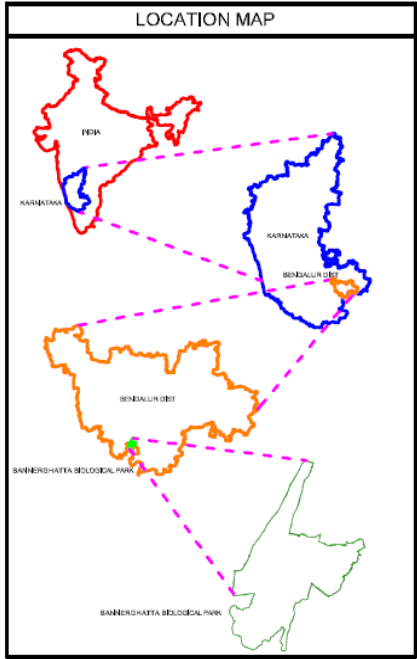


Orphaned elephant named as “Ashwathama” by His Excellency Governor of Karnataka H.R. Bharadwaj

BANNERGHATTA BIOLOGICAL PARK



BBP Boundary



Location index map of BBP

Satellite Map of BBP

1.2 Vision

- i. To maintain, present bio-diversity levels through all viable and effective means including, appropriate ex-situ conservation and perpetuation.
- ii. We envision the planet earth wherein human values for protection and preservation of the fauna and flora of the world.

1.3 Mission

We shall strive to provide natural habitats for the animals housed by providing and manipulating suitable environment and spread the message of nature conservation by awareness and educational programmes.

1.4 Strategy

- i. Prepare a long term master plan for development to ensure optimum utilization of the land, water, energy and finance.
- ii. To maintain a healthy, hygienic and natural environment in the zoo so that the visitors get adequate opportunity to experience a natural environment.
- iii. Ensure the priority to the species which are in the brink of extinction and survival threat through an appropriate breeding plans by giving preference such as locality, region, country and other areas.
- iv. We ensure regulate the number of animals of various species in their collection in such a way that each animals serves the means of objectives.
- v. We commit to avoid keeping single animal of non-viable sex ratios of any species.
- vi. We ensure to avoid keeping surplus animals of prolifically breeding species and if required will adopt population control measures.

1.5 OBJECTIVES OF THE BIOLOGICAL PARK

- i. The main objective of the Bannerghatta Biological Park i.e., Bannerghatta Zoo, Bannerghatta Safari and Bannerghatta Butterfly Park shall be to compliment and strengthen the national efforts in ex-situ conservation and strength the conservation of the rich Bio-Diversity of the country, particularly the fauna.
- ii. Supporting the conservation of endangered species by giving species, which have no chance of survival in wild, a last chance of survival through coordinated breeding under ex-situ condition and raise stocks for rehabilitating them in wild as and when it is appropriate and desirable.
- iii. To inspire amongst zoo visitors empathy for wild animals, an understanding and awareness about the need for conservation of natural resources and for maintaining the ecological balance.

- iv. Providing opportunities for scientific studies, Research and documentation on conservation and creation of database for sharing between authorities involved in In-Situ and Ex-Situ conservation.
- v. Bring awareness to the public on conservation and propagation of wildlife by conducting regular awareness and education campaigns and programs.
- vi. Providing dedicated facilities for the rescued and orphaned wild animals by providing appropriate housing, clinical and management facilities in off-the display area.
- vii. To serve as gene pool and germplasm reserve for future biological research on wild animals and to extend facilities for studies on behaviour and breeding of different animals.
- viii. To provide recreational opportunity to the visiting tourists.
- ix. To sustain the founder population and also to augment the depleting populations of endangered species in the wild.



Planting in BBP campus by His Excellency Governor of Karnataka H.R. Bharadwaj

1.6 LOCATION

The Bannerghatta Biological Park lies between **77°33'30.59"-E to 77°34'6.95"-E longitude and 12°46'31.31"-N to 12°48'18.93"-N latitude** and located within the limits of Anekal Revenue Taluk in Bengaluru Urban District. The exact location is on the midway between Bengaluru city and Anekal town at about 25 Km from Vidhan soudha and at about 20 kms to the North West of Anekal town connected with excellent all weather road. It is situated at the distance of 4 Km from the boundary of Bhruhath Bengalure Mahanagara Palike (BBMP) at a place called Gottigere.

1.7 APPROACH

Bengaluru is well connected with road, railway and airline network. There are BMTC bus service as well as private taxis plying from various prominent locations of city to BBP. Some important bus routes with a distance as stated below.

SL	From	Bus No	To BBP (Dist in Km)
1	Bangaluru International Airport		60
2	Vidhan Soudha		25
3	MG Road	<i>BIG-10</i>	23
4	Shivajinagar Bus Stand	368	25
5	Kempegowda Bus Stand & City Railway Station	365	28
6	City Market	366	30

Distance:
Bangalore International Airport - 60 kms
Vidhanasoudha - 26 kms
MG Road - 23 kms
Shivajinagar - 25 kms
Bus Stand
City Railway Station & City Bus Stand - 28kms (Majestic):

Bus Fare (Apx):
City Bus Stand (Majestic):
Rs. 12/- Volvo - Rs. 25/-
Shivajinagar Bus Stand:
Rs.12/- Volvo - Rs.25/-

1.8 TOPOGRAPHY

The area set aside for the Bannerghatta Biological Park campus is at one corner of the Bannerghatta National Park. It is a highly undulating terrain interspersed with barren rocky outcrops and valleys leading to Suvarnamukhi River. There are many small, medium and large water bodies exist within and around the Biological Park. Further some of the natural and seasonal streams flowing down to the valleys within and around the Bannerghatta Biological Park. The altitude varies from 800m at the tiger safari to 980m at the Suvarnamukhi hill above MSL.

1.8.1 Geology, rock & soil

The prevailing rocks are the oldest formation of rocks revealing cryptocrystalline to coarse granites and complex gneiss. The rocks are light to dark grey or whitish Muscovite granite gneiss or Biotitic granite gneiss which varies considerably from place to place in structure, texture and appearance. According to the fineness or coarseness of constituent grains and the relative abundance or scarcity and mode of deposition of the darker Ferro minerals, their complex gneiss masses have been styled “**Peninsular Gneiss**”.

The gneiss exposures in this region are yielding good slab stones and size stones.

The soil on the upper regions is red and gravelly. The soil in the valleys is sandy loam and is formed with finer particles of the decomposed rocks washed down and deposited during rains. The soil is shallow on hill tops and deep in valleys and low lying areas. Two types of soils are found in the BBP

- i) Red soil generally deep or shallow mixed with metamorphic forms of rocks in undulating grounds.
- ii) ii) Sandy loams in valle

1.8.2 Flora

The type of vegetations in BBP can be broadly classified into two types as described below

i) Scrub Type (Dry Deciduous Scrub Forests):

Vegetation in this type of forest is characterized by stunted tree growth open canopy of 10% and below. This type of vegetation is the resultant action of repeated hacking by villagers and grazing by cattle in the past from the adjacent villages.

Important upper canopy trees are *Anogeissos latifolia*, *Chloroxylon sweitenia*, *Acacia leucophloea*, *Acacia catechu*, *Stereospermum chelonoides*, *Zizyphus spp*, *Diospyros spp*, *Santalum album*, *Shorea talura*, *Azadirachta indica*, *Terminalia spp*, *Dendrocalamus strictus etc.*,

Whereas *Lantana camara*, *Phoenix acaulis*, *Cassia tora*, *Cassia auriculata*, *Randia floribunda*, *Pterolobium indicum*, *Capparis spp*, *Gloriosa superba* form the undergrowth. *Acacia instia* is the common climber. Grass is generally abundant in this type of forests. Scrub forests afford good foraging habitat for herbivores in rainy season. This type of vegetative growth is around rocky patches in bear safari and in part of other safaris and rescue center.



ii) Southern Tropical Dry Deciduous Forests:

In this type of forest, the canopy opening is 10 – 40% and the trees remain leafless during dry months. Top canopy consists of *Terminalia spp*, *Pterocarpus*

marsupium, *Dalbergia latifolia*, *Dalbergia paniculata*, *Gmelina arborea*, *Lagestroemia parviflora*, *Boswellia serrata*, *Dendrocalamus strictus*.

Second canopy consists of *Vangueria spinosa*, *Randia dumentorum*, *Wrightia tinctoria*, *Zizyphus jujube*, *Santalum album*, *Kydia calycina*, *Diospyros melanoxylon*, *Shorea talura* and *Casia fistula*.

The undergrowth consists mostly of grasses with lantana breaks here and there. *Eupatorium*, *Phoenix humilis*, *Helicteris isora*, *Desmodium spp.* *Gloriosa superba* form the undergrowth. This type of vegetation is conspicuous in the valley portion all along the streams passing through the BBP.

iii) Southern Tropical Moist Mixed Forests:

This type of forests is the mixed deciduous forests with canopy cover up to 35% and above. They are in patches limited to the moist valleys in Ragihalli RF. The species comprising the top canopy of this type are *Tectona grandis*, *Terminalia spp.*, *Pterocarpus marsupium*, *Dalbergia latifolia*, *Lagestroemia lanceolata*, *Pterocarpus marsupium*, *Bombax malabaricum*, *Adina cordifolia*, *Ficus infectoria* and other species of *Ficus*.

The lower canopy consists of *Emblica officinalis*, *Mallotus philippinensis*, *Kydia calycina*, *Randia dumetorium* etc.

The undergrowth consists of *Solanum ferox*, *Solanum indicum*, *Helicteris isora*, *Hemidesmus indicus*, *Lantana camara*, *Eupatorium* etc. This is the type of vegetation present in the valley –old zoo area (the old lac reserve).

1.8.3 Fauna

Other than captive animals available in the Zoo, Safaris and Rescue Centres of Bannerghatta, following animal are found in wild in the Bannerghatta National Park and they also frequent to the area of Bannerghatta Biological Park and some of them do live there.

- i) **Mammals:** Elephant, Leopard, Bison, Chital, Sambar, Sloth Bear, Barking Deer, Wild Boar, Wild Dog, Jackal, Mouse Deer, Bonnet Macaque, Striped Hyena, Porcupine etc.



- ii) **Birds:** Peafowl, Grey Jungle Fowl, Partridges, Quails, Flycatchers, Wood Peckers, Ibis, Storks, Sunbirds, Flower-Peckers, Thrushes, Eagles, Cuckoos, Parakeets, Orioles, Minivets, Wagtails, Drongos etc., form part of avifauna of the BBP in nature
- iii) **Reptiles:** Land monitor lizard, crocodiles, tortoise, python, rat snake, cobra, krait, viper etc. are the part of animals live in the water holes/ blank area of the BBP.
- iv) **Amphibians:** Frogs, toads, salamander etc., in the water bodies of BBP
- v) **Fishes:** Varieties of fishes are available in rivers, rivulets and so also in the water tanks located within the BBP.
- vi) **Insects:** Varieties of butterflies, bees, ants, etc are seen in the BBP



1.8.4 CLIMATE AND SEASON

The area reveals the three distinct climatic seasons namely summer, monsoon and winter. The climate is generally salubrious and enjoyable round the year.

- 1) Summer Season – The summer starts from Mid February and goes upto the end of May. The mean temperature is around 27degree c. with a maximum temperature touches around 35 degree centigrade in the days of hot summer during last week of March and early may.
- 2) Monsoon Season – It is generally wet a season starts from early June to mid November with breaks in rainfall in the month of July. The area experiences both south-west and north-east monsoons.
- 3) Winter Season – It is generally a cold season starts from November and prevails till mid February.

1.8.5 RAINFALL

i. Rainfall Pattern and distribution

The Park receives rainfall from both South-west and North-east monsoons. Heavy rainfall occurs during the month of September and October from North-east monsoon and torrential rains from June to August from South-west monsoon. Rainfall varies from 625 to 750mm, occasionally the area receives heavy cyclonic rains in October and November

ii. Temperature

The temperature of the zoo is generally salubrious. The mean annual temperature of the park is around 27°C with a maximum 38°C and minimum of 12°C and dropping down to 10°C at hillocks. Generally, the nights are coldy in winter in pockets. The sun is somewhat strong during summer.

iii. Humidity

The relative degree of moisture in the atmosphere and the humidity of the locality generally remains less in winter and summer. It is sultry in the month of April/May before the pre- monsoon showers of south-west monsoon and also in the month of October during the north-east monsoon, occasionally the humidity goes upto 85%.

iv. **Wind speeds**

Storms and Cyclones are very rare and there are no records of damage caused by storms and cyclones, to the forests. The moisture laden south-west monsoon dry winds are moderate in June and July, but the north-east winds after the cessation of monsoons are desiccating during January and February creating the need for adequate fire protection.

v. **Drought and its periodicity**

Drought is not severe. However, the droughts of 1970's and 1980's have left their scar when the water table depleted and caused scarcity for drinking water and fodder for the garden in the park.

1.9 DEMOGRAPHY

Bannerghatta Biological Park is an enclosure inside the Bannerghatta National Park having an area of 731.88 ha. However, the boundary of the park is abutting the human habitations of Bannerghatta village (which is almost a town now), Sampgehalli, Byrappanahalli, Vajrahalli towards North and East and Boothanahalli and Hakkipikki Colony towards West. Kasaraguppe and Bilwaradahalli towards the North-West of the BBP. All these villages are thickly populated and they are fast growing due to their proximity to the modern hub of civilization in Bengaluru city and boundary of which is just 4 km away from this zoo (Gottigere is the Southern boundary of BBMP). The land value of these villages is very high and equal to the land value in the city. As a result, most of the agricultural land is under conversion into residential area and housing activities around the zoo is very high. Added to this demographic pressure a big temple ISCON (Sri Krishna temple) very close on the eastern side of the zoo has spread in an area of 2 acres. This is attracting huge crowd of worshipers from Bengaluru and allover. Due to the effective fencing around this institution (BBP), the incidences of theft, infiltration for illicit removal of fire wood or fodder or cattle grazing within the limit of the park is almost nil, but human disturbance in the form of movement of people, vehicles and cattle and also the public sound system during festivals and religious functions is concentrated around this park except to the southern side. This demographic pressure of the people living around this park is going to cause hindrance for the free movement of the visitors of this park and cause indirect and continuous hindrance of human presence, sound and dust pollution to the peaceful living of the captive animals. The park has to wake up and develop in such way that it has to survive in the midst of the human population

around it except south. A tall compound has to be developed around the zoo to prevent the accessibility to the people.

1.9.1 Demographical pressure

The existence of large number of villages around this park exerts huge pressure directly and indirectly as the large number of people and cattle live in this region and depending on the park for their day to day life. The details of people and cattle live around the BBP are as stated below.

Sl. No.	Name of the village	No. of houses	No. of People	No. of cattle
1	Military camp	Camp area	100	-
2	Bylamarada doddi	10	80	-
3	Shilendra doddi	30	150	100
4	Hakki Pikki Colony	80	300	100
5	Boothanahally	30	250	70
6	Kyasaraguppa Old	30	200	50
7	Kyasaraguppa New	8	60	-
8	Bilvaradally	200	600	100
9	Shanboganahally	150	300	100
10	Kanchakyyana doddi	30	150	50
11	Bytarayan doddi	150	450	100
12	Sibagere	15	150	25
13	Bannerghatta	1500	3000	500
14	Kempanayakanahally	500	1500	100
15	Kariyappanahally	150	400	100
16	Byrappanahally	60	300	50
17	Sampige hally	70	450	25
18	Suvarnamukhi	1	6	Temple visitors around 200 peoples per

It is estimated that an average of 10,000 people and 1500 number of cattle are living in this area and creating tremendous pressure on the animals housed in the park.

1.9.2 Religious places

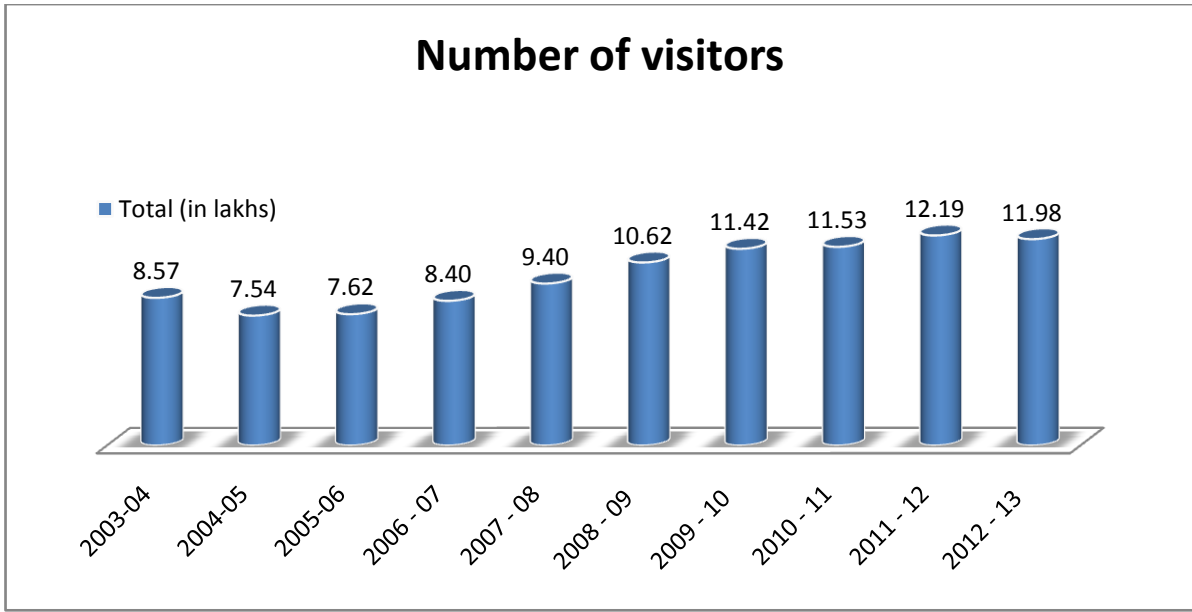
There are large number religious establishments found around the park as detailed below

Sl. No.	Name of the temple	Village	Average No. of devotees
1	Champakadhamaswamy Temple	Bannerghatta	500
2	Narasimhaswamy Temple	Bannerghatta	250
3	Suvarnamukhi Temple complex	Suvarnamukhi Forest area	150
4	Anjaneya Temple	Sampigehalli	100
5	Maheshwaramma Temple	Byrappanahally	50
6	Mariyamma Temple	Bhoothanahalli	50
7	Jain Temple	Kasaraguppe	250
8	Shanimahathma Temple	Bhoothanahalli	50
9	ISKCON Temple	Bannerghatta	500

It is estimated that around 2000 devoties visit the temple on every day.

1.9.3 Visitor's Profile

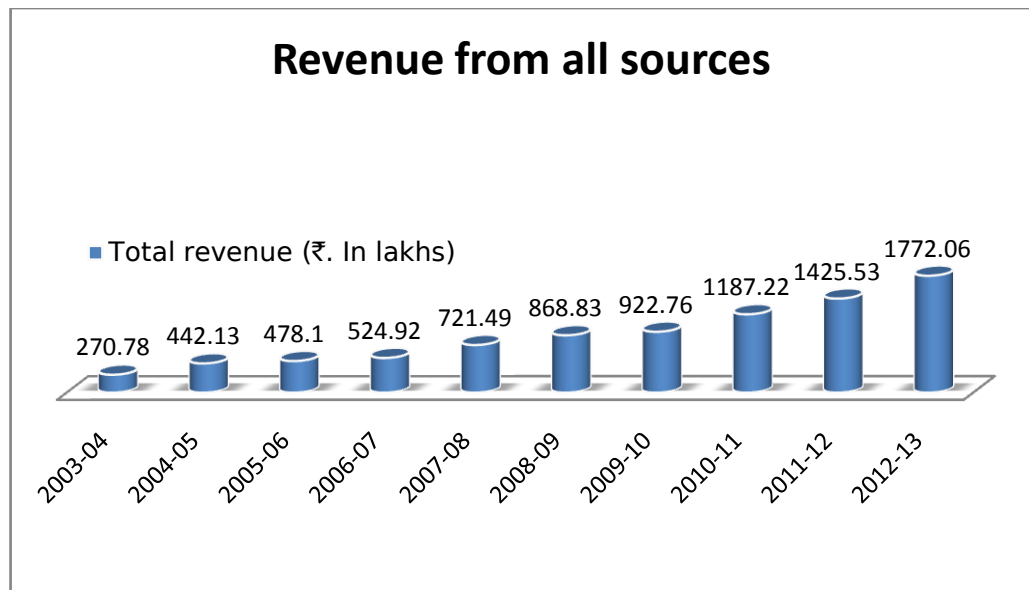
The Bannerghatta Biological Park (BBP) is registering increased annual visitation on each passing year. These figures reveals not only the popularity of the park but demands for the proper upkeep and manage from the point of tourists. The average annual visitation to park for the last five years is more than 1.00 million. If the present situation continued , the visitation would easily touch the mark of 2.00 million in the next 5 years. The number of visitors for the last one decade is as stated below



1.9.4 Revenue

To the maximum extent, it shall be apt to say that BBP is a self financing institution. The main source of income for BBP is from the collection of entry fees to zoo, safaris and Butterfly Park, donation from public/well wishers/philanthropists in the form of adoption of animals, lease rents from outsourced establishments and income from other ancillary activities.

The revenue from all source for the last 10 year are given in the following table:



1.10 LEGAL STATUS

This major zoo was a picnic corner with a mini zoo in the Bannerghatta National Park (BNP) since 1974 and it went on improving into a medium zoo by 2002. With the improvement of this zoo in the BNP, the GoK carved out the Bannerghatta Biological Park (BBP) and handed over to the ZAK for better management and development with effect from 01.04.2002. A notification to this effect was issued vide no.: **FEE 271 APASE 2002 dated 09.09.2003**. The notification states that the area of **731.88 ha** and the buildings existing in it and the vehicles working in the zoo have been excluded from the Bannerghatta National Park and transferred to the Bannerghatta Biological Park.

The details of the areas excluded from the BNP and handed over to the BBP are as follows

Sl No	Area identified	Area in ac., gunt	Area in Ha
A) Existing			
1)	Reserve Forest		
a)	Ragihalli Reserve Forest (Part) Sy. No. 1 of Ragihalli	164.33	66.70
b)	Kalkera Reserve Forest (Part) Sy. No. 2 of Bannerghatta	292.15	118.32
c)	Bannerghatta Reserve Forest. (Part) Sy. No 1 of Bannerghatta Kaval	435.06	176.01
2)	Government wastelands handed over to the Karnataka Forest Department during 1978 in Sy. No. 16 & 21 of Byrappanahalli village and in Sy. No. 130 of Bannerghatta Village	253.19	102.58
3)	Private lands acquired (and some in the process of acquisition) in Bannerghatta & Byrappanahalli villages	168.28	68.27
	Total (A)	1314.21	531.88

1)	That part of land existing in Ragihalli R.F. (Part) and Bannerghatta Lac Reserve (Part) surrounded by asphalted safari road leading from park to safari and existing metal road from Tiger Safari to Bear Safari and further proceeding towards Herbivore Safari (including the road and 30 meters of view lines on outer boundary) as described in enclosed sketch	469.12	190.00
2)	The forest area falling in between Udagabande and Hajamanakallu Road including Udagabande watch tower (as described in enclosed sketched)	24.28	10.00
	Total (B)	494.00	200.00
	Grand Total (A + B)	1829.70	731.88

Then the GoK issued final notification of the Bannerghatta National Park in 2004, as it was pending after the issue of preliminary notification in 1972. As per the Bannerghatta National Park final Notification vide **No FEE 19 FWL 98, Bangalore, Dated 5th March, 2004**, the status of the Bannerghatta Biological Park is an “enclosure inside the Bannerghatta National Park.”. Its status as the enclosure is as follows

*“Bannerghatta Biological Park is a tourism zone covering zoo, safari and the rescue center of the Central Zoo authority built for the rehabilitation of the rescued animals from circuses and street plays. It is brought under the jurisdiction of ‘Zoo Authority of Karnataka’ for the special purpose of conservation and breeding of endangered wild animals, research on wildlife and creation of public awareness etc., This enclosure have the special status as ‘Bannerghatta Biological Park’ comprising of 66.70 + 140.00 + 10.00 = 216.70 ha of Ragihalli Reserve Forest, 118.32 ha of Kalkere Reserve Forest, 176.01 ha of Bannerghatta Reserve Forest, 50.27 ha of Bannerghatta Lake Reserve, 102.58 ha of Government waste land and 68.27 ha of Acquired Land. Total extent of 731.88 ha is exclusively reserved for Bannerghatta Biological Park as per **GO. No: FEE 271 APASE 2002 dated 09.09.2003.**”*

N.B: The boundary descriptions be defined and notified to in due course.

As per the notification of the BNP and the note below the enclosure BBP, the boundary description of the BBP has to be defined and notified in due course. Therefore, it is desirable to describe the boundary of the BBP and notified.

1.11 SOURCES OF POLLUTION

The source of pollutions in this park is from two sources i.e. from the external sources and within the park.

The external sources of pollution are movement of people, vehicles and cattle and their sounds, dust and smoke. The movement of these causes visual disturbance and sound disturbance to the animals' and discomfort to the visitors. The people living very close to the zoo area and the temple that is come up very close to it are the source of the worry to this park especially to the birds. One solution to put break for these pollutions are rising of tree barriers along the boundary like rising of *Polialthia longipolia* trees in two rows along the compound. Even the sewage from the fast developing township in the upstream side of the mini zoo is suspected to spoil the hygiene of the zoo in future.

The internal sources of the pollution from the park are solid waste and liquid waste from the captive animals, visitors and the vegetation in the park.

The solid wastes are the leftover of the animals' food, fecal matter of the captive animals, litter from the visitors and litter and fall of branches from the trees. There is arrangement in the park to collect all the above cited solid waste and dump in the waste bins made for them separately (left over's of the carnivorous animals like bones and flush into the bone pits). The fecal matters of the carnivorous and bears are collected and put in a separate compost pits and covered since it is the source of bad smell and breeding centres of vector. The other wastes are collected and dumped daily in the three big waste bins constructed inside the park, small dust bins are placed at important points to receive the litters from the visitors and later on transported out of the park. Arrangements need to be made for proper segregation of degradable and non degradable waste in preparation of compost manure.

The liquid wastes are the urine of the animals kept in the cages, and the waste water of animal wash and floor clean of the captive animal house etc., are all driven through open drains and pipe arrangements made in the holding houses into the soak pits to maintain the hygiene. The sewage from the toilets of the offices/residences and

public toilets are driven into the soak pit and soak pits are cleaned by deploying mechanical suckers engaged from Bangalore city when found necessary. However, the cleaned sewage from the hippopotamus enclosure, crocodiles, duck pond, porcupine, tortoise and the birds' aviary are left to the natural water course as and when cleaned. This is a one source of pollution affecting the natural water source for which a plan is afoot for safe disposals of these liquid wastes through underground sewage system after treatment.

1.12 EXISTING SITUATION

The Bannerghatta Biological Park of the Zoo Authority of Karnataka is 12 years old (2002) but, the then mini zoo and the safaris started in the BNP have started coming up gradually based on the 1st Management Plan written by the founder of the park Sri Y.M.L Sharma, the then head of the Forest Department in 1971. The stalwarts of the Karnataka Forest Department like Sri M. J. Mascarhenas, IFS, Chief Wildlife Warden in 1970's, has contributed in their own committed way for the development of this park, as it was very close to the capital city Bengaluru, the head quarters of the Chief Wildlife Warden, Karnataka. In the absence of Indian zoo policy till 1991 and the International Modern Zoo policy for ex-situ conservation of wild animals adopted in Earth Summit of Rio de jenero in 1992, this park was subjected for development based on the technologies available at that time with "barless moated enclosures and drive in parks" concepts. As a result, the holding houses of the captive animals, cages of the birds, cages of some animals and also some safaris of drive through park looks out dated when compare to the present concept of creation of the animal enclosures very close to the natural settings of their bio-geographical region with drive through facility by utilizing the modern technology in the field of construction. The problem of disposal of liquid waste is also threatening the hygiene and environment of the park and its animals. The park was developed in a concentrated way as a "**picnic corner**" in the valley in the midst of dense forest growth to meet the demand of the visiting tourists of 1970's and starting of the lion safari in 1979 and tiger safari in 1987 in the midst of the forest at a distance of 4 km from the zoo was a visionary decision, which gave all the scope for this park to develop into a major zoo.

The park went on expanding its activities in the forest areas between the mini zoo and the lion and tiger safaris by establishing Rescue Center in 2000, BFF Tiger

facility in 2002. The old Nature Camp was developed by the Karnataka Jungle Lodges and Resorts into a resort in 2002 by entering into an MoU with the park and the old herbivore safari built in 1970's was opened to the public in 2002. All facilities forced the BBP to open the Grand Safari during 2003 covering zoo, herbivores safari, bear safari, lion safari and tiger safari providing facility to the public to see most of the animals of South India in the natural setting of forests. The opening of Butterfly Park was added attraction since 2007.

The developmental activities in the park was carried out based on the Plan written Sri B.M.T. Rajeev, IFS, Executive Director in 2003 which was said have been prepared by employing experts. The said plan was exposed for debate and agreed by the expert committee even by involving the then Forest Minister Sri K.H. Ranghanath. Subsequently, BBP Master Layout Plan was prepared and got approved by the Central Zoo Authority in the year 2008 and upgraded the park to the present stage as detailed in the chapter II of this part.

Hence, this Master Plan for the development and maintenance of this biological park is in line with the model master layout plan approved and communicated by the CZA by taking into consideration of all technical aspects of a standard zoo.

CHAPTER 2

APPRAISAL OF THE PRESENT ARRANGEMENT AND CONSTRAINTS

2.1 INTRODUCTION

Bannerghatta Biological Park (BBP) is one of the renowned wildlife tourism centre in Karnataka. This was started in a very modest way in the form of “**Picnic corner**” during the year **1971** in order to provide the picnic facilities to the urban population living in the vicinity of Bengaluru. Over the years number of other ecological and tourism important units were setup under the umbrella of Bannerghatta Biological Park such as **Zoo, Safari, Rescue Centres, Butterfly Park and Nature Camp** etc., The basic objective of establishing multi faced ecological institution in Bannerghatta is to mainly provide bio-recreation and education apart from ensuring the conservation of fauna and flora of the region. The Zoo Authority of Karnataka after realizing the multi various activities being carried out of by BBP, have decided to systematize the management and thus have created independent units of management, under the exclusive control of Range Forest Officers for each of the unit.

The entire area of the Biological Park is 731.88 Ha, which is an integral part of Bannerghatta National Park has been systematically classified into 04 constituent areas, bringing under the exclusive control of unit officers for a dedicated scientific management.

1. Bannerghatta Zoo
2. Bannerghatta Safari
3. Bannerghatta Butterfly Park
4. Bannerghatta Rescue Centre

The entire management and administration of Bannerghatta Biological Park is under the control of **Executive Director**, who is of the cadre of Chief Conservator of Forests and assisted by Deputy Director, Assistant Director (Veterinary Service), Range Forest Officers, Zoo Engineer and other supporting staff. The present working strength of Bannerghatta Biological Park consists **208** members, who are

given with definite duties and responsibilities. The numbers in the working strength of BBP may differ from time to time depending on the necessity.

2.2 AREA DETAILS OF BANNERGHATTA BIOLOGICAL PARK

The land area of BBP has been allotted and also designated for various purposes including, housing the animals. The BBP has been in existence from past 40 years and travelled through a steady journey of starting from a small “**Picnic Corner**” to reach the present status of “**Large zoo**”. From the beginning, the development was not preplanned and large number of structures have come since then and most of them are without planning and doesn’t fulfill the standards of CZA. Hence there is an essential need for placing them in proper order and to adhere to the standard prescribed by the CZA.

SI No	Area under different use	Extent
1.	Bannerghatta Zoo	
	1.1 Existing zoo (old zoo)	12.54 ha
	1.2 Proposed expansion of Zoo (new zoo)	28.54 ha
	1.3 Biodiversity Park (proposed)	43.35 ha
	1.4 Suvarnamukhi Religious Garden (proposed)	2.56 ha
	1.5 Medicinal Plant Garden (proposed)	10.25 ha
	1.6 Orchidarium (proposed)	6.20 ha
	1.7 Arboretum (proposed)	6.87 ha
2.	Safari	
	2.1 Bear Safari (includes 08 acres shared to WSOS)	20.00 ha
	2.2 Tiger Safari (Existing)	14.00 ha
	2.2.1 Tiger Safari (proposed)/Lion existing	6.00 ha
	2.3 Lion Safari (proposed)	20.75 ha
	2.4 Herbivore Safari	68.00 ha
	2.4 Leopard Safari (proposed)	20.90 ha
	2.5 Conservation breeding centre (proposed)	26.45 ha

	2.6 Elephant Care Centre	49.50 ha
3.	Butterfly Park	
	3.1 Butterfly Park	4.86 ha
	3.2 Butterfly Host Plant Garden	12.00 ha
4.	Rescue Center	17.50 ha
5.	Life time care rescue centre	10.00 ha
6.	Vehicle Parking Area	2.00 ha
7.	Residential Area	0.13 ha
8.	Area spared for other purpose (using right only)	
	7.1 Wildlife Rescue and Rehabilitation Centre (WRRC)	2.93 ha
	7.2 KSTDC Hotels	0.62 ha
	7.3 Jungle lodges	2.4 ha
	7.4 BMTC Bus stand	0.80 ha
Sub- total area under use		386.75 ha
9.	Balance area which is under forest with number of water bodies, roads etc	345.13 ha
Total		731.88 ha

2.3 BANNERGHATTA ZOO

The Bannerghatta zoo was started as a picnic corner by the department of forest, Government of Karnataka, during the year 1971 in an area of 16.00 Ha. The area of the zoo is a saddle between the **Champakadhama** hill and **Mirza** hill in the **Bannerghatta Sandal Reserve**. The vegetation of the area is encompassed over a very good tree growth of lofty height and large number of bamboo breaks with a natural stream running from north to south (seasonal). The location of the zoo is in between the hills and therefore, it always maintains a cool climate throughout the year with a lush green and salubrious nature.

2.3.1 Layout Plan

The Bannerghatta Zoo was started and developed in a more traditional way without a comprehensive plan and vision. Providing recreational facilities to the visiting public to Bannerghatta was the main object. Therefore the priorities were not there for conservation and propagation. Since there was no plan of development for the conversion of picnic corner into a mini zoo, the extended activities such as collection and display of various local animals did not have any basis of theme. The enclosures were built depending upon the availability of money and species. Thus the entire display was on ad-hoc basis in haphazard manner. Therefore, the old zoo has many pit enclosures for the snakes and small cages for the birds. The water ponds for reptiles and enclosures of monkeys are also not developed with sense of scientific knowledge.

The lawns, gardens and tree growth in the zoo were also not given any importance to restore the aesthetic beauty of the area. Although, enough scope was there to identify the priorities for providing congenial atmosphere to the inmate animals, no scientific planning was done to enrich the environment of animal habitat and the zoo.

The existing road network mostly runs from north to south with few criss- cross roads and have been asphalted to facilitate the smooth movement of visitors within the zoo. Te foot paths linking different enclosures of captive animals are also surfaced with stone slabs in order to ensure the trouble free walk around the area.

At different places to provide shelter for the visitors few temporary tile roofed pergolas and few permanent RCC roofed pergolas have been built with stone bench facilities. It is to provide cleaned, hygienic potable water for visitors, drinking water points have been created at different places mostly around the pergolas and stone benches. The toilet facilities for the visiting tourist have been created within the zoo for the benefit of tourists.

2.3.2 Animal enclosures (Status of present display)

There were around 10 small enclosures built for displaying the birds species within the zoo followed by 8 number of pit enclosure to house the snakes and lizards. The aquatic enclosures for crocodiles and aquatic birds and hippopotamus were also built in the earlier days. In all around 50 number of small enclosures were

established and the various species of birds, reptiles and mammals have been displayed for the benefit of visiting public. The Bannerghatta Zoo which was in this modest status was considered as mini zoo for long time and now recognized by Central Zoo Authority, as one of the large Zoo.

As the animal collection in the zoo has steadily increased over the years due to addition of new enclosures the status of Bannerghatta Zoo has been raised from mini to medium and then to large. Presently the Bannerghatta zoo has been recognized as one large zoo in India as per the CZA recognition given during 2013-14. That's how the picnic corner established during the year 1971 has been developed over the years into a menagerie, mini zoo and now towards as one of the major zoo in the country. At present there are 58 enclosures exists in the zoo area. Although, there is not much space available within the existing zoo area to accommodate all the existing animals on a theme basis, the efforts are being put to display the animals on a recreational value. All the enclosures built so far in the zoo are not in conformity with the space and dimensions stipulated by the CZA. The present collection of zoo is as given below



Statement of animals presently housed in the zoo

Zoo Portion					
Sl.	Name of the animal & Scientific name	M	F	U	T
SCHEDULE I AND II SPECIES (WILDLIFE PROTECTION ACT)					
Birds					
1	Great Indian Horn bill : <i>Buceros vicornis</i>	0	1	0	1
2	Pea fowl Indian : <i>Pavo cristatus</i>	2	5	0	7
3	Spoon bill : <i>Platalea leucorodia</i>	1	0	0	1
4	Kalij Pheasant : <i>Lophurs leucomelana</i>	2	4	0	6
5	Fowl Jungle Grey : <i>Gallus sonnerati</i>	2	0	0	2
6	Red Jungle Fowl : <i>Gallus gallus</i>	7	3	0	10
Sub Total		14	13	0	27
OTHER SCHEDULE & EXOTIC SPECIES (WILDLIFE PROTECTION ACT)					
1	Baya Weaver : <i>Ploceus phillinus</i>	0	0	2	2
2	Budgeriger : <i>Melopsittacus undulates</i>	0	0	3	3
3	Cockatiels : <i>Nymphicus hollandicus</i>	8	7	0	15
4	Heron Night : <i>Nyctcoras nycticoras</i>	20	35	0	55
5	Ibis White : <i>Threskiornis acthiopica</i>	1	5	0	6
6	Love Birds : <i>Agapornis</i>	48	45	0	93
7	Munia Black Headed : <i>Lonchura punctuelata</i>	5	5	0	10
8	Barn Owl : <i>Tyto alba</i>	0	0	1	1
9	Eurasian Egle Owl : <i>Asio otus</i>	2	1	0	3
10	Parakeet alexandrine : <i>Psittacula euparia</i>	1	3	0	4
11	Parakeet rose ring : <i>Psittacula krameri</i>	17	4	0	21
12	Pelican Grey : <i>Pelecanus philippensis</i>	17	14	0	31
13	Red crested pochard : <i>Netta rufina</i>	2	2	0	4
14	Stork painted : <i>Mycteria leucocephala</i>	0	1	0	1
15	Golden Pheasant : <i>Chrysolophus pictus</i>	1	0	0	1
16	Emu : <i>Dromaius novaehollandiae</i>	3	4	0	7
17	Pea fowl white : <i>Pavo cristatus</i>	2	2	0	4
18	Lady Amherst's Pheasant : <i>Chrysolophus amherstiae</i>	2	2	0	4
19	Ostrich : <i>Chrysolophus amherstiae</i>	1	2	0	3

20	Chines ring necked Pheasant: <i>Phasianus colchicus torgatus china</i>	1	1	0	2
21	Black swan: <i>Cygnu atratus</i>	1	0	0	1
22	Silver Pheasant: <i>Lophra nycthemera nyctenera</i>	5	5	0	10
23	Green Winged Macaws: <i>P.Chloropterus</i>	2	2	0	4
24	Rhea: <i>Americana</i>	2	2	0	4
25	Amazon Parakeet : <i>Amazona amazona</i>	1	1	0	2
26	African grey parrot: <i>Psittacus erithacus</i>	1	1	0	2
27	Sun Conure Parrot: <i>Aratinga Solstitialis</i>	3	1	2	6
28	Black Crowned Crane: <i>Balearica pavonina</i>	1	1	0	2
29	Blue Gold Macaws: <i>Ara ararauna</i>	1	1	0	2
30	Palm Cockatoo: <i>Probosciger aterrimus</i>	1	1	0	2
31	Electus Parrot: <i>Electus roratus</i>	1	1	0	2
32	Sulphur Crested Cockatoo: <i>Cacatua galeria</i>	1	1	0	2
33	Scarlet Macaw: <i>Ara macao</i>	1	1	0	2
34	Galah Parrot: <i>Eolophus roseicapilla</i>	1	1	0	2
35	Mottled wood owl: <i>Strix ocellata</i>	0	0	2	2
36	Rainbow Lorikeet: <i>Trichoglussus hacatodus</i>	0	0	2	2
37	Red Lorikeet: <i>Trichoglussus rubritorquis</i>	0	0	6	6
Sub total		153	152	18	323
Total		167	165	18	350
Mammals					
<i>SCHEDULE I AND II SPECIES (WILDLIFE PROTECTION ACT)</i>					
1	Black Buck : <i>Antilope cervicapra</i>	4	11	0	15
2	Leopard : <i>Panther pardus</i>	12	12	0	24
3	Lion Tailed Macaque: <i>Macaca silenus</i>	1	1	0	2
4	Himalayan Black Bear : <i>Selenarctels thibetanuts</i>	4	2	0	6
5	Jackal : <i>Canis aureus</i>	2	3	3	8
6	Macaque Rhesus : <i>Macaca mulatta</i>	3	7	0	10
7	Common Langour or Hanuman Langour: <i>Presbytis entellus</i>	1	3	0	4
8	Indian Giant Squirrel - <i>Ratufa indica</i>	1	2	0	3
9	Shanghai/Thamin Deer: <i>Cervus Eldi</i>	3	6	0	9
10	Mouse Deer: <i>Tragulus meminna</i>	0	1	0	1

11	Wild Dogs: <i>Cuon alpinus</i>	2	0	0	2
12	Indian Grey Wolf: <i>Canis lupus pallipes</i>	3	0	0	3
Sub Total		36	48	3	87
OTHER SCHEDULE & EXOTIC SPECIES (WILDLIFE PROTECTION ACT)					
1	Hippopotamus : <i>Hippopotamus amphibius</i>	2	5	0	7
2	Porcupine : <i>Hystrix indica</i>	3	2	5	10
3	Cat Toddy : <i>Paradoxurus hermaphrodites</i>	1	1	2	4
4	Chital or Spotted deer : <i>Axis axis</i>	4	12	0	16
5	Marmosets: <i>Callithris goeldii</i>	1	0	0	1
6	Hog Deer: <i>Axis Porcinus</i>	5	8	0	13
Sub Total		16	28	7	51
Total		52	76	10	138
REPTILES					
SCHEDULE I AND II SPECIES (WILDLIFE PROTECTION ACT)					
1	Crocodile long snouted Gharial: <i>Gravialis gangeticus</i>	0	4	0	4
2	Crocodile Marsh : <i>Crocodylus palustris</i>	2	2	0	4
3	Indian - Rock Python : <i>Python molurus</i>	2	2	0	4
4	Cobra Indian : <i>Naja naja</i>	10	10	0	20
5	King Cobra: <i>Ophiophagus Hannah</i>	1	1	0	2
6	Viper Russells : <i>Vipera russelli</i>	4	2	2	8
7	Common Indian Monintor Lizard: <i>Varanus bengalensis</i>	0	0	1	1
8	Rat Snake: <i>Ptyas Mucousus</i>	0	0	30	30
Sub Total		19	21	33	73
OTHER SCHEDULE & EXOTIC SPECIES (WILDLIFE PROTECTION ACT)					
1	Snake Sand Boa : <i>Eryx conicus</i>	1	1	0	2
2	Tortise Indian Star : <i>Geochelone elegans</i>	4	5	0	9
3	Crocodile Caiman : <i>Crocodylus crocodylus</i>	15	11	0	26
4	Red - eared slider turtle: <i>Trachemys scripta elegans</i>	0	0	78	78
5	Batagar Terrapin or River Terrapin: <i>Batagar baska</i>	12	8	0	20
6	Indian Mud or Flapshell Turtle: <i>Lissemys punctata</i>	3	2	0	5

7	Morelet's Crocodile: <i>Crocodylus moreletii</i>	1	1	0	2
8	Iguana Green: <i>Iguana iguana</i>	1	0	0	1
Sub total		37	28	78	143
Total		56	49	111	216
Lion and Tiger Safari					
<i>Mammals</i>					
<i>Sl.</i>	<i>Name of the animal & Scientific name</i>	<i>M</i>	<i>F</i>	<i>U</i>	<i>T</i>
<i>Schedule I and II species</i>					
1	Lion - Asiatic:- <i>Panthera leo persica</i>	1	0	0	1
2	Tiger - Royal Bengal:- <i>Panthera tigris tigris</i>	18	16	0	34
3	White Tiger-Royal Bengal- <i>Panthera tigris tigris</i>	4	2	0	6
Total		23	18	0	41
<i>Other Schedule Exotic species</i>					
1	Lion - Hybrid <i>Panthera leo</i>	16	15	0	31
Total		16	15	0	31
Elephant Care Centre					
1	Elephant Indian : <i>Elephas maximus</i>	4	9	0	13
Total		4	9	0	13
Herbivore Safari					
<i>Schedule I and II species</i>					
1	Black Buck : <i>Antilope cervicapra</i>	3	2	0	5
2	Gaur or Indian Bison:- <i>Bos gaurus</i>	3	2	0	5
Total		6	4	0	10
<i>Other Schedule Exotic species</i>					
1	Chital or Spotted deer : <i>Axis axis</i>	100	96	0	196
2	Barking Deer : <i>Muntiacus muntjak</i>	2	3	0	5
3	Sambar:- <i>Cervus unicolor</i>	83	87	0	170
Total		185	186	0	371
1	Sloth Bear:- <i>Melursus ursinus</i>	41	43	0	84
BFF Tiger					
<i>Sl.</i>	<i>Name of the animal & Scientific name</i>	<i>M</i>	<i>F</i>	<i>U</i>	<i>T</i>
1	Sumatran Tiger:- <i>Panthera tigris altacia</i>	1	0	0	1

- Unplanned layout with no consistence approach
- The unscientific enclosures built over the years not fulfilling CZA stipulations.
- There is no visitor circulation path to cover the entire area and see all the display in a organized manner.
- No planned road network within the zoo for the commutation of visitors, transportation of feed and fodder and shipment of animals.
- Lack of dedicated and planned water storage and supply system within the zoo.
- Lack of underground drainage and sewerage lines to carry the liquid waste disposal within the zoo
- Inadequate supply of power which affects the efficient management of office, zoo laboratory, zoo hospital, zoo ticket counter etc.,
- Inadequate number of visitor shelters and other visitor facilities within the zoo
- Inadequate number of rest lawns, gardens and parks in the zoo
- Inadequate facilities with reference to storage of food, kitchen and delivery of food, fodder and other articles.

2.3.4 VISITORS AMENITIES

2.3.4.1 General Information

Bannerghatta zoo being an integral part of Bannerghatta Biological Park attracts large crowd round the year. The landscape beauty of surrounding forest, the favourable climate and the transport facilities available favors the visitors to reach the place as and when they wish. On an average around 1.50 million people visit this place annually. Bengaluru being the metro city in the nation has become a place for large number of educational institute, I.T industries and other general industries wherein large number of youths are involved. Majority of youths from these institutions comes to the biological park to have recreation. Therefore, it is obligation on the part of management to provide all the civic amenities to the visiting tourists within the limits of BBP.

2.3.4.2 Parking facilities

The zoo has a dedicated parking area measuring roughly an extent of 02.00 ha facilitating visitors vehicle parking who visit to see the various units Zoo, Safari and Butterfly Park. Although, efforts are made to provide facilities for 2 wheeler and 4 wheeler parking, the present infrastructure, calls for the up gradation. The weekly holidays and other general holidays attracts huge crowd and a minimum of around



one to two thousand vehicle comes in a day. In all around two and half thousand vehicles will have the facility of parking at a time in the park. There was no dedicated parking area in the zoo, till 2005 as public used to park their vehicles in the open field and road side. It was during 2006-07 under a special project called Master Plan for the development of BBP with a state and central assistance, a separate area of 02.00 ha for parking the vehicle was identified and developed.



2.3.4.3 Drinking water facilities

It is estimated that, on an average around 04 to 05 thousand tourists, visits the park on daily basis. It is imperative on the zoo management to provide drinking water facility to all the visiting tourists. A rough estimate reveals that at least 5000 liters of potable water and another 5000 litres of domestic water requires per day. Bore wells are the only source of water as there is no water line running from Bengaluru to Bannerghatta. The water source from bore wells is inadequate to meet the demand of the par. Therefore, on regular basis the water is being imported from the private source on payment basis during summer and other crisis period.

Although, every year new bore wells are being drilled due to non availability of enough ground water even at the depth of 900 feet, the bores have failed to yield. There are 06 number of bore wells working with a total capacity of 4000 lph. Out of 06 bore wells 03 are abandoned and only 03 are in working condition. The zoo faces serious water crises during summer and mandates on the authorities to import the water from other sources. The availability of water from all these bore wells is about 40,000 LPD which is against the demand of 2.5 lakhs LPD per day. It is estimated that the demand will be doubled in the park in the forth coming years, as the park is being planned to expand. The natural tanks located within the zoo like part of Kavalkere, Bandekere and Benakanakere are also not supporting for the daily supply as they are seasonal.

2.3.4.4 Visitor shelters

There are only 03 pergolas constructed in the zoo area. Each one of them would accommodate around 20 people. There is great need to create as many visitors



shelter are required as most of the visitors are exposed to sun and rain during their traverse in the zoo.

There are around 50 benches fixed at different places to facilitate the visitors to sit and relax. Further, visitors also rest and relax on the open lawns and gardens and benches due to non availability of required shelter under the pergola. Over usage of lawns and garden and un manageable visitors crowd on weekends and holidays leads to destructions of lawns and plants in the gardens. The facilities provided in the zoo are totally inadequate.

2.3.4.5 Toilet facility

The visitors tend to use the latrines and urinals whenever they are out for long time on their holiday explorations. As there are large number of visitors always visits the zoo, the toilet facilities are must. Providing sanitary latrines and urinals is an important issue in the management of zoo. Presently there are 04 different units of toilet facilities created at different parts within the zoo limits. All the four toilet units has the facilities of 20 sanitary latrines and 25 urinals. The water required for maintaining these facilities is being shared out of the water kept for animal management. Therefore there is a need to create exclusive water facilities to maintain these units. There is a need for creating few more toilet facilities within the zoo limits as the existing ones are not enough to take the total pressure of visiting tourists.



2.3.4.6 Restaurants and hotels facility

KSTDC Ltd.,

Karnataka State Tourism Development Corporation limited, an under taking of GoK, under the control of state tourism department is running a hotel, Muyura Vanashree , in the vicinity of zoo. The land to an extent of 0.62 Ha has been given to KSTDC by BBP to run this facility on contract basis for period of 20 years of lease from 21st August, 2010. The snacks, food, beverages are being catered by this facility during the zoo timings. It is estimated around one thousand visitors are availing this facility on a day to day basis. The KSTDC authorities are paying the lease rent of 12,500/- on monthly basis to BBP for Mayura Vanashree Restaurant and two Kiosks which is liable for periodical renewal during the lease period on mutual agreement.

JUNGLE LODGES AND RESORTS

The Jungle Lodges and Resorts Ltd., are also running a restaurant namely the Hill View Restaurant within the zoo premises. There is a standing tripartite lease agreement between BBP, JL&R and KSTDC, which is valid for 20 years from 9th September, 2010. The monthly rent of Rs. 12,000/- is being paid by the JL&R to BBP. The land belongs to BBP, an extent of 0.60 Ha was originally given to KSTDC to establish a hotel and an Interpretation Center for providing facilities to the visiting tourists. Due to various administrative reasons the KSTDC has entered into a business agreement with JL&R to run the facilities without the knowledge of BBP. Although, there is tripartite agreement to conduct this business, the tenability of the lease is only between BBP and KSTDC and thus JL&R has no role except running the business of providing eatables and food to the visiting tourists. On an average 200 visitors avail this facility which would increase to 1000 people per day, once the proposed expansion of the zoo is done. No liquor is authorized to sell and serve in these two establishments. This facility also allowed to run based on the zoo timings only.

NATURE CAMP

Nature camp is an enclosure having an area of 2.5 Ha (6 acres) developed by the department of forest during 1990's for conducting camps to the youths and school children interested in nature study. It is situated to the south of herbivore

safari having 10 jungle tents and 3 log huts presently. Originally only the transitory tents accommodation was created with a dormitory. The student community from all over use to avail this facilities regularly. The department of forests have felt the need of professionalism in nature education and found out the Jungle Lodges and Resorts Limited as the suitable agency to carry out this work, as a result the Jungle Lodges and Resorts have taken over this property on lease basis during 2002 and running the Nature Camp with halting facilities. The original transitory tented accommodations have been replaced by semi permanent and removable tented accommodations with log hut facilities. The students and visiting guests are given lectures on nature and wildlife and taken for bird watching, trekking and botonization. In the evening films shows on forest and wildlife are shown. The visiting guests are taken to visit zoo, safari, Butterfly Park of Bannerghatta Biological Park.



The other information relating to nature camp facilities are as follows.

- The luxurious A/c Log-Huts-2 No's, 1 wooden cottage, 8 Swiss Tent's, 32 Dormitory Bed's.
- Auditorium with indoor facilities table tennis, Carom, etc.
- Conference hall for holding seminar, workshops and conference meeting
- Nature camp itinerary

A. Day - 1		Timings
1	Check in (Well-come Drink)	12:00 PM
2	Lunch	1:30 PM
3	Safari (Depending upon Day visitors)	2:30 PM
4	Visiting Zoo & Butterfly park	4:00 PM to 5:00 PM
5	Coffee/Tea	5:15 PM
7	Wildlife Movie	7:00 PM
8	Campfire	8:00 PM
9	Dinner	8:00 PM
B. Day - 2		
1	Wakeup call with Tea/ coffee	6:30 AM
2	Nature Walk/Trekking	7:00 AM
3	Breakfast	8:30 AM
4	Check out	11:00 AM

Kiosks

In addition, there are 04 more small shops permitted to run for catering the beverages, snacks and other confectionaries for the benefit of visitors. Out of four, 2 units belongs to KSTDC and other 2 units belongs to Karnataka Milk Federation (KMF). The outlets of KMF, are being managed by private individuals on outsource basis.

2.3.4.7 Transient business facility Petty shops

There were hundreds of petty shops illegally established by local people for their livelihood sustenance and scattered every where within the Bannerghatta zoo. The petty shops owners by virtue of being locals and mere existence around the zoo started persuading the government for allotment of a permanent area. The BBP authorities since inception have denied their request as it was not in consonance with the Wildlife (Protect) Act 1972. These shops were spread in a very haphazard manner in the open area within the zoo and they were creating all possible pressure from the local politicians to allow them to continue within the zoo “as is where is”

basis. This problem was chronically old and remained unsettled for nearly two decades. Many politicians and local leaders were involved in support of these foot path vendors who were carrying out the business within the zoo premises and littering the area. The expansion activities of the zoo was also stranded for more than 05 years due to non co-operation and periodical protests by these petty shop keepers. All the shop keepers are localities and few of them had lost their land through the acquisition for the development of Bannerghatta National park. Despite of several previous attempts of eviction, they succeeded to continue and remain at the same place due to strong support by local politicians. As it was imminent on the part of management, it was taken as a challenge, and with full guidance and support from Principal Secretary to GoK, Forest, Environment and Ecology Sri Koushik Mukharji IAS, all these 114 number of petty shop and mobile business vendors were successfully relocated outside the zoo during 2011-12 and on the advice of Governing council ZAK, the petty shop line was built and accommodated only the eligible 58 shop keepers in a recorded time span of just three months during 2012-13. Thus, all the 58 number of petty shops relocated and housed in newly built shopping lane during 2012-13. After availing the modern facilities provided to them by BBP, all the relocated vendors are very happy and leading fairly good life.

2.3.4.8 Vijaya Bank extension counter and ATM facilities

After a long persuasion with the Vijaya Bank authorities, they have sanctioned and established an extension branch of Vijaya Bank within the premises of zoo in the new entrance plaza during 2013. There was immediate need for the establishment of extension branch within the zoo to strictly account the day to day revenue collections of the zoo apart from serving to the visiting tourists and other commercial entrepreneurs running their business within the limits of BBP. Earlier the day to day revenue collected was directly handled by the staff members of Executive Director office and the remittance to the bank used to be done on the following day or 2 days later, if any holidays falls in between. This was leading to a question of safety, accountability of government money as per the financial norms of government transactions. Therefore it was decided to have an extension branch and the same has been established and is serving now for the benefit of BBP.

The Vijaya Bank authorities were also persuaded to establish a facility of ATM within the zoo limits of Bannerghatta. As a result an ATM was installed

during 2012 and the space on rent was provided to bank authorities. It is 24 hour facility being availed by visiting tourists, zoo employees and the local villagers. The present ATM facility is located at the entrance, and there is need for establishment of another ATM facility at new entrance plaza where maximum visitation is always noticed.

2.3.4.9 Transport facilities



It is estimated that around 50% of the total visitors to BBP are coming through the public transport system. The dedicated visitors comes from neighboring towns will avail the facilities of train up to Bengaluru Railway Station. The other local visitors and city dwellers would prefer to use the public transportation system to reach this place. Bannerghatta Biological Park being one of the most important tourist destinations attracts visitors around the city of Bengaluru and all other important towns around. Bangalore Metropolitan Transport Corporation (BMTC) is the sole authority to provide transport facilities. In order to ensure a good coordination between BBP and BMTC, it was decided to establish a Transit, Transport Management Centre {TTMC} in zoo limits during the year 2009-10. A bus stand namely TTMC was established to extend the transport facilities to the visiting public. The BMTC buses are operating from every nook and corner of Bengaluru city to facilitate public to reach the BBP. On an average around 25 BMTC buses are plying. It is in order to ensure proper exist and entry comforts, a bus station has been built in an area of 2.00 acres on collaborative approach. The land belongs to BBP and the investment cost for building the structure was met by

BMTC. This agreement stands for 20 years of time subject to renewal on mutual agreement. A non refundable lease deposit of Rs. 1.00 crore (Rupees one crore only) has been made by BMTC and bus stand facility is allowed to be operated on the annual lease fee of Rs. 50,000/- The facility has been put into use from 2009-10. The BMTC being tenant shall vacate the land whenever it is required to BBP.

2.3.4.10 Gate Revenue Management Service

Finance is the life line of any organization. The inflow of revenue will decide the financial strength and stability of the BBP. The efficient revenue management will always ensure the robust growth of the organization and in turn provide all comforts to its stake holders and clients. In the organization like zoos, the clients are the day to day visitors, the management staff and the inmate animals. The welfare of these clients is directly proportional to the quantum of revenue earned by BBP. Therefore the revenue realization matters utmost importance and for the efficient revenue management a collaborative approach with KSTDC Ltd has been adopted which is working out very well.

The visitor management is also equally important as they are the main source of revenue generation. Since the BBP did not have a trained personnel for these purpose, it was decided by the Zoo Authority of Karnataka to have a qualified entrepreneur to assist the BBP for its visitors and revenue management. As a result an MoU was worked out, to outsource the collection of gate revenue and management of visitors. Karnataka State Tourism Development Corporation Ltd., (KSTDC), a government of Karnataka undertaking has been entrusted with the responsibility of entrance gate management, revenue collection and the operation of buses for the Bannerghatta Safari visitors.

2.3.4.10.1 Ticket Counters

BBP has established an exclusive and spacious plaza for the ticket counter. There are 10 units of ticket counter for issuing the tickets. A dedicated counter is established for physically challenged and senior citizens. There is also a counter for student concessions and children entry. Women visitors will have the priority over male visitors. The entire ticket counter management is being done by KSTDC staff. The day to day collection done by KSTDC staff and monitored by ZAK officers. The daily revenue collected is directly remitted to the Bank on the same day by the

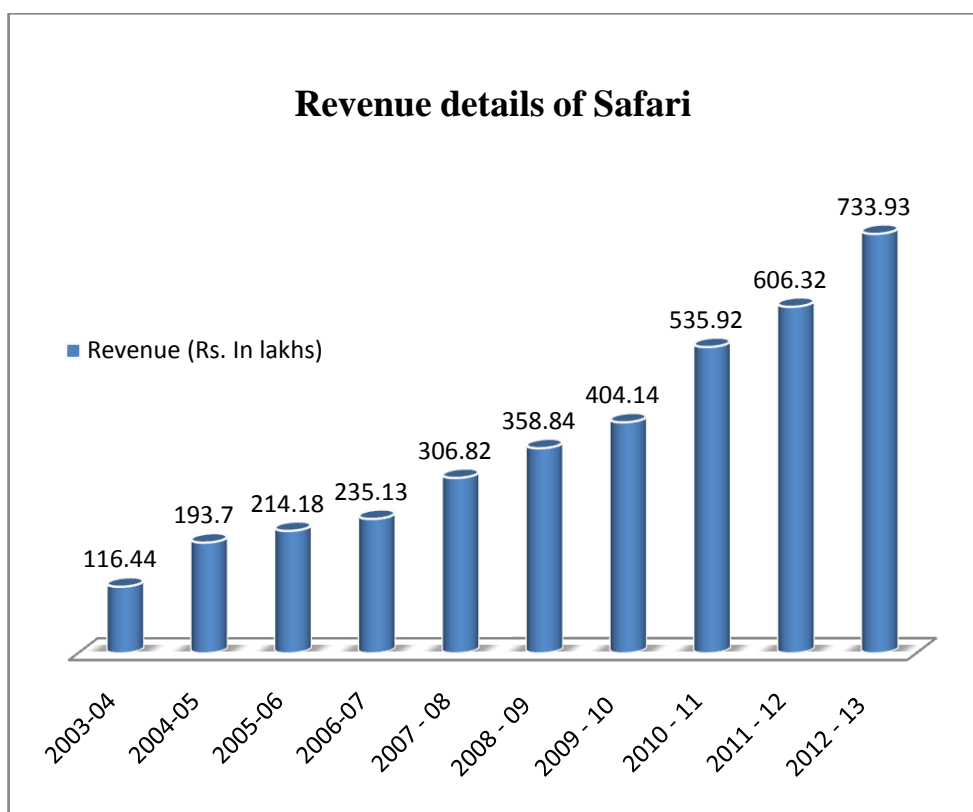
KSTDC with intimation to BBP. The revenue management of Bannerghatta Safari is given to KSTDC with a condition of operating the zoo counters on complimentary basis.



Old ticket counter



New ticket counter



2.3.4.10.2 Bus safari

Earlier BBP management had the control over the ticket issuing, gate management and operating the safari buses. It was in order to ensure the transparency, optimize the efficiency and also to overcome various logistic problems, the concept of decentralization was thought off. Accordingly KSTDC has been given the responsibility of revenue management and operation of safari buses. KSTDC is presently operating 20 mini buses with 30 seat capacity in each. All the visitors coming to enjoy the Bannerghatta Safaris will have this facility. The entry fee is fixed by the BBP authorities and the collection of revenue, monitoring the ticket counter and safari buses is the responsibility of KSTDC. It's a business of revenue sharing. Presently the sharing of revenue between BBP and KSTDC on 50:50 basis with reference to the safari entry only. There is no claim on revenue or even the claim on administrative cost rendered by the KSTDC towards gate revenue management of zoo.



There are two safari buses kept for operation by the park authorities for high end tourists. These two are the luxurious AC buses with better facilities. There will be an exclusive naturalist in these buses to conduct the tour and guide the visitors. The tariff for this bus safari on a package basis, which cost Rs. 500/- per head.

The park authorities have also kept, a dedicated services of Jeep Safari. There are three jeeps designed for the jungle safari and put for operation for the benefit of family or groups of number upto 4+1. The rate fixed for jeep safari is Rs. 2500/- per jeep per trip of one hour duration. The revenue collected from AC bus safari and Jeep Safari is credited directly to the zoo accounts. On an average the AC bus and Jeep safari earns around 78.45 lakhs annually.

2.3.4.11 Zoo auditorium facility

The growing awareness for nature and wildlife conservation has made zoos a popular institution. As zoos are visited by large number of visitors, zoos are a point a potent tool for education. It is to inspire among zoo visitors empathy for wild animals, an understanding and awareness about the need for conservation of natural resources, the involvement of every visitor is important. National Zoo Policy, 1998 also focus on a formal education programme. The visual media is one of the most

important tools of importing the knowledge of conservation in the minds of visiting tourists. Realising this importance, Bannerghatta Biological Park has established a dedicated auditorium within in the zoo premises. This auditorium is having the capacity of 150 seats, the films on conservation, nature education and wildlife management are screened on day to day basis for the benefit of interested visitors. The films are screened with a duration of one hour and on an average 3 to 4 films are screened on a day to day basis. The entry fee for the film show is Rs. 5/- per head. On weekly holiday and on general holidays 250 to 300 visitors avail this facility and on other days there will be less visitation numbering 50 to 100 members. On an average this facility generate the revenue of Rs. 50,000/- PM and around 6.00 lakhs annually.

2.3.4.12 Nature education facility

Bannerghatta Biological Park as a whole, do not have independent education officer to undertake the zoo education activity. However zoo authorities attend the trips organized by schools and colleges and education oriented visits undertaken by any other individual organization. The zoo authorities have identified facilities for the zoo education within the zoo premises in the complex of KSTDC - JL&R. This complex was originally built by the KSTDC in an area of 1.5 acres, wherein the open air theater and an interpretation room has been built. A tripartite memorandum of understanding between BBP, KSTDC and JL&R to spare half of the said building to use for the zoo education activities and balance half can be continued to use for running the zoo cafeteria. As per the instruction given by CZA in their 2010-11 zoo evaluation report, a compound wall has been built all around the building to enrich the beauty of this building and also to merge with surrounding. The environmental festivals such as **World Environment Day**, **World Earth Day**, **Wildlife Week**, and **Elephant Day** are being celebrated in this open air auditorium, apartment from conducting regular nature education classes to the visiting groups.

2.3.4.13 Zoo signage

At present most of the zoo education and zoo information about the displayed animals is done through signage at different enclosures, museum, zoo cafeteria, zoo ticket counter etc. Although, the signage of the do's and don'ts, general information to the public and also visitors route maps are not comprehensively drawn and

displayed, there are more a traditional sign boards to provide the basic information to the visiting tourists. Providing attracting and effective signage methods and interactive displays to explain various activities to the visitors is an integral part of the zoo education and management. It is being worked out to provide and establish a permanent and effective sign boards, pamphlets, brochures, etc., to upgrade the knowledge of visiting tourists to this zoo.

2.3.4.14. Zoo museum and Interpretation facility

Presently there is a small zoo museum attached to the zoo auditorium where few animal trophies are displayed for the benefit of public. It has been planned to establish a good museum and interpretation centre on the first floor of BMTC bus stand complex. The governments of Karnataka have ordered to BMTC, to spare the entire 600 square foot of area available on the 1st floor of BMTC building to establish a planned and well designed **nature museum of natural history and interpretation centre**. This entire area of 600 square foot in the 1st floor of BMTC complex to spare free of cost to the BBP till the lease stands between the BBP – BMTC. After the lease period is over the entire BMTC building will become the property of BBP as is where is basis.

2.3.4.15 Rock and Pre-historic Garden

As stated earlier, the topography of the BBP is blessed with beautiful geological formations like granite rocky outcrops, deep valleys, natural water bodies and rivulets interspersed with vegetation of dry deciduous habitat to wild animals found in nature. One such spectacular geological formation is the “**Mirza Hill**” with splendor of rocky outcrop. There are three life size man made prehistoric animal models of **Styracosaurus**, **Dimetrodon** and **Dinosaur**, erected by the **Zoological Survey of India**. This area is also being attracted by large number of youths for its



Dimetrodon



Styracosaurus

unique beauty and a curiosity to watch this unique animal model. The rocky outcrop abutting to this pre-historic area also gather huge crowd to rest and relax by watching the beauty of the surrounding forest landscape. It is proposed to develop this spectacular spot into a grand **Pre-historic cum rock garden** so as to add and accentuate the scenic beauty of the BBP. The animal models have not been painted and maintained regularly and this needs to be attended on priority.



Dinosaur



Rock Garden

2.3.5. Animal Section

Bannerghatta Zoo

The National Zoo Policy, 1998 stipulates the mandates on animal housing, their upkeep, collections and their health care in the zoo setup stating as follows

- Every animal in the zoo shall be provided housing, upkeep and health care keeping the longevity of their life and sustainability.
- The enclosures for all the species displayed in the zoo shall be of such size that all the animal gets adequate space for free movement.
- Each animal enclosures in a zoo shall have appropriate shelters, perches, wallow pools, drinking water facility etc.,
- Every animal shall be provided with diet of its natural kind with optimum quantity.

The above being the main philosophy of the animal management quite often most of the zoos do not adhere to the same, so also the Bannerghatta zoo as per its present standard.

2.3.5.1 Staff Strength

The Bannerghatta Zoo is one of the most important constituent of Bannerghatta Biological Park spread in an area of **12.54 ha** presently. The proposed expansion of the zoo in an area of **28.54 ha** is also being amalgamated in the old zoo area through a peripheral stone wall compound. Thus the total area of Bannerghatta zoo is **41.08 Ha (102.70 acres)**. The entire zoo has been brought under the administrative control of the Range Forest Officer. There is a Deputy Range Forest Officer to assist the Range Forest Officer in supervision of day to day activities and to control and manage the Forest Watchers and animal keepers. The Range Forest Officer is totally responsible for general administration of the zoo apart from other important responsibility like day to day maintenance, feeding, health care and general enrichment of the animal enclosures. It is for the management convenience the Bannerghatta Zoo has been divided into 4 sections.

Each of the section is presently controlled by a Deputy range forest officer and assisted by forest watcher who would directly report to the Deputy Range Forest Officer and further to the Range Forest Officer.

Statement of staff monitoring the Bannerghatta Zoo

Sl. No.	Category Posts	BBP ZOO
6	Veterinary Officer	1
11	Range Forest Officer	1
14	Assistant Curator	1
21	Forester	1
22	Horticulture Asst.	1
23	Animal Supervisor	2
26	Plumber	1
27	Electrician	1
29	Animal Keeper	14
31	Computer Operator	1
32	Forest Guard	4
33	Forest Watcher	4
34	Mahouts	10
35	Kavadi	10
36	Attender (peon)	1
38	Assistant Animal Keeper	5
39	Sweepers	13
Total		71

2.3.5.2 Duties and Responsibility

During 1991, the amendment brought to the Wildlife (Protection) Act 1972, provided for the enforcement of mandatory standards and norms for management of zoos through the Central Zoo Authority. Therefore the Central Zoo Authority being at the apex in the management of zoos prescribes the various methods and methodologies to manage the zoos. The management personal have the significant

role in displaying their collection and management of the inmate animals keeping the utmost care on their health and hygienic. Therefore every person from the level of keeper to the manager has the defined role and responsibilities in managing their collection as per the prescribed standard.

Following are the important duties and responsibilities of zoo personal involved in the management and upkeep of the zoo animals.

- The Deputy Director being the second in command is responsible for control, manage, of all the animals, visitors and staff members of the zoo.
- The Deputy Director is directly responsible for all happenings in the zoo and it is his primary duty to manage and monitor all events and eventualities if any within the zoo
- The Deputy Director shall assist the head of the organization ie Executive Director and work under the absolute instructions of head of the organization.
- The Range forest officer being the head of the zoo shall have the overall responsibility of control, manage and maintain the zoo and its inmate animals and personal apart from zoo visitors.
- The Range Forest Officer shall report to the Executive Director regarding the birth and death immediately followed by a detailed report.
- The Range Forest Officer being the in charge of all the inmate animals shall ensure timely procurement and supply food item including special diet if any day to day basis.
- The Range Forest Officer shall facilitate for the routine checkup, treatment, surgery for the animals under his control by duly involving the zoo veterinarian
- The Deputy Range Forest Officer shall assist the Range Forest Officer in overall management of the zoo and play a binding role between the keepers and Range Forest Officer in managing the animals and controlling the zoo activities.
- The Deputy Range Forest Officer being the second in command shall regularly monitor the feeding of animal and cleaning of animal enclosure and also observing the behaviour of inmate animals.
- The Deputy Range forest Officer shall maintain the attendance of the animal keepers and allot the work to the animal keepers on day to day basis.
- The Deputy Range Forest Officer shall conduct regular rounds to visit all the animals under his control.

- The Deputy Range Forest Officer shall submit report twice a day one at afternoon and another at evening to the Range Forest Officer.
- The Deputy Range Forest Officer shall ensure proper distribution of food to each animal under his control and ensure the deliver food to the respective animal within the time stipulated for feeding.
- Animal keeper shall carry out the task of cleaning the animal enclosures and maintains the sanitation and hygienics.
- Animal keepers shall be responsible for feeding the animal with right choice of food in good quality in prescribed quantity.
- The animal keeper is mainly responsible for identifying any abnormality and any change in the animals under his control.
- The animal keeper shall report, if any sickness, injuries, accidents are noticed in the animal enclosures under his control immediately to next higher authority.
- The animal shall be responsible to fill the daily, weekly, fortnightly, monthly and annual proforma as stipulated.
- Animal Keeper is responsible for secure, contain, catch the animals under his control for the purpose of observation, treatment, operation, exchange and shipment etc.
- The animal keeper shall be responsible for reporting birth and death to his immediate superior immediately after the event.

2.3.5.3 Status of animals



Bannerghatta Zoo did not have an approved animal collection plan to acquire and display within the zoo for the benefit of visitors, conservation, breeding etc. It was in a traditional manner and as and when the opportunities were there to acquire certain number of animals, efforts were made to enrich the animal stock. Most of the mammalian species presently housed in Bannerghatta Zoo are brought from various parts of the state as and when they were rescued from the wild. Few of them were brought here from other zoos also. The species of reptiles and birds are most of the time locally collected in addition to the exchange from other zoos. Therefore, the present animal stock inventory of the Bannerghatta Zoo does not provide scope for any thematic display. As there was no vision on the animal collection, the area of the zoo also not been classified to construct the animal houses on the basis of any theme. Therefore the present collection and display in this zoo is purely on ad-hoc basis.

The following is the animal stock inventory of Bannerghatta Zoo,

Statement of animal stock inventory including single and single sexed animals

<i>Sl. No</i>	<i>Name of the animal & Scientific name</i>	<i>M</i>	<i>F</i>	<i>U</i>	<i>T</i>
SCHEDULE I AND II SPECIES (WILDLIFE PROTECTION ACT)					
Birds					
1	Great Indian Horn bill : <i>Buceros vicornis</i>	0	1	0	1
2	Pea fowl Indian : <i>Pavo cristatus</i>	2	5	0	7
3	Spoon bill : <i>Platalea leucorodia</i>	1	0	0	1
4	Kalij Pheasant: <i>Lophurs leucomelana</i>	2	4	0	6
5	Fowl Jungle Grey : <i>Gallus sonnerati</i>	2	0	0	2
6	Red Jungle Fowl: <i>Gallus gallus</i>	7	3	0	10
Sub Total		14	13	0	27
OTHER SCHEDULE & EXOTIC SPECIES (WILDLIFE PROTECTION ACT)					
1	Baya Weaver : <i>Ploceus phillinus</i>	0	0	2	2
2	Budgeriger : <i>Melopsittacus undulates</i>	0	0	3	3

3	Cockatiels : <i>Nymphicus hollandicus</i>	8	7	0	15
4	Heron Night : <i>Nyctcoras nycticoras</i>	20	35	0	55
5	Ibis White : <i>Threskiornis acthiopica</i>	1	5	0	6
6	Love Birds : <i>Agapornis</i>	48	45	0	93
7	Munia Black Headed : <i>Lonchura punctuelata</i>	5	5	0	10
8	Barn Owl : <i>Tyto alba</i>	0	0	1	1
9	Eurasian Egle Owl : <i>Asio otus</i>	2	1	0	3
10	Parakeet alexandrine : <i>Psittacula euparia</i>	1	3	0	4
11	Parakeet rose ring : <i>Psittacula krameri</i>	17	4	0	21
12	Pelican Grey : <i>Pelecanus philippensis</i>	17	14	0	31
13	Red crested pochard : <i>Netta rufina</i>	2	2	0	4
14	Stork painted : <i>Mycteria leucocephala</i>	0	1	0	1
15	Golden Pheasant : <i>Chrysolophus pictus</i>	1	0	0	1
16	Emu : <i>Dromaius novaehollandiae</i>	3	4	0	7
17	Pea fowl white : <i>Pavo cristatus</i>	2	2	0	4
18	Lady Amherst's Pheasant : <i>Chrysolophus amherstiae</i>	2	2	0	4
19	Ostrich : <i>Chrysolophus amherstiae</i>	1	2	0	3
20	Chines ring necked Pheasant : <i>Phasianus colchicus torgatus china</i>	1	1	0	2
21	Black swan : <i>Cygnu atratus</i>	1	0	0	1
22	Silver Pheasant : <i>Lophra nycthemera nyctenera</i>	5	5	0	10
23	Green Winged Macaws : <i>P.Chloropterus</i>	2	2	0	4
24	Rhea : <i>Americana</i>	2	2	0	4
25	Amazon Parakeet : <i>Amazona amazona</i>	1	1	0	2
26	African grey parrot : <i>Psittacus erithacus</i>	1	1	0	2
27	Sun Conure Parrot : <i>Aratinga Solstitialis</i>	3	1	2	6
28	Black Crowned Crane : <i>Balearica pavonina</i>	1	1	0	2

29	Blue Gold Macaws: <i>Ara ararauna</i>	1	1	0	2
30	Palm Cockatoo: <i>Probosciger aterrimus</i>	1	1	0	2
31	Electus Parrot: <i>Electus roratus</i>	1	1	0	2
32	Sulphur Crested Cockatoo: <i>Cacatua galeria</i>	1	1	0	2
33	Scarlet Macaw: <i>Ara macao</i>	1	1	0	2
34	Galah Parrot: <i>Eolophus roseicapilla</i>	1	1	0	2
35	Mottled wood owl: <i>Strix ocellata</i>	0	0	2	2
36	Rainbow Lorikeet: <i>Trichoglossus hacatodus</i>	0	0	2	2
37	Red Lorikeet: <i>Trichoglossus rubritorquis</i>	0	0	6	6
Sub total		153	152	18	323
Total		167	165	18	350
Mammals					
SCHEDULE I AND II SPECIES (WILDLIFE PROTECTION ACT)					
1	Black Buck : <i>Antilope cervicapra</i>	4	11	0	15
2	Leopard : <i>Panther pardus</i>	12	12	0	24
3	Lion Tailed Macaque: <i>Macaca silenus</i>	1	1	0	2
4	Himalayan Black Bear : <i>Selenarctels thibetanuts</i>	4	2	0	6
5	Jackal : <i>Canis aureus</i>	2	3	3	8
6	Macaque Rhesus : <i>Macaca mulatta</i>	3	7	0	10
7	Common or Hanuman Langour: <i>Presbytis entellus</i>	1	3	0	4
8	Indian Giant Squirrel - <i>Ratufa indica</i>	1	2	0	3
9	Shanghai/Thamin Deer: <i>Cervus Eldi</i>	3	6	0	9
10	Mouse Deer: <i>Tragulus meminna</i>	0	1	0	1
11	Wild Dogs: <i>Cuon alpines</i>	2	0	0	2
12	Indian Grey Wolf: <i>Canis lupas pallipes</i>	3	0	0	3
Sub Total		36	48	3	87

OTHER SCHEDULE & EXOTIC SPECIES (WILDLIFE PROTECTION ACT)					
1	Hippopotamus : <i>Hippopotamus amphibious</i>	2	5	0	7
2	Porcupine : <i>Hystrix indica</i>	3	2	5	10
3	Cat Toddy : <i>Paradoxurus hermaphrodites</i>	1	1	2	4
4	Chital or Spotted deer : <i>Axis axis</i>	4	12	0	16
5	Marmosets: <i>Callithris goeldii</i>	1	0	0	1
6	Hog Deer: <i>Axis Porcinus</i>	5	8	0	13
Sub Total		16	28	7	51
Total		52	76	10	138
REPTILES					
SCHEDULE I AND II SPECIES (WILDLIFE PROTECTION ACT)					
1	Crocodile long snouted Gharial: <i>Gravialis gangeticus</i>	0	4	0	4
2	Crocodile Marsh : <i>Crocodylus palustris</i>	2	2	0	4
3	Indian - Rock Python : <i>Python molurus</i>	2	2	0	4
4	Cobra Indian : <i>Naja naja</i>	10	10	0	20
5	King Cobra: <i>Ophiophagus Hannah</i>	1	1	0	2
6	Viper Russells : <i>Vipera russelli</i>	4	2	2	8
7	Common Indian Monintor Lizard: <i>Varanus bengalensis</i>	0	0	1	1
8	Rat Snake: <i>Ptyas Mucousus</i>	0	0	30	30
Sub Total		19	21	33	73
OTHER SCHEDULE & EXOTIC SPECIES (WILDLIFE PROTECTION ACT)					
1	Snake Sand Boa : <i>Eryx conicus</i>	1	1	0	2
2	Tortise Indian Star : <i>Geochelone elegans</i>	4	5	0	9
3	Crocodile Caiman : <i>Crocodylus crocodylus</i>	15	11	0	26

4	Red - eared slider turtle: <i>Trachemys scripta elegans</i>	0	0	78	78
5	Batagar Terrapin or River Terrapin: <i>Batagar baska</i>	12	8	0	20
6	Indian Mud or Flapshell Turtle: <i>Lissemys punctata</i>	3	2	0	5
7	Morelet's Crocodile: <i>Crocodylus moreletii</i>	1	1	0	2
8	Iguana Green: <i>Iguana iguana</i>	1	0	0	1
Sub total		37	28	78	143
Total		56	49	111	216

Red Colour indicates single animals in the inventory

Green Colour indicates single sexed animals in the inventory

2.3.5.4 Constraints

The display of animals in the present day context in Bannerghatta Zoo is neither for an education nor for conservation values. The display is more for recreation to attract the visitors for ecorecreation value. Although there is a scope to provide enough space and optimum facilities the same as not been attended over the years and therefore many constraints have emerged out. The following are the pertinent constraints the Bannerghatta zoo is witnessing as on today.

2.3.5.4.1 Lack of adequate space

All the mammalian species are housed in very old and small cages where the animals are suffering without adequate space and congenial environment. The species such as Himalayan bear, black buck, Brow antler, Malabar squirrels, Leopards, Jackals etc are crowded together in a very small area. The life of these animals during the rainy period are miserable as the area remains in water log condition for more than 03 months.

The exotic enclosures such as Hippopotamus is very small and always facing the threat of insufficient water. As the population is being multiplied through in breeding not only results in overcrowding in the small enclosure but leading to genetically degeneration also.

The reptile exhibits are mostly the pits, wherein the species like King Cobra, Python, Viper, Iguana are also facing discomfort during rainy seasons as these pit/enclosures hold the rain water for one or two months.

The bird exhibits are very small and mostly the cages having no holding area which is must for their perching and breeding. Most of the water birds are exhibited in small and medium size aviary with artificial pond also facing the problem of shortage of water and insufficient area for their biological need.

2.3.5.4.2 Lack of adequate trained personal

As on today the zoo management is done through a contract and outsourced employees. They are not exposed for any kind of professional training and skill up-gradation programmes as their appointment is temporary.

2.3.5.4.3 Inadequacy in the habitat enrichment

Most of the display animals housed in the zoo are not provided with sufficient space. As there is inadequacy in the space and water, the concept of species specific habitat enrichment has not been carried out over the years. Therefore the animals housed in such enclosures are facing the threat of biological comforts and put into psychological stress.

2.3.5.4.4 Lack of proper drainage system

The concept of underground drainage (UGD) to dispose the liquid waste from the enclosure was not given due importance. Therefore most of the enclosures are lacking of proper drainage system, as a result the water logging and contamination take place in the vicinity of enclosures posing a threat of epidemics.

2.3.5.4.5 Lack of barricade system

Most of the enclosures do not have a well designed and strong barricade around them; as a result every visitor will have a direct approach with animal. This kind of direct approach to the caged animals provokes the visitors to tease and vandalize the animal.

2.3.5.4.6 Over crowding

It is due to lack of space and unplanned mixing many species of birds in the aviary facing the conflict for their existence and biological needs. The number of deers, crocodiles and snakes are more than the capacity of the enclosure size. Therefore very often infighting take place among themselves and leading to the casualties

2.3.5.4.7 Insufficient water

The lack of sufficient number of bore wells within the zoo premises leading to create crisis for water. As there is no perennial source of water in the zoo, the dependency is only on the bore wells. The existing 03 bore wells are not yielding the required quantum of water for the need of animals and their maintenance.

2.3.5.4.8 Inadequate clinical facilities

Although there is a veterinary hospital in the zoo, the infrastructure and the expertise available not in a position to meet the demand of all the animals housed in the park. The existing facilities in the zoo are also compelled to look after the animals housed in the safari and rescue center. Further the operation theater facilities and inpatient wards calls for the immediate up-gradation.

2.3.5.4.9 Lack of expertise

The expert in the clinical laboratory, zoo hospital and also to look after the zoo education and outreach activities apart from documentation of zoo related subject is a major constraint in managing the zoo and park efficiently.

2.3.6 BANNERGHATTA SAFARI

Introduction

Safari in the natural forest is expedition to observe the free range wild animals in their natural habitat. The visitors in the secured safari vehicle are allowed inside the safari, will have the thrill of wilderness by seeing them in the midst of the forest through a keen and closed observation. The Bannerghatta Biological Park is one of the pioneers in providing this facility to the visiting public. A portion of forests out of Ragihalli Reserve Forest has been identified and developed to conduct this activity.

The concept of jungle safari was thought off by the earlier foresters administered Bengaluru Forest Circle and Karnataka Forest Department during later part of 1970. As a result, various animal safaris have been established in the limits of Bannerghatta Biological Park.

Sl. No.	Name of the Safari	Extent	Name of the Forest	Year
1	Lion Safari	5.00 Ha	Ragihalli Reserve Forest	1979
2	Tiger Safari – 3 units	15.00 Ha	Ragihalli Reserve Forest	1987
3	White Tiger Safari	1.00 Ha	Ragihalli Reserve Forest	
4	Bear Safari	18.00 Ha	Ragihalli Reserve Forest	2002
5	Herbivores Safari	121.41 Ha	Bannerghatta Reserve Forest	

2.3.6.1 Lion Safari

It is an open enclosure created in an area of 5.00 Ha of Ragihalli Reserve Forest during 1979. All around the 5.00 Ha of forest area, a tall chain link mesh with the height of around 15 feet has been erected. Further a big moat all round the chain link mesh fence has been created to avoid the tress pass of any wild animals living in the area. This kind of double proof barricade helps in avoiding the conflict between inmate animals and free range wild animals apart from providing safety and security. The lion safari has entry at south-west corner and has the animal housing unit at north-eastern direction. The animal house is provided with 11 holding rooms and all

the 11 holding rooms are provided with retrieval area for the day time rest. This animal house is provided with squeeze cage facility to treat and attend the animal for the clinical observations. There are 03 such squeeze cages fitted to the rooms at the backyard.

The animal house has open drain to facilitate for the removal of solid and liquid waste generated in the animal houses. After sanitizing the animal houses regularly on day to day basis the animal excreta and the waste water is drained outside the animal house through the sanitary drainage built within the house.

The identified groups of animals are only allowed into safari on a rotational basis regularly for the benefit of visiting tourists.



Pride of lions in the safari

The animal house is well connected with water supply system. Every animal holding room has the facility of water troughs and the water supply is regulated through valves kept outside the animal house.

2.3.6.2 Tiger Safari

The tiger safari was established in 1987 in an area of 15.00 Ha in the Ragihally Reserve Forests. There are 3 different units in the tiger safari namely

- Indira Gandhi Tiger Safari – 6.00 Ha
- Appaiah Tiger Safari – 8. 00 Ha
- White Tiger Safari - 1.00 Ha

The peripheral boundary has been created for all the 3 units by digging open moat and erecting chain link mesh fence. Within the total of 15.00 Ha, 03 compartments have been created as mentioned above. Each of the safari unit is provided with animal housing complex.

There are 03 different unit of animal housing facilities in Indira Gandhi Tiger Safari. A new addition of housing complex was also made in the year 2012-13. The entire housing complex of Indira Gandhi Tiger Safari has the facility of 11 rooms, with facilities of 03 nos. of squeeze cage and retrieval area at their backyard and



provided with basic facilities of water and sanitation.

The Appaiah Tiger Safari has the facilities of 02 animal housing complexes. Both animal houses together has 10 animal holding rooms provided with basic facilities of water and sanitation.

The White tiger safari established in 1.00 Ha area, also has 02 animal housing buildings. There are totally 08 animal holding rooms with a facility of retrieval area and 03 squeeze cages at the backyard and provided with basic facilities of water and sanitation.



2.3.6.3 Bear Safari

It was during 2002, the park authorities have got an idea to establish an exclusive unit of Bear Safari. This safari has been established in an area of 18.00 Ha



in the Ragihalli State Forest during 2002. The Safari area is provided with peripheral open moat. The outer wall of the moat is embedded with stone slabs all around in

order to prevent the sloth bear escape or to avoid tress pass of any other free range wildlife into the safari. This safari is also provided with animal housing facilities in 05 blocks namely Panchavati, Chitrakuta, Kishkinda, Dr. G.K.V Block and Jambava. There are totally around 100 animal holding rooms with a facility of kitchen.



2.3.6.4 Herbivores Safari

It is an enclosure covering over an area of 68.00 in Bannerghatta Reserve Forest. It is believed that the Herbivores Safari was developed during 1970's but opened to public view during 2002. The entire area has been barricaded with stone



wall along with the additional support of solar power fence and Elephant proof trench (EPT). The vegetation in the safari is more favourable to the herbivore animals round the year as large number of fodder species like bamboo and anogassius intermitted with vast extent of foreshore area of the water bodies. The edible grass species such as sacharam, symbopogan and heteropogan are commonly seen in the grass land and constitute as the main fodder. Few patches of shorea telura also found within the safari and serving as the standing shade for the animals. There are 5 water bodies found in the safari area namely, Deepankere, Chennamanakere, Gowdanakere and Seegadikunte, Gowdanakere. These water bodies are remains perennial and serve as the source of water for the inmate animals during all the seasons. The animals found in the safari are Gaur, Sambar, Cheetal, Barking Deer, Black Buck and Nilgai. The other animals naturally found in the safari are wild boar, porcupine, pangolin etc., are also sighted frequently along with the other major mammals. The larger animals such as Gaur, Sambar, Cheetal, Barking Deer, Black Buck and Nilgai were brought and released here under the

rescue and rehabilitation programme. By virtue of living in this area since past 02 decades, all the animals are naturalized and their population is being multiplied.



2.3.6.5 Status of animals

The statement shown below reveals the status of the animals housed in each of the safari. Except the animals living in free range in the herbivore safari, all other carnivore and bears are closely monitored. Their diet management, care on health and hygienic and their behavioural biology is under the close supervision by the management staff such as animal keepers, Forest Watchers, Deputy Ranger Forest Officer and the Range Forest Officer. The population multiplication in the safari animals area also closely regulated by giving due importance to the planned and organized breeding as far as possible. The chances of inbreeding is controlled in order to ensure the genetical stability in the population. However inbreeding do take place by default within the safari animals mostly in the lion and tiger population.

<i>Mammals</i>		<i>Name of the safari</i>	<i>M</i>	<i>F</i>	<i>U</i>	<i>T</i>
<i>Sl. No</i>	<i>Name of the animal & Scientific name</i>	<i>Lion safari</i>				
<i>Schedule I and II species</i>						
1	Lion - Asiatic:- <i>Panthera leo persica</i>		1	0	0	1
<i>Other Schedule Exotic species</i>						
2	Lion - Hybrid <i>Panthera leo</i>		16	15	0	31
		Total	17	15	0	32
		Tiger Safari				
3	Tiger - Royal Bengal:-<i>Panthera tigris tigris</i>		18	16	0	34
4	White Tiger-Royal Bengal- <i>Panthera tigris tigris</i>		4	2	0	6
		Total	22	18	0	40
		Herbivore Safari				
<i>Schedule I and II species</i>						
5	Black Buck : <i>Antilope cervicapra</i>		3	2	0	5
6	Gaur or Indian Bison:-<i>Bos gaurus</i>		3	2	0	5
<i>Other Schedule Exotic species</i>						
7	Chital or Spotted deer : <i>Axis axis</i>		100	96	0	196
8	Barking Deer : <i>Muntiacus muntjak</i>		2	3	0	5
9	Sambar:-<i>Cervus unicolor</i>		83	87	0	170
		Total	191	190	0	381
		Bear Safari				
10	Sloth Bear:-<i>Melursus ursinus</i>		41	43	0	84

2.3.6.6 Staff Strength

All the safaris are brought under a management control of “Safari Range”, which is headed by the Range Forest Officer, Safari Range. The Range Forest

Officer, Safari Range is the overall in-charge of management, maintenance, enrichment, animal supervision and controlling all the activities pertains to management of safari. The other important jobs and responsibilities of the Range Forest Officer, Safari is to control, monitor and regulate the tourism traffic within the safaris.

The Deputy Range Forest Officer, Safari Range is the supervisory officer directly responsible for feeding, management of animals and maintenance of animal houses and safari enclosures. Every animal house is given with the support of an animal keeper and assistant animal keeper who are directly responsible for animal feeding, upkeep, enclosures cleaning along with maintaining sanitation and regulation of animal display into the safaris.

The statement of staff monitoring the Bannerghatta Safari is stated below

Sl. No.	Category Posts	BBP Safari
1	Range Forest Officer	1
2	Veterinary Officer	1
3	Assistant Curator	1
4	Forester	1
5	Animal Supervisor	2
6	Plumber	1
7	Animal Keeper	14
8	Computer Operator	1
9	Forest Guard	3
10	Forest Watcher	3
11	Attender (peon)	1
12	Assistant Animal Keeper	5
Gate operators		16

2.3.6.7 Safari Gate Operations

The visit of tourists to safari start from morning **9:00 AM** onwards. The Gate Operating staffs are to be in readiness by 9:00 AM to facilitate the entry of tourist vehicles into the enclosures. Although the zoo timings starts at 8:30 AM, the staff to report for duty requires 15 minutes at their work place. BBP is providing the facilities since 2012 to ferry the staff from zoo to the safari in the morning and safari to zoo in the evening by the park vehicle as a special arrangement. Each entry



[New Safari Road](#)

and exit gate in the carnivores and bear safari requires 02 men to operate the gate as the risk and danger always involved in this operation. There are 07 number of entry and exit gates provided in carnivores and bear safari. The herbivores safari also has 02 gates in operation and requires 02 persons to operate for the entry and exist of visiting tourists. The entry and exit gates of safari's requires 16 persons who are engaged on outsource basis from the nearby places.

2.3.6.8 Duties and Responsibilities

- The keepers of all the enclosures to make an intensive observation of the animal under their in-charge and report to the next authority within 9:00 AM in the morning.

- The supervising officer i.e. The Deputy Range Forest Officer to visit the safari's under his control and ascertain the situation to report to the next immediate authority.
- The Range Forest Officer in-charge of Safari Range to visit the different units under his control and report to the Executive Director for any happenings.
- The animal keepers to clean the enclosures within 10:00 AM in the morning and observe the animals under their in-charge till the food are provided.
- The animal keeper has to ensure the availability of water and release of animals into display area on rotational basis.
- The clinical staff headed by zoo doctor visits all the units to ascertain the health conditions of all the animals with a special visit to sick, injured and aged animals.
- The food has to be supplied to all the animals as per the feed schedule within the feeding time.
- All the animal keepers to supervise the feeding and ensure the close observation of feeding particularly to sick, injure and aged animals.
- All the animal houses to be properly locked to ensure the safety measure before they call off the work for the day

2.3.6.9 Feeding

- The animals housed in the herbivores are being fed in the morning by both green grass and concentrates (Wheat brawn, oats and mixed vegetables).
- The bears housed in the bear safari are being fed twice a day with mixed fruits, milk, bread, egg, honey and ragi porridge.
- All the carnivores housed in safari are brought under the afternoon feed schedule.
- The beef, mutton, chicken and fish supplied by afternoon and the same is cleaned and chopped into eatable sizes in the meat chopping house located in the premises of the rescue centre. The chopped meat is weighed and packed into container for the onward distribution to the respective animal houses. The meat supplied by the tender contractor is received at the meat chopping house weighed and certified by the doctor as to confirm whether it is fit for consumption. Only certified meat by the zoo veterinarian is allowed for feeding. The chopped packed meat is once again weighed at the animal house

to ascertain the quality and quantity and further checked by the officers on supervision before feeding.

2.3.6.10 Maintenance

The open enclosures of the safari and the animal houses are maintained by the Range Forest Officer in-charge of Safari Range as most of these works are to be attended immediately and seasonal in nature. The supply of water to all the animal houses and to the open ponds constructed in the enclosures has to be guaranteed on day to day basis as water is essential for the sustenance of animals. Further the water required for cleaning animal houses and open ponds also be guaranteed on day to day basis.

The animal excreta and the waste water generated out of cleaning the animal houses is being pushed through open drain built in animal houses to the soak pits. Only in case of lion enclosures the liquid waste generated from the animal house is let into the open area which often create un-hygenicness. The water bodies exist in the open enclosure are being maintained by deepening, desilting and bund consolidation as and when it is demanded to enhance the water impounding capacity. The regular weeding of safari enclosures are carried out twice in a year to ensure good view of the safari.

2.3.6.11 Safari Traffic Management

Karnataka State Tourism Development Corporation (**KSTDC**), Bangalore represented by its Managing Director entered into MOU with Zoo Authority of Karnataka(Bannerghatta Biological park) for operating the safari trips to the visiting tourists to **Tiger, Loin, Bear** and **Herbivore** safaris, which is totally called as the **Grand Safari**. This MOU stands for 20 years from the date of agreement from **07.04.2010** which is also stipulated in the agreement condition number 10.

KSTDC Ltd, has its branch office in the zoo premises at new entrance plaza, headed by a manager and assisted by supporting staff to supervise, monitor and issue tickets. There are **20 number of mini coach buses** deployed for this purpose and each bus is given with a driver and bus attendant who normally conduct the naturalist job to the visitors.

The grand safari trip includes visit to **Mirza hill, Herbivores safari, Bear safari, Lion safari** and all the units of **Tiger safari** (Appaiah tiger safari, white tiger

safari and Indira Gandhi Tiger safari). After the Indira Gandhi tiger safari the visitors are exposed to **jungle drive** can also be termed as **jungle safari** to a length of about **03 kms** on the road runs on the boundary of National Park and Biological Park. Visitors will have ample of chances to see free range wildlife including elephants in the Jungle drive. This entire trip of Grand safari is completed in an hour.

2.3.6.12 Safari Timing and Tariff

As per the article number 12 in the Memorandum of Understanding between ZAK (BBP) and KSTDC Ltd, the official timing is between **9.00 a.m. to 5.00 p.m.** only. All the units of Grand safari will be opened by 9.00 a.m. and remains open till 5.00 p.m. in the evening. The ticket counters start working from **8.30 a.m. to 4.30 p.m.** only, for safari entry because the visitors purchases ticket at **4.30 pm** will have time to visit the safari till **5.30 p.m.** and as the official timing of the safari is also ends at **5.30 p.m.** Further the safari animals will be taken into the enclosures around 5.00 p.m. for feeding. Therefore it is the management requirement to stop issuing the safari tickets at **4.30 p.m.** and to close the safari units by **5.30 p.m.**

Statement of Tariff for various entries in Bannerghatta Biological Park

Sl. No	Description	Adults	Children	Senior Citizen	Others
1	Zoo	Rs. 60	Rs. 30	Rs. 40	
2	Butterfly Park	Rs. 25	Rs. 15	-	
3	Grand Safari (Tiger , Lion, Bear & Herbivore)	Rs. 150	Rs. 70	Rs. 100	
4	Long trek/Natural walk through natural forest of bio-park & view bison, chital, sambar, black buck, crocodile etc., (1 ½ to 2 hours)	Rs. 70	Rs. 30	Rs. 55	
5	Short trek Nature walk through natural forest of bio-park & view bison, chital, sambar, black buck, crocodile etc., (1 hours)*	Rs. 45	Rs. 20	Rs. 30	
6	Special trips (only for safari)				
a)	AC Bus Service	Rs. 500/- per head			

b)	Jeep Service	Rs. 2500/- per trip
7	Others	
	a) Still Camera	Rs. 25
	b) Video Camera	Rs. 200

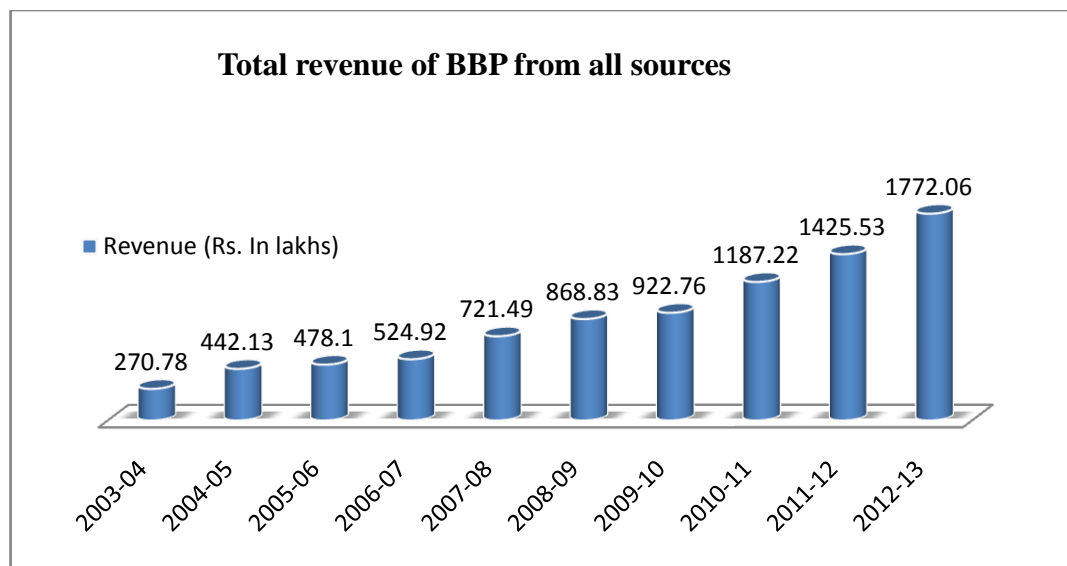
2.3.6.13 Safari Schedule

There are **20 buses** operating for the safari trips every day and the duration of each trip is around **01 hour**. On a given working day from 9.00 am to 5.00 pm with a lunch break of 30 min, each bus can make 07 trips. Accordingly if all the 20 buses are operated in a day, there will be **140 trips**. If it is presumed that each bus carries 30 **persons** (full capacity of the bus) a trip, in a day, one bus can make **07 trips** and can carry a maximum of **210 members**. Thus, if all the **20 buses** operate to its full capacity in a day **4200 members** can get the opportunity for the safari drive. On weekends and general holidays the **KSTDC** authorities also put additional buses to manage the rush. On some of the crowded days it is noticed that KSTDC authorities deploy 5 additional buses. In such special occasions 25 buses are deployed into service and a maximum of **5250 visitors** can get the chance of seeing the safari. This can be the **optimum carrying capacity of safari** visitation in a day. If any attempts are made to enhance the number of trips beyond **07** to each of the bus and number of buses beyond **25** in a given day will exert unbearable pressure on the safari animals and becomes unmanageable task by the safari management staff. Therefore, the permission shall not be given to **KSTDC** to operate beyond 07 trips per bus in a day and beyond **25** buses for safari trips in a day.

In addition to this the BBP also operating two AC buses and three Jeeps for the safari on all days. The park will extend this facilities normally to the VVIPS, VIPS and visiting guests like donors, animal adopters, study trip professionals and students and government guests who are directly or indirectly contributing for growth of the park. This facility to satisfy the park guests is warranted and park authorities are obligated to extend. Whenever the park vehicles are not needed for the committed guests, they are used for the business trips to the safari and the revenue earned will directly credited to the park accounts.

2.3.6.14 Revenue Management

It is a **revenue sharing model** between the **ZAK (BBP) and KSTDC** on **50:50 ratio**. Presently KSTDC Ltd is operating 20 mini coach buses on a day to day basis for the benefit of visiting tourists to **Grand safari**. The ownership and management of buses including drivers and bus attendants is the responsibility of KSTDC. Further KSTDC also operate the 10 ticket counters with their manpower and infrastructure in the facilities provided to them. The BBP has given the space for operating the ticket counter and their office at free of cost. The KSTDC Ltd is issuing the ticket for Safari, Zoo, Butterfly Park and any other kind of entry which BBP introduces as and when the situation demanded. 50% of the gate revenue of grand safari is deducted at source and balance 50% along with the gate revenue of Zoo, Butterfly Park and any other collection will be accounted to the BBP in the same day evening. BBP Authorities, after ensuring the proper account maintained by the KSTDC Ltd collect the revenue and in turn remit to the BBP banker i.e. extension counter, Vijaya Bank, Bannerghatta Zoo. The BBP have given space to Vijaya Bank to open an extension branch in the new entrance plaza during 2012, with an intension to manage and account the BBP gate revenue and other transactions.



2.3.6.15 Safari Visitors Circulation

The tour in **Grand Safari** has a defined route for facilitating visit to all the units of safari including drive through in the forest. The grand safari would start from the **boarding point** after obtaining the clearance and will pass through the

entrance gate in front of Butterfly Park and take a right direction to enter into the **Gajapath Road**. The jungle view to the visitor to enjoy the beauty of landscape is shown on the top of **Mirza hill** where visitors can have the panoramic view of the park. The vehicle will stop on the hill top for 05 minutes and the visitors are educated through a briefing regarding the **landscape, wildlife** and other **cultural history** of the area. From Mirza hill the safari vehicle would move back and join the **Gajapath road** and take left turn to enter into the **Herbivore Safari**. Visitors are allowed to see and enjoy the different herbivore animals in habituated in the safari like gaur, nilgai, sambar, cheetal and wild boars. In addition to these large mammals, the herbivore safari is also abode for varieties of bird population including the **aquatic birds** live in the water bodies located within the park. Visitors will get a opportunity to see the rare sighting of Marsh **Crocodiles** more commonly in the water bodies located in the herbivore safari. The total time required for viewing entire herbivore safari would be 20 minutes.

After the exits from the herbivore safari, visitors will have a chance to drive through a wilderness area to a length of more than a kilo meter. In this jungle drive chances of seeing wild elephants and other wild animals are bright. The second destination in the grand safari trip is **Bear Safari**, which is established in an area of about **20.00 Ha** within the Ragihalli Reserve Forest. The good road network available within the bear safari would take at least 15 minutes to complete the drive and see the sloth bears in the free range in this safari.

After the exit of bear safari, visitors are taken to **Lion Safari** which is located about 200 meter away. The lion safari also been located in the Ragihalli Reserve Forest and the total extent of the area is only **6.00 Ha**, where the visitors would see the **pride of lion** moving freely in the safari and then proceed to **Tiger Safari**.

The **Tiger safari** having an extent of **14.00 Ha** exhibits both **White Tiger** and **Royal Bengal Tiger** in group. The exit of tiger safari will complete the tour in the grand safari and further continued with **jungle safari** to a length of **5.00 km** till the **Butterfly Park**. The visitors are taken on the jungle road located on the demarcation line between National Park and Biological Park. On either side of this entire 5.00 km length, the existence of good forests and water bodies will provide more chance to visitors of seeing the wild elephants and other free ranging wildlife. With the arrival at Butterfly Park entrance, the safari trip is completed. The time targeted to complete this trip is roughly one hour. Afterwards, the visitors can see the butterfly park.

2.3.6.16 Constraints

Despite of sustained efforts for better management there are still few constraints which are listed below.

- Inadequate man power
- Inadequate water supply
- Lack of sanitation
- Overcrowding of animal population in all the safaris
- In adequate space both in animal houses and open enclosures
- Lack of onsite veterinary care



New Safari Road

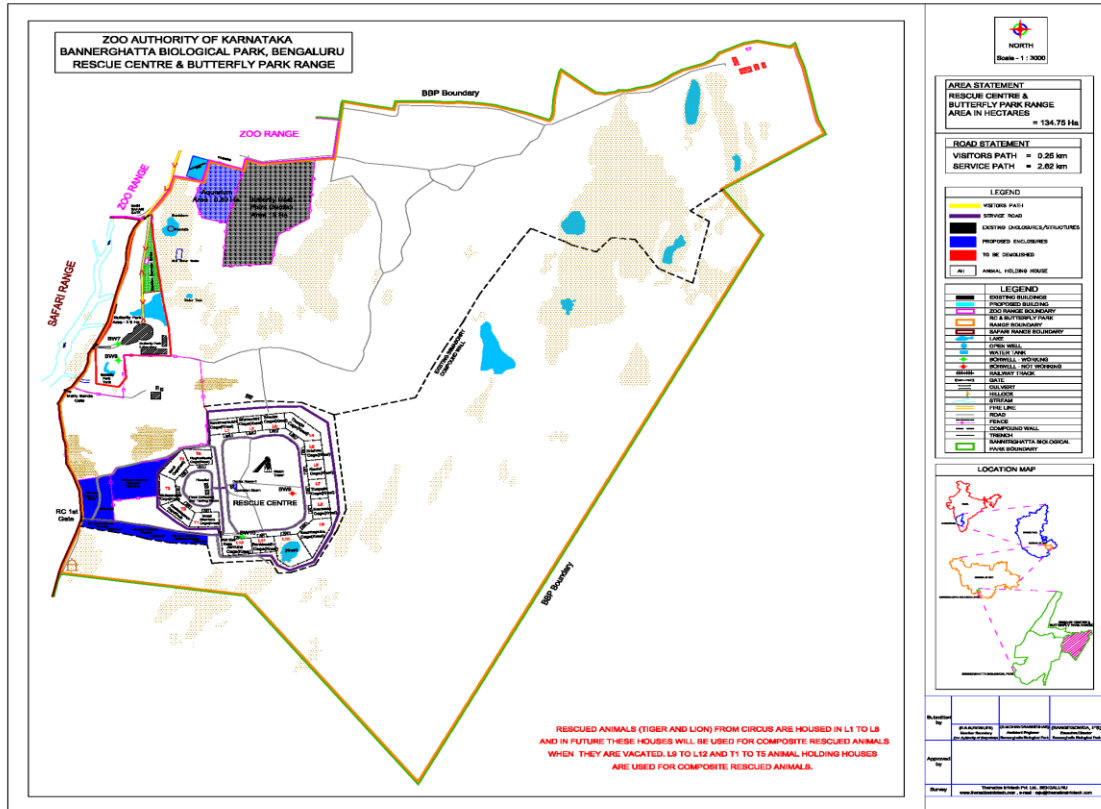
2.3.7 RESCUE CENTRE

The **National Zoo Policy 1998**, provides opportunity to all the zoos to function as rescue centre for **orphaned, refused, rescued wild animals** subject to the availability of appropriate housing and up keeping facilities. It also mandates that this kind of facility should not be kept for display. Accordingly the **Central Zoo Authority, MoEF, GoI** has provided an opportunity to BBP to establish the “**The Rescue and Rehabilitation Centre**” in the limits of Bannerghatta Biological Park. The park authorities having accepted the offer of establishing the Rescue Centre have explored the availability of suitable area. After the detailed exploration in and around BBP finally identified **17.50 Ha** of area within the Biological Park limits. Thus the Rescue Centre was **established during the year 1999** for rehabilitation of rescued animals from the various means, with a project cost of Rs. **227.00 lakhs**. The Rescue Centre such established started functioning from **December 2000** as an **off-display area**.

2.3.7.1 The layout plan

i. **Lion block**

The Rescue Centre spread in **17.50 ha** area having 02 compartments one each for **Lions** and **Tiger**. The lion block is called as L- block having facility for housing **72 lions**. It is a semi circle building complex having 12 independent houses. Each house has 06 animal holding rooms having a common open enclosure ranging from 1.0 to 2.0 acres in area. The entire L- Block is not covered with either elephant proof trench or boundary wall at the periphery. Therefore the area where the fence is directly opened to forest faces the damages from wild animals regularly and the regular conflict between **wild elephants and inmate lions** noticed very frequently.



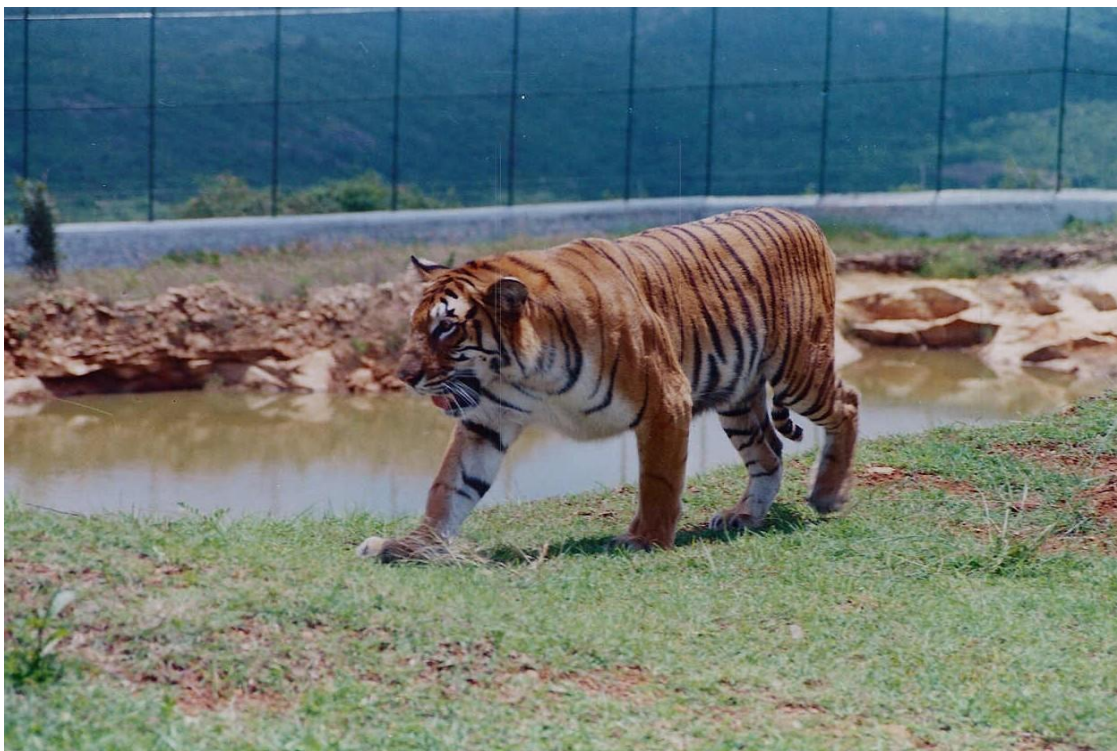
Since the enclosures are built on a barren area devoid of tree cover doesn't offer the required shade to the animals during summer. Every open enclosure is



provided with small ponds to ensure the water. However, due to lack of sufficient water, the water ponds remains dry for maximum period of time in the year. The entire complex including all 12 animal houses is provided with a simple UGD network grouping 03 to 04 house into one soak pit. The night soil from the soak pit is periodically removed and pit is sanitized.

ii. Tiger block

Right opposite to the lion block another semicircular housing complex namely T - block of half of the size of L- block has been constructed for tiger. There are 05 housing units in this block and each of the housing unit has 06 animal holding rooms provide the facility for housing at least six animals. Every housing unit is provided with common water supply and sanitation lines. In addition, a facility has been created to harvest the roof water during the rainy season.



iii. Meat Rooms

Further 02 independent rooms are constructed to clean and chop the meat before distribution to the animals. There is a veterinary clinic with transit facilities for storing the emergency medicines created and the veterinarian's looks after the rescue center is operating from the clinic being available to the animals throughout the day and even in the night during emergencies.

2.3.7.2 Status of animals

The statement of Rescued animals housed in the centre

Rescued tiger and lions from circuses		M	F	Total
1	Lion - Hybrid Panthera leo	20	18	38
2	Tiger - Royal Bengal:- <i>Panthera tigris tigris</i>	0	1	1

Safari lions and tiger				
1	Tiger - Royal Bengal:- <i>Panthera tigris tigris</i>	4	6	10
2	Lion - Hybrid <i>Panthera leo</i>	4	2	6
Rescued leopards				
	Leopard : <i>Panther pardus</i>	6	12	18

All the Lions housed in the rescue centre are rescued from various circus after banning the animal performance by the **MOEF, GOI**. In addition large number of rescued Leopards which were conflict making with people are also rescued from the forest and rehabilitated in this centre.

2.3.7.3 Staff Strength

The rescue centre along with Bannerghatta Butterfly Park is independently controlled by the Range Forest Officer. The Range Forest Officer is overall in-charge of Rescue and Rehabilitation Centre and all the house keepers and supervisory level officers are directly subordinate to the Range Forest Officer. The Deputy Range Forest Officer is the supervisory level officer controlling each of the animal houses and manage every rescued animal with humility in scientific manner.

In addition to the rescued tigers, large numbers of leopards are housed in these units which are rescued from various parts of the state. Each animal house is directly managed by an animal keeper. The details of staff provided for working in the rescue centre of BBP is as detailed below.

Sl. No.	Category Posts	BBP Rescue Centre
1	Range Forest Officer	1
2	Veterinary Officer	1
3	Assistant Curator	1
4	Forester	1
5	Horticulture Asst.	1
6	Animal Supervisor	1
7	Plumber	1
8	Electrician	1
9	Animal Keeper	12

10	Computer Operator	1
11	Forest Guard	3
12	Forest Watcher	3
13	Attender (peon)	1
14	Assistant Animal Keeper	5
Total		33

2.3.7.4 Duties and Responsibilities

- The keepers of all the enclosures to make an intensive observation of the animal under their in-charge and report to the next authority within 9:00 AM in the morning.
- The supervising officer i.e. The Deputy Range Forest Officer to visit the centre under his control and ascertain the situation to report to the next immediate authority.
- The Range Forest Officer in-charge of Rescue Centre to visit the Rescue Centre under his control and report to the Executive Director for any happenings.
- The animal keepers to clean the enclosures within 10:00 AM in the morning and observe the animals under their in-charge till the food is provided.
- The animal keeper has to ensure the availability of water and release of animals into display area on rotational basis.
- The clinical staff headed by zoo doctor visits all the units to ascertain the health conditions of all the animals with a special visit to sick, injured and aged animals.
- The food has to be supplied to all the animals as per the feed schedule within the feeding time.
- All the animal keepers to supervise the feeding and ensure the close observation of feeding particularly to sick, injure and aged animals.
- All the animal houses to be properly locked to ensure the safety measure before they call off the work for the day

2.3.7.5 Feeding

- All the carnivores housed in safari are brought under the afternoon feed schedule.
- The beef, mutton and chicken supplied by afternoon and the same is cleaned and chopped into eatable sizes in the **meat room** located in the premises of the rescue centre. The chopped meat is weighed and packed into container for the onward distribution to the respective animal houses. The meat supplied by the tender contractor is received at the meat room for chopping, weighed and certified by the doctor as to confirm whether it is fit for consumption. Only certified meat by the zoo veterinarian is allowed for feeding. The chopped

packed meat is once again weighed at the animal house by the individual house keepers to ascertain the quality and quantity and further checked by the officers on supervision before feeding.

2.3.7.6 Maintenance

The open enclosures of the rescue centre and the animal houses are maintained by the Range Forest Officer in-charge of Rescue Centre as most of this works are attended immediately and few are seasonal in nature. The supply of water to all the animal houses and to the open ponds constructed in the enclosures has to be guaranteed on day to day basis as water is essential for the sustenance of animals. Further the water required for cleaning animal houses and open ponds also be guaranteed on day to day basis.

The animal excreta and the waste water generated out of cleaning the animal houses is being pushed through open drain built in animal houses to the soak pits. Only in case of lion enclosures the liquid waste generated from the animal house is let into the open area which often creates un-hygenicness. The water bodies exist in the open enclosure is being maintained by deepening, desilting and bund consolidation as and when it is demanded to enhance the water impounding capacity. The regular weeding of safari enclosures is carried out twice in a year to ensure good view to monitor the movement of these old and injured rescued animals.

2.3.8 WILDLIFE RESCUE AND REHABILITATION CENTRE (WRRC)

The Wildlife Rescue and Rehabilitation Centre having its office at no. 102, Landmark Apartments, Mohan Ville, Langford Town, Bengaluru 560025 and which is headed by a Chief Trustee, entered into an **agreement on 15th March, 2000 with Department of Forest, Government of Karnataka** having its office at Bannerghatta National Park, Bannerghatta, Bengaluru-560083. It is represented by Deputy Conservator of Forest Bannerghatta National Park for establishment of **WRRC** in the limits of Bannerghatta Biological Park for a period of ten years to run the rescue and rehabilitation centre in an area of 07 acres 25 guntas. Further **on 22-01-2003 a supplementary agreement** was executed between the then **PCCF (Wildlife)** and **Chief Trustee of WRRC** to extend the period of contract from **10 years to 30 years**. Accordingly the Rescue and Rehabilitation Center has been established in the area identified and the facility now is in existence carrying out some small activities. Such facility created within the limits of Bannerghatta

Biological Park also given the recognition by the **CZA under 38H (6) of the Wildlife (Protection) Act, 1972**. The said recognition was in force till the period of **31-03-2009**. The Central Zoo Authority vide letter, F. No. 22-32/2004-CZA (430) (M)/2429 dated 14-03-2013 have not renewed the said recognition. Therefore the WRRC exists in the limits of BBP without any recognition and the activities carried out by them presently are not in consonance with Wildlife (Protection) Act, 1972. Therefore if the activity is to be carried out by them to be recognized legally by the competent authorities or to work directly under total control of BBP. Accordingly the existence of WRRC within the limits of BBP has to be dealt by the BBP authorities legally.

The birds and animals housed in the WRRC are to be shifted to life care facility planned to be constructed in the RC area. However, due to any administrative reasons if the construction of life care facilities is delayed, the animals and birds housed at WRRC are to be moved to the Rescue Center for temporary housing till the life care facilities are constructed.

2.3.8.1 BORN FREE FOUNDATION

Born Free Foundation an abroad based Charitable organization, having its office at **3 Grove House, Foundry Lane, Horsham, West Sussex, RH135 PL, United Kingdom**, the agreement with **Zoo Authority of Karnataka** to run life time care for the rescued tigers from **London Circus**. The Memorandum of Understanding between Zoo Authority of Karnataka and Born Free Foundation expired on **31st March 2011**. Consequent to the expiry of MoU and as per the recommendations of Executive Director, BBP and Member Secretary, ZAK and also the PCCF (Wildlife) the Born Free Facility was closed on **27-02-2013 on the orders of Executive Director, Bannerghatta Biological Park vide A2/BBP/BFF/MoU/2012-13 dated: 27-02-2013**. Since then the facility is under the absolute control of Bannerghatta Biological Park, Bannerghatta and being used by the park authorities.

Therefore the infrastructure like, buildings, animal enclosures, animal cages etc, created while Born Free Foundation was in existence has already been taken over by the BBP as their MoU period is over. The lonely **Sumatran Tiger** housed in the centre has been taken into the BBP stock. Therefore, the entire available

infrastructure in the BFF area is amalgamated into Bear safari as is, where is basis. If the activity is to be carried out by Born Free Foundation, to be recognized or to work directly under the control of BBP

<i>List of animals housed at BFF facility presently</i>					
<i>Sl. No</i>	<i>Name of the animal & Scientific name</i>	<i>M</i>	<i>F</i>	<i>U</i>	<i>T</i>
1	Sumatran Tiger:- <i>Panthera tigris altacia</i>	1	0	0	1
2	Tiger - Royal Bengal:- <i>Panthera tigris tigris</i>	3	0	0	3
Total		4	0	0	4

2.3.8.2 WILDLIFE SOS

The existence of **Wildlife SOS** arises due to an agreement between **MS, ZAK** and **Wildlife SOS** during **November 2005**. As a result an area on 8.00 acres within the existing bear safari was allowed to use by the Wildlife SOS for providing the maintenance care to the rescued dancing bears brought from outside legally. This agreement has the currency period of 10 years and will comes to an end on **30.11.2015**.

During **2009-10** Wildlife SOS authorities have voluntarily constructed 02 animal house complexes with kitchen facilities. They are named as **Dr. G.K.V block** and **Jambava block**.

The Zoo Authority of Karnataka in their 120th Governing Council Meeting have resolved to stop the services rendered by Wildlife SOS and close their activities as soon as the MoU period is over on 30-11-2015.

However the Government of Karnataka has permitted for the renewal of MoU by extending another 20 years vide letter No. AaPaJee/326/FWL/2013 dated: 10-12-2013.

In the approved Master Layout Plan, the Central Zoo Authority has informed to shift the rescued bears from Bear Safari area to Life Care Centre at Rescue and Rehabilitation Centre. This has to be done as soon as the establishment of Life Care Centre at Rescue Centre.

2.3.8.3 Constraints

- Inadequate clinical facilities
- Inadequate animal care due to lack of professionalism
- Inadequate water supply
- Lack of sanitation
- Inadequate number of animal keepers
- Lack of training

2.3.9 BUTTERFLY PARK

Introduction

The Global Conservation Community and the Convention on Biological Diversity have come out with an idea to conserve the species which are under severe pressure among the invertebrate group also. The butterfly community is one of the most important invertebrate animal having large number of species, attracts the attention of common man also, for their excellent beauty. Butterflies apart from their existence value also have the ecological and economical value. Most of the butterfly species are disappearing before the realization of their existence due to various human pressures. There are only few countable institutions in the global scenario who have initiated conservation measure to protect and perpetuate the butterfly species.



Innaugration of Butterfly Park by Hon'ble Union Minister Sri Kapil Sibbal

In the Indian context not much of conservation measures are initiated. There are not many scientific institutions undertaken this subject seriously which has equal tourism value, but many research activities are being carried out for their ecological value.

The Bannerghatta Biological park authorities have visualized the concept of establishment of Butterfly Park way back in 2001. As a result, the

Bannerghatta Butterfly Park emerged out as a collaborative project of State Government with Government of India.

The Zoo Authority of Karnataka (ZAK) with Department of Biotechnology (DoBT), Government of India, have jointly initiated the project with the financial outlay of **297.85 lakhs** during the year 2003 under a special master plan. The construction work initiated in 2003 was completed during 2007 and opened to the public for visitation. It is the unique project in the entire country carried out in an area of **4.00 Ha** with a main dome of 882 m². It is serving as a role model in the



nation, and most of the Zoos and parks interested to establish Butterfly Park are using this as knowledge hub and plan to replicate.



Parliamentary delegates visited to Butterfly Park

2.3.9.1 Collection of Species

There are more than 40 species of butterflies in the collection list of Bannerghatta Butterfly Park. Efforts are continuously made to display large number of butterflies with a large number of species. At present the importance is given on local species and during next couple of years efforts will be made to breed and display the butterflies of the region. The list of butterfly species propagated and displayed in the Butterfly Park is as listed below,

Statement of Butterfly species displayed in the park

Sl.No	Common Name	Scientific Name
1	Crimson Rose	Pachliopta hectare
2	Common Rose	Pachliopta aristolochiae
3	Blue Bottle	Graphium sarpedon
4	Common Jay	Graphium agamemnon
5	Sport Sword Tail	Graphium nomius
6	Common Mime	Papilio clytia
7	Lime Butterfly	Papilio demoleus
8	Common Mormon	Papilio polytes
9	Blue Mormon	Papilio polymnestor
10	Common Emigrant	Catopsilia pomona
11	Mottled Emigrant	Catopsilia pyranthe
12	Grass Yellow	Eurema hecabe
13	Common Jezebel	Delias eucharis
14	Psyche	Leptosia nina
15	Common Gull	Cepora nerissa
16	Pioneer	Anaphaeis aurota
17	White Orange Tip	Ixias marianne
18	Yellow Orange Tip	Ixias pyrene
19	Common Wanderer	Pareronia valeria
20	Tawny Coster	Acraea violae
21	Common Leopard	Phalanta phalantha
22	Common Castor	Ariadne merione
23	Plain Tiger	Danaus chrysippus
24	Blue Tiger	Tirumala limniace

25	Striped Tiger	Danaus genutia
26	Common Crow	Euploea core
27	Red Pierrot	Talicauda nyseus
28	Brown Awl	Badamia exclamationis
29	Three-spot Grass Yellow	Eurema blanda
30	Giant Redeye	Gangara thyrasis
31	Indian Skipper	Spialia galba
32	Spotless Grass Yellow	Eurema laeta
33	Crimson Tip	Colotis danae
34	Common Sailer	Neptis hylas
35	Malabar Tree Nymph	Idea Malabarica
36	Common Pierrot	Castalius rosimon

2.3.9.2 Butterfly Garden:

This is an area of 0.8 Ha consisting open garden and a big dome measuring of **882 m²**. Large numbers of flowering plants are raised in the open garden on either side of walking path to attract the butterflies. As a result large number of different species of indigenous butterflies are found round the year. The nectar dependent butterflies, mud paddling, dung paddling and swampy area butterflies are commonly found in the open garden area. As they are found in free range in large number the visitors would like to see them in a closer look within the dome and enjoy.

A large water body has been created within the dome and varieties of nectar plants are encouraged to grow within the dome. Further small patches of swamps are created and maintained to inhabit the mud paddling and swamp paddling butterflies. The maintenance of temperature between 18⁰ to 20⁰ celsius within the dome is must, as most of the species of butterflies cannot withstand the temperature beyond **21⁰** celsius in addition to following steps

- Change the landscape, exhibits including plants at least once in three years
- Interior of the doom to be cleaned at least once in a year
- Annual maintenance and repairs of interiors of the dome including air condition equipments to be changed at least once in a year.
- Number of species may be increased at least 2 to 3 species in a year
- Butterfly oriented gift shops to be established
- Workshops and seminar on butterfly conservation to be conducted periodically.

2.3.9.3 Butterfly breeding

Unlike the vertebrates the breeding and management of any invertebrate species is a challenge. Without applying the scientific knowledge the breeding program cannot be successful. However there is a facilities created for the in house breeding of few species of local varieties and it is being planned to upgrade the facilities by providing modern technologies.

2.3.9.4 Host plant Garden

There are 15 different species of butterflies which are locally found, attracts the attention and also sensitize the concerned authorities for their propagation and



display. The Bannerghatta Butterfly Park has created a host plant garden in an area of around **4.00 Ha**. The important host plants of different species of butterflies are planted and nursed in the host plant garden. The leaves of host plants are used for feeding the caterpillar before releasing them into the dome of butterflies.

2.3.9.5 Rearing the Butterflies

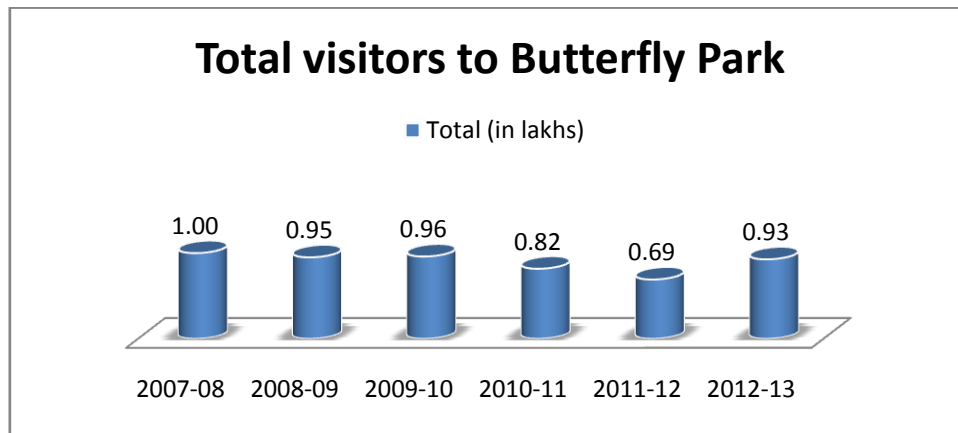
The occurrence and distribution of butterflies in nature is seasonal. All the species available locally collected and reared in the air conditioned facility specially



created. Once the caterpillar attains the butterfly stage through the process of metamorphosis they are released into the dome for public display. The butterfly would live maximum for a week before the death.

2.3.9.6 Visitation

On an average 500 tourist visits the Butterfly Park every day. The visitor's pattern for last few years is as stated below,



The revenue realized from this establishment is substantial and has tremendous scope to improve. This is possible through a proper marketing strategy by conducting various seminars at state and national level and also launching appropriate mode of advertisement and publicity through print and electronic media. The educational institutions of all level are being involved for scientific research to formulize the strategies for efficient propagation and tourism.

2.3.9.7 Constraints

- Lack of professionals to run this establishment.
- Inadequate infrastructure and facilities to display the other attractive species such as moths and Western ghats species of insects.
- Lack of qualified man power to involve in propagation and management.
- Lack of involvement of Universities and other scientific institutions in managing the Park.
- Lack of efficient marketing.



2.3.10 VETERINARY SECTION

The Bannerghatta Biological Park has a fairly better developed hospital which caters the needs of health care and management of animals housed in Bannerghatta Zoo, Bannerghatta Safari and Bannerghatta Rescue Center. The veterinary hospital is located within the zoo premises having an independent building constructed during the year 2002. Although, National Zoo Policy, 1998 stipulates for the establishment of high standard veterinary care facilities in the zoo, a modest beginning was made during 2004 to have a dedicated and well equipped veterinary hospital complex for the benefit of inmate animals. Thus a moderate building with fairly modern facility has been constructed as zoo veterinary hospital within the zoo premises.

In addition to the zoo veterinary hospital, there are 2 veterinary clinics



Present zoo hospital

independently managed by veterinary officers established one each at Rescue Centre and Safari. Both the veterinary clinics are having sufficiently spacious and independent buildings. The veterinary officer's attached to these clinics functions from their respective places and their services are exclusively made available for the animals housed at Rescue Center and Safari respectively. The facilities such as storage for emergency medicines and surgical instruments are also kept in these clinics.

2.3.10.1 Facilities

The hospital has the following facilities to meet the requirements of health care management of captive animals housed in Bannerghatta Zoo, Bannerghatta Safari and Bannerghatta Rescue Centre.

2.3.10.1.1 Operation theater

The zoo hospital equipped with a well designed and spacious air conditioned Operation theatre to address any surgical intervention on captive animals. Most of the operations involving hernia, vasectomy, amputation are regularly done in this operation theater. More commonly the treatment on tear wounds, abdominal injuries and fractures, spinal decompression occurred due to infighting are attended by virtue of the existence of this facility.



2.3.10.1.2 Transit pharmacy

The zoo doesn't have a licensed pharmacy in the zoo hospital complex. However, a facility for procuring the commonly used emergency drugs is being done as the traditional practice. All these drugs procured is stored in an exclusive transit pharmacy room and used as and when required. The veterinary medicines are regularly required on 24 hours basis in order to overcome the exigencies in the night and early hours of the day. Most of the infighting take place in the night and the animals fall sick during night are noticed in the early morning of the day. If the emergency drugs are not kept in the hospital store, it is very difficult to overcome the situation in supplementing required drugs, as most of the general pharmacies opens after **9.00 AM**. Therefore, crucial veterinary medicines like

anti-venom, anti-biotic, anti-histamines, analgesics, vaccines, nutrient supplements, few important general medicines, surgical material and appliances are procured in advance and kept always in readiness in the zoo hospital.

2.3.10.1.3 Radiological facility

The zoo hospital is equipped with radiography instrument. The commonly noticed problems in captive setup, occurs due to infighting trauma like fractures, dislocations and other general complaints like dental problems, choke and intestinal obstructions are well detected due to the presence of radiological facilities in the zoo.

2.3.10.1.4 Incubatory facilities

The zoo hospital is having a dedicated incubatory facility for **neo-natal** care and management. There is also facility for egg incubation. Most of the bird species such as pheasants, ducks, fowls, and peacocks eggs are artificially incubated to have better hatch and survival.

2.3.10.1.5 CCTV unit

The zoo hospital has the facility of day and night vision cameras with continuous recording and display unit. This CCTV setup is mobile and regularly maintained. Wherever and whenever it is required is used for recording the information round the clock regarding the animal behaviour during parturition, lactation and parental care. This system is very regularly used in **lion, tiger and leopard** enclosures.

2.3.10.1.6 Inpatient treatment wards

The zoo hospital has an exclusive inpatient ward attached to the hospital in the backyard. It is the unit with 8 room facility built during 2011-12. This needs the up-gradation as water, power and other facilities are to be still provided.

2.3.10.1.7 Animal nursery

It is a facility for caring and nursing the small animals, and created just behind zoo hospital during 2012. The young ones of herbivore, carnivore, birds and reptiles rescued from the refused parents within the park and from wild are brought and housed here for intensive care, management and treatment. All the orphaned young ones are hand reared with special feeding formula by trained nursing keepers. Infant incubator facility is also available in the zoo hospital to ensure thermo regulation required to premature, still born, and weak ones.

2.3.10.1.8 Wild Animal Diseased Diagnostic Laboratory (WADDL)

The hospital unit also has a sophisticated Disease Diagnostic Laboratory established within the zoo premises in an independent building. This laboratory is an outcome of a collaborative effort between Bannerghatta Biological Park and Institute of Animal Health and Veterinary Biological (IAH&VB), Hebbal, Bengaluru. The infrastructure and the animal samples required for the examination are to be made available by the BBP. The IAH&VB, Hebbal lends its expertise for a specialized service in investigation and diagnosing the disease. It is by virtue of the existence of Wild Animal Disease Diagnostic Laboratory in the premises of Bannerghatta zoo, all the captive animals housed in Bannerghatta Zoo, Bannerghatta Safari and Bannerghatta Rescue Centre are exposed for regular and periodical investigations. The samples such as **urine, stool, sputum, saliva, blood, serum** and other required specimens are collected from the inmate animals and dead carcass to investigate into the general status of **health, cause of disease, cause of death** etc. Based on the periodical results obtained through clinical tests and expert opinion the diseases are prevented, treated, monitored, controlled and eradicated. This happens based on the strategy worked out and the line of treatment adopted involving the clinical and biological experts in the process.

2.3.10.1.9 Documentation facility

The zoo hospital is provided with a dedicated computer and its infrastructure to record and document the various information required from the point of efficient management. All the informations related to health care management of inmate animals are recorded in the format prescribed like **animal stock register, animal history sheet, diet chart, treatment register, daily report, postmortem reports** and **studbook information** of endangered species. There is an exclusive computer operator provided for this purpose.

2.3.10.1.10 Postmortem facilities

The BBP hospital also has the facility for conducting the postmortem of dead animals of Bannerghatta Zoo, Bannerghatta Safari and Bannerghatta Rescue Centre. This facility is situated away from the zoo and rescue centre in an isolated area. Facilities such as good lighting, ventilation and examination platform are created. There is no incinerator facility in the park presently and therefore the animal bodies are either burnt or buried.

2.3.10.2 Staff

The supporting staff strength to the BBP hospital is fairly good due to initiatives made by Zoo Authority of Karnataka to provide the minimum staff to the zoo hospital. The Zoo authority of Karnataka while approving the Cadre and Recruitment Rules have sanctioned the post of Deputy Director (Animal Husbandry and Veterinary Service) to head the zoo hospital. Accordingly by pending approval for the Cadre and Recruitment Rule of ZAK, the post of Deputy Director (Animal Husbandry and Veterinary Service) was sanctioned by government of Karnataka for a period of one year. Accordingly the department of animal husbandry and Veterinary service have posted an officer of the Rank Deputy Director (Animal Husbandry and Veterinary Service) and who was the head of the hospital for one year and presently the said post is awaited for renewal by the government.

There is an officer of the Rank of Assistant Director (Animal Husbandry and Veterinary Service) who is presently heading the BBP hospital in the absence of Deputy Director (Animal Husbandry and Veterinary Service). There are 03 veterinary officers working one each at Zoo hospital, Safari Clinic and Rescue Center Clinic. The WADDL is supported by an independent veterinary pathologist who is of the Rank of Scientist in the department of IAH&VB. The salary and the perks of the post of veterinary pathologist and lab technician is being given by the Institute of Animal Husbandry and Veterinary Biologicals. There are five animal keepers attached to BBP hospital who assists the doctors in the hospital duty and also nursing the young ones, orphans, sick, injured and operated animals.

Statement of hospital staff working in BBP hospital

Sl. No.	Category Posts	BBP ZOO	BBP Safari	BBP Rescue Centre	BBP Hospital
1	Deputy Director (AH & VS)				Vacant
2	Asst. Director (AH & VS)	1			1
3	Veterinary Officer	1	1	1	3
4	Veterinary pathologist*				1

	Lab Technician*				1
5	Veterinary Lab Assistant				2
6	Computer Operator				1
7	Attender (peon)				1
8	Assistant Animal Keeper				5
Total					15

*Under the pay roll of IAH&VB

2.3.10.3 Duties and responsibilities

The BBP hospital is working on a collective responsibility under the leadership of Deputy Director (AH&VS) and in his absence Assistant Director (AH&VS) who heads the hospital. The following are important duties and responsibilities of the Zoo doctor and supporting staff.

- Prophylactic treatments to all the inmate animals in the form of annual or periodical vaccination against possible viral and bacterial diseases.
- Intensive observation on every individual animals for their general health, hygiene and other associated veterinary care
- Certify the feed and fodder to ensure the good quality and fixed quantity and also timely supply to all the inmate animals including sick animals.
- Periodical supplementation of vitamins, mineral nutrients and essential amino acids to promote the good health.
- Annual census of all the animals housed in the zoo (mammals, birds and reptiles) to prepare the annual animal inventory.
- Undertake timely surgical intervention to treat sick, injured, pregnant animals housed in the zoo, safari and rescue centre.
- Chemical restraining of animals with the permission from, the Executive Director for treatment, shifting and translocation purpose.
- Adopt population control of prolific breeding animals such as deers and few species of birds.
- Hand rearing the rescued, rejected young ones.

- Documentation of all the data generated in the hospital due to observations, treatment, surgery, feeding etc., to prepare various reports to be submitted to competent authorities.
- Involving the zoo education, internship programmes designed for youths, students and trainees from the veterinary and other general back ground
- To maintain the studbook information
- Systematic report of all the events on day to day basis to the Executive Director and also to control the information monitoring system of the BBP hospital and veterinary clinics of safari and rescue centre.

2.3.10.4 Constraints

The scientific approach in the zoo management demands every zoo for implementing the wildlife health and quarantine rules and regulations as per the National Zoo Policy 1998. It is also mandated in the said policy to appropriate vaccination programmes to safe guard against infectious disease and also to isolate the infected animals from the zoo population before spreading the disease. Although, every possible care is taken to ensure the good health of all the inmate animals. Some of the constraints prevails in the health care management system. Accordingly the Bannerghatta Biological Park hospital also has some constraints which are listed below.

- **Absence of quarantine facility**
The Bannerghatta zoo hospital is of around 12 year old and serving for the cause of inmate animals since from the establishment. To enrich the animal collection and also to reduce the over population, animal exchange programme has been taken up very regularly. As per the stipulations of the Central Zoo Authority, the animals involved in the shipment need to be exposed for the quarantine observations. Although, Bannerghatta Biological Park involved in exchange and shifting animals, no efforts were made to establish a quarantine facility. Therefore, there is an immediate need to establish a quarantine facility in a isolated area within the park.
- **Absence of incinerator**
There is no facility for burning the dead carcass and bio-medical waste generated in the BBP Hospital. Therefore, there is a immediate need for

establishing the incinerator for burning the dead carcass and other biomedical waste generated in the Zoo hospital.

- **Absence of Animal Ambulance**

The BBP hospital being a central authority to control and monitor the animals in zoo, safari and rescue centre units, needs a dedicated ambulance for attending emergencies and also to shift the sick and injured animals to the veterinary hospital or to veterinary college at Hebbal for higher treatment.

- **Lack of hand rearing facility**

There is no dedicated unit with basic facilities to hand rear the orphan and refused animals.

- **Lack of advanced technology and important equipments**

The operation theater lacks the basic facilities such as preparation room, also certain important equipments such as endoscopy, ultra sound, ECG and anesthetic machines.

- **Inadequate facilities in inpatient ward**

In the existing inpatient ward there is no treatment area and the rooms to accommodate sick animals are not provided with basic facilities such as squeeze cage, water supply, sanitation etc. The inpatient wards are not designed for different species such as bigger mammals and cats.

- **Lack of facilities for clinical research in the zoo hospital**

Presently the zoo hospital doesn't have clinical facilities to undertake any research subject which are having the field applicability value. There is need to provide facilities such as laboratory, animal samples, laboratory chemicals etc., to undertake important research topics involving day to day management issues.

- **Absence of reference library**

There is no reference library facilities within the zoo. Acquiring periodicals, journals, books, research papers and any other booklets of scientific value is the need of the day to widen the working scope and knowledge. Therefore, most of the time the zoo veterinarians, will treat the animals based on the traditional knowledge they acquired over experience than the scientific knowledge generated through valid experiments and field studies by the global scientific community.

2.3.11 COMMISSARY (STORE, FEED AND FODDER) SECTION

Feeding the right quality of food, which is nearer to their natural food both in quality and quantity to each individual animal, will keep the animal in their natural health. Well fed animals with hygienic food and water would develop the required resistance power to overcome all the diseases and any climatic adverses apart from resisting the psychological stress due to confinement. **The National Zoo Policy 1998, Stipulates that, every zoo shall provide diet to each species, which is similar to its feed in nature.** Further for well being of the animals, supply of potable water shall be made available to all animals kept in the zoo round the clock. The store, supply of feed and fodder and the distribution of the same to the inmate animals in right quality and quantity is presently under the control of the Range forest officer, Zoo Range.

The Bannerghatta Biological Park is 42 year old institution involved in management of animals. Although, 42 years are completed the procurement and distribution of feed and fodder to the animals were not standardized till recently. It was only, during 2011-12 for the first time, the concept of food storage was conceived and accordingly a dedicated building with infrastructure was created to store the food articles and miscellaneous materials. The food articles which are not immediately perishable like cereals, grains, wheat bran, Jaggry, coconut etc., are being procured and stored for a month time. The perishable food articles such as green fodder, green grass, fish, beef etc., are being procured on a day to day basis through monthly indent.

2.3.11.1 Procurement and storage

The dedicated infrastructure created to store the food articles on a monthly based procurement has improved the standard of procurement and supply to the animals. All the consumable supplies including perishable and non-perishable articles required for zoo, safari, rescue center and Butterfly Park are procured through tender system from qualified contractor. The articles are always procured on indent basis prepared by the different unit officers. Each unit officer has to prepare the details of food articles and other consumable requirement for the month and accordingly the indent for the month is worked out and submitted to the Executive Director. All the indents from different unit officers are clubbed into one **comprehensive monthly indent** and supply orders are placed to the tender contractors. The non perishable

food articles like grains, cereals, wheat bran, oat, jaggary, coconut, oil, etc., are procured in bulk for the entire month and stored. The receipt of all the materials as per the indent is accounted in the stock register and distributed to each of the animal enclosures based on the diet chart in an exclusive container.

The daily consumable food articles such as leaves, fruits, vegetables, tubers are cleanly washed and chopped in the zoo kitchen and distribute to the animals in the containers fixed for each house. The other daily consumables such as leaves, green grass and branch fodder are weighed and measured to ascertain the quantity and distributed to the animal enclosures depending upon the diet chart.

2.3.11.2 Duties and Responsibilities

The range forest officer Bannerghatta Zoo range is the overall in-charge of store section. The indent, supply, storage and daily distribution is closely monitored by store keeper who is working under the range forest officer, Bannerghatta zoo range. The food articles such procured on a monthly indent basis on receipt at store by the store keeper is exposed for cleaning to ascertain hygienics and adulteration if any. The cleaned food articles, other consumables such as jaggary, coconut, dry foods etc., are stored till the month in a barrel, containers and other inbuilt storage facilities.

The store is guaranteed with rodent proof facilities and hence the entry of rodent and bandicoots is prevented in to the storage. “The Deputy Director, Animal Husbandry and Veterinary Service in charge of BBP hospital is duty bound to visit the store around 9.00AM on every day and checks the quality and edible fitness of the food articles prepared in the storage for distribution to the animals. After the quality and edible fitness test of all food articles is done , the zoo veterinarian will certify and give clearance to the store in-charge to lift and distribute the food to the animals. No food or any food articles are given to the captive animals without the clearance from zoo veterinarian”.

BBP store unit is provided with a mini transport vehicle and two store assistants to distribute the feed and fodder to all the animals in the zoo, safari and rescue center. The Deputy Range forest officer in charge of zoo, safari and rescue center will receive the food at site and ascertain the quality and quantity enclosure wise. The animal keepers in-charge of the enclosures will receive the containers

belongs to their enclosures and ascertain the quality and quantity animal wise and in turn distribute to the individual animals in the enclosures.

- The Deputy Director of BBP and the Range forest officer's in-charge of zoo range, safari and rescue centre are duty bound to check the quality and quantity of the food supplied to the animals in the animal enclosures.
- The Executive Director being overall in-charge of the park will inspect the quality and quantity of the food in the store, on transit and in the animal enclosures at his wisdom. He can authorise a qualified agencies to do so on behalf.

2.3.11.3 Zoo Kitchen

The storage section of the Bannerghatta Biological Park is provided with a Petroleum gas connection to kitchen to cook for the animals like elephants, monkeys etc., It was during 2011-12 an exclusive kitchen building was constructed within the storage complex. There was an immediate need for a dedicated zoo kitchen to cook the food, boil the milk and eggs and to prepare the concentrates and clean the green fodder and vegetables in the potassium permanganate ($KMNO_4$) solution. Earlier to the construction of zoo kitchen, the raw food like paddy, rice and other cereals were directly given to the bigger animals like elephants, bears, monkeys etc., The newly established zoo kitchen is serving efficiently by way of ensuring good quality, cooked food and concentrates to the captive animals.

2.3.11.4 Feed Schedule and Diet Chart

It is in order to ensure the proper supply of feed and fodder to all the captive animals housed in the zoo, safari and rescue center, the distribution strategy has been worked. The feed schedule has been conveniently divided into two, as **forenoon feed** schedule, between **10.00 AM to 12.00 PM** and **afternoon feed** schedule, between **3.30 PM to 4.30 PM**.

All herbivore, fruitivore and omnivore animals are brought under the “forenoon feed schedule”. The large herbivores like elephants, hippopotamus, bears and other animals fed with large quantity of food, food concentrates and green grass are given due priority because the large quantity of grass supplied to these animals need to be ensured for quality and quantity which is possible only during the early hours of the day. If any rejections, the contractor will have time to supply the alternate food till evening. Further, these animals would take longer time to consume the grass given so that the proper supervision and observation of each

animal is made to ascertain, whether the fodder is fully eaten or refusal if any. Most of the fruit eating, grain eating and special diet animals (fed with bread, milk and egg etc.) are also given food during the day time. Therefore, all the herbivores animals are fed during the day time in the morning session.

All the carnivore animals are brought under the “afternoon feed schedule” and they are given food during the afternoon only. The animals of cat and dog families such as, leopards, lions, tigers, wild dog, wolf and jackals are the meat eating animals housed in the zoo. The process of slaughtering of prey animals and transporting the meat to the BBP and onwards to the feeding site will take sufficient time and the process of converting the carcass into pieces and certifying the quality by the doctors will take further more time during the day. Therefore, it is felt convenient to feed all the carnivore animal during afternoon period.

The diet chart has been worked out considering the age, sex, size and other behavioural biology of animals and put in to practice since a decade. The seasonal variation factors are taken into consideration to revise the diet chart of certain animals during some seasons. A day fasting is observed presently on Tuesday in a week for all the captive animals housed in the zoo, safari and rescue center except sick, old and delivered and pregnant animals.

2.3.11.5 Constraints

2.3.11.5.1 Absence of Weigh Bridge to weigh large quantity of feed and fodder such as grass, grains etc

The green fodder such as green grass, branch fodder, sugar cane and food articles such as grains, cereals, bran and oats are purchased in a bulk quantity for day to day supply and also for monthly supply. There is no computer weighing machine installed within the zoo premises and even at the storage complex. In the absence of this facility the large quantum of feed and fodder articles are approximately weighed on a small weighing machine and some time on ocular basis whenever the supervisory level officer are not there. This not only leads to ambiguity and scope for under or over feeding, which will have severe impact on animal health.

2.3.11.5.2 Absence of deep freezer facility to store the emergency food material

The emergency situation arises whenever there is a bundh, strike or transportation failures, the transportation of the food articles on day to day supply gets

affected. More particularly, the sick animals, young ones, lactating mothers and old animals are severely affected. Therefore, the emergency food needs to be stored in the deep freezer facility to overcome the situation.

2.3.11.5.3 Inadequate space in the existing storage facilities

The store facility created within the zoo premises of Bannerghatta Zoo also takes the additional burden of storing the feed and fodder pertains to Bannerghatta safari and Bannerghatta rescue center animals. Further, the storage of large quantity of fodder like hay, paddy straw needs spacious yard which is not there presently in the existing store facilities. Therefore, there is a need to create exclusive store facilities for each of the unit such as zoo, safari and rescue centre or have a common store facility in a comprehensive manner with a spacious building and yard.

2.3.11.5.4 Lack of hi-tech kitchen facilities for preparation of large quantity of food

Although, the existing kitchen is manageable to prepare food and food concentrates in a smaller quantity, it is not able to accommodate the growing demand of preparing large quantity of concentrates and huge quantity of cooking. Therefore, the kitchen needs to be upgraded with modern facilities for cooking large quantity of food and preparing the large quantity of food concentrates and fruits and vegetable concentrates.

2.3.11.5.5 Lack of feeding troughs to every enclosures

There is no system of delivery of fruits, vegetables, cooked food, meat, fish etc., through an identified container to each animal enclosures. In order to ensure the right quality, quantity and hygienic food to the animals every animal house has to be provided with identified food container. Therefore, there has to be a valid system of food packing and delivery to each animal house in the identified food containers.

2.3.11.5.6 Lack of emergency supply system

Whenever there is a social problem leading to strike, bundh etc., the tender contractors fail to supply the feed and fodder. Although, tender conditions mandates on the contractor to make the suitable alternative arrangement, it hardly happens in reality. Therefore, there has to be a system of direct procurement from the government suppliers and agencies with a liberty to executive director to exercise extra powers to purchase and procure during such exigencies.

2.3.12 SANITARY SECTION

Sanitation and maintenance of hygienics indeed leads to a good management of Zoo, because the health of the captive animals is directly depends on the cleanliness of enclosures. Therefore, every zoo needs to be meaningfully planned for proper drainage for the disposal of semi-solid and liquid wastes generated from the enclosure on day today basis. Maintenance of a better sanitation is an integral part of animal upkeep and management. The National Zoo Policy 1998, stipulates that every animal in the captive setup be provided with better housing and good drainage. Regular disposal of solid and liquid waste from the animal houses is must, on day to day basis. Any failure in this endeavor leads to stagnation and unhygienic conditions which ultimately be a threat of many diseases in the zoo scenario.

2.3.12.1 Sanitation in Bannerghatta Zoo

As already explained this biological park started as a “picnic corner” and later on turned to a Zoo, did not have any plan to create sanitary system in the area. Further as the additional enclosures were added year by year, the sense of providing efficient and effective sanitary system did not occur in the mind of earlier managers. The enclosures were swept on day to day basis and the accumulated debris were heaped at a corner and at an interval of once or twice in a week the heap of debris were either carried on head load or by cart to the garbage yard created in the corner of the Zoo.

As far as the water used for cleaning the animal enclosure used to be swept into small pits created for the purpose within the animal enclosures. The cleaned water from some of the aquatic enclosures such as aquatic bird enclosures, hippopotamus enclosures used to be let into the open drain and ultimately the same used to be impounded in the open tank within the Zoo. The solid waste accumulated in the enclosures of large mammals such as Elephants, Hippopotamus, and Dears used to be manually collected and carted to the garbage yard located within the zoo on day to day basis. Further the garbage collected out of floor sweeping on the internal roads and open drains and also in the premises of parlors and petty shops within the Zoo also used to be collected on a day to day basis and shifted to garbage pit. When the Zoo closed on weekly holiday the litter used to get accumulated and the environment around the enclosure will be polluted as a result the next working day will have work pressure on the sanitary staff. At the end of the year or whenever

the situation demanded the accumulated garbage is disposed on a tender to the public as manure.

The practice of salvaging the garbage within the Zoo was continued till 2011 and 2012 as explained above. The gradual expansion of Zoo has paved the way for accumulation of huge amount of litter, plastics, bio-wastes and garbage. It was estimated that on an average **half ton** and on weekly holidays **one ton** of litter is accumulated and the sanitary staff is finding it difficult to salvage from place to place on a day to day basis. Therefore, a tractor was purchased during the year 2011-12 and put into service of sanitary activities.

There are four number of toilet complexes established in the Zoo for the benefit of the visiting tourists. These toilet complexes are serviced and monitored by a service organization called **Sulabh Internationals Ltd.** The usage of these facilities by visiting tourists is on payment basis which guarantees the efficient management in maintaining the cleanliness and hygienics. The solid and liquid wastes collected in these toilet complexes on day to day basis is drained into the open pits created for the purpose. There is no mechanism to salvage this **bio-waste** in a better manner due to lack of underground drainage (UGD) System. It is noticed quite often that, these pits get filled very frequently and the bio-wastes spill out the pits causing pollution. This situation of unhygienic will also pose a threat of spreading diseases to sensitive animals such as birds and mammals. The Zoo management involves in cleaning these accumulated bio-wastes manually and shifts out of the Zoo premises. The manually cleaned liquid wastes will flow downward and leads to Kaval kere and pollute, as there is no system of affluent treatment plant in the Zoo. Therefore, there is an urgent need for the establishment of definite mechanism of solid and liquid disposal

2.3.12.1.1 Disposal of Solid wastes

The accumulation of solid wastes within the Zoo in the form of animal excreta, dung, litter and plastics is dumped in a garbage yard as explained earlier within the zoo premises. The Bio-degradable solid waste generated within the zoo is segregated at the source to convert as vermi-compost. Although, enough quantity of vermi-compost was manufactured on day to day basis the project could not sustain due to failure in the marketing strategy. The non-biodegradable wastes such as plastics, glasses and construction wastes etc are collected on day to day basis and shifted out of the Zoo premises.

2.3.12.1.2 Disposal of Liquid wastes

Bannerghatta zoo do not have any **UGD** system to dispose-off the liquid waste within the zoo premises. However the traditional open drain network created over the years is serving as storm water drain and also for carrying the liquid wastes generated from the animal houses such as Hippopotamus, Crocodile, Aquatic aviary etc,. The water collected in this catchment right from parking area, new zoo area, old zoo area leads to Kavalkere. The storm water coming from Benakanakere along with the waste water coming into it through subsidiary drains exists in the zoo also drains into Kavalkere located in the downhill side within the zoo premises. The contaminated water such drained into Kavalkere pollutes the impounded water as there is no facility of affluent treatment established at the uphill side. Therefore there is an urgent need to establish an efficient ETP in the zoo.

2.3.12.2 Sanitation in Bannerghatta Safari

The various units of Bannerghatta Safari are located in a distance of 1.5 KM to 5 KM from Bannerghatta Zoo. There are 04 major safari units located within a distance of 02 to 03 KM between them. All these units are exclusive to each other. Each Safari unit is integrated with animal housing complex and open forest area enclosed for free movement of animals. The following are the housing complexes constructed to provide animal houses.

A. Tiger Safari

i. Indira Gandhi Tiger Safari

Indira Gandhi tiger safari housing complex has 03 different units having 11 independent animal holding rooms. All These 03 units do not have a common drainage for letting out the waste water. Further there is no facility for disposal of animal excreta. The available existing drainage facility is connected to soak pits.

ii. Appaiah Tiger Safari

This animal housing complex has 02 independent units having the facility of 10 animal holding rooms. The liquid waste water generated by washing these cages is pushed into soak pits through small drains provided within the animal housing complex.

iii. White Tiger

White tiger housing complex has 02 independent units having the facility of 08 animal holding rooms. The waste water disposal and the animal excreta is done through the small drain linked to independent soak pits constructed for each of the unit.

B. Lion Safari

The housing complex constructed for lion safari has 11 holding rooms. This unit is located in low laying area and the waste water along with animal excreta is pushed out of the housing complex into the open area. The waste water such collected creates un-hygienic water logging in the animal house. This becomes source for the growth and multiplication of pathogens and risk of spreading the diseases.

C. Bear Safari

The bear safari area spreads over 20.00 Ha. There are 05 independent animal housing complex constructed namely Panchavati, Chitrakuta, Kishkinda, Dr. G.K.V Block and Jambava. Out of the 05 housing complex 02 are (Dr. G.K.V Block, Jambava Block) are built by the service NGO namely Wildlife SOS and rest were constructed by the Forest department earlier. All these housing complexes do not have UGD line and the sewerage water generated by washing animal enclosures are drained into the pits dug for the purpose.

There is one more animal housing complex built adjoining to bear safari area was managed by an abroad NGO namely Born Free Foundation. This unit also does not have UGD system. The sewage water is pushed into pit.

2.3.12.3 Sanitation in Rescue and Rehabilitation Center

The Rescue and rehabilitation center managed by BBP and constructed with the financial support of Central Zoo Authority spreads in around 17.50 Ha. This Rescue Centre has 02 housing complexes namely,

i. Lion Block – (L Block)

The lion block has 12 independent animal housing units. Each of this unit has 06 animal holding rooms totaling into 72 animal holding rooms in the entire lion block. For the convenient of sanitary management 03 to 04 animal houses are linked with common UGD connection and finally drained into soak pit. Accordingly the UGD linkage is made between animal house L1 to L4, L5 to L9 and L10- L12 by providing 03 independent soak pits.

ii. Tiger Block (T Block)

As in the case of lion block the UGD system also established in the tiger block. The tiger block has 05 animal housing units and each of the unit has 06 animal holding rooms totaling to 30 animal holding rooms. Presently rescued tigers and leopards from the field and retired tigers from the safari are housed in this block. The sewerage water and animal excreta from house no. T1 to T5 is drained into a common pit located at T3 house. Removal of night soil from these pits and sanitizing them periodically done as a part of sanitary activity carried out on regular basis.

iii. Meat room

There are 02 meat rooms constructed in the rescue centre premises for slicing, chopping and cutting the beef and mutton to be fed for the animals housed in the different units of BBP. As per the tender stipulation, the tender contractor has a binding to supply the skinned and cleaned body parts up to knee joints of both fore limbs and hind limbs. Such body parts are to be chopped into eatable size and provide to the animal. While doing so, lot of biomass get accumulated and the water used for cleaning the meat also to be drained out of the meat room. This waste is also collected manually and shifted out of the rescue centre premises to dump in the bone pit which is located away from the rescue centre.

iv. Bone pit

The leftover food such as uneaten meat, bone etc., collected on a daily basis from every animal house in the zoo, safari, and rescue centre. Such collected uneaten leftover are transported through mini truck kept for this purpose and dumped in the bone pit. The bone pit constructed for the purpose is located far away from the zoo, safari and rescue centre is fully covered on top with iron structure to prevent the visit of scavenging birds like crows, kites, eagles and vultures etc. The salvaged flesh and bone is left in the pit for a month to decompose and the bone remained in the pit is removed by the tender contractor on periodical rotation. After every removal, the pit is sanitized by using disinfectants.

2.3.12.4 Sanitation in Butterfly Park

Bannerghatta Butterfly Park spreads in open forest area. The main garden area has a big dome with a water body, which is artificially built to impound the water in order to facilitate for the natural life of butterflies within the dome. The water body

needs to be cleaned at least once a week to ensure the hygienic. The waste and contaminated water due to cleaning the tank is drained into the existing small underground drainage and ultimately led to the tank located in the main garden. After every cleaning the water body is sanitized with disinfected.

There is a Sulabh Souchalaya complex built for the benefit of visiting tourists. This toilet complex has the urinal and latrines. The solid waste and sewerage water of this toilet is drained into a soak pit built which is periodically cleaned and sanitized.

The litter accumulated in the butterfly garden area due to visiting tourists is regularly collected on a daily basis and transported out of the premises to the common dumping yard.

2.3.12.5 Sanitary issues in the hotel and restaurant

There is hotel namely **Mayura** run by KSTDC and **Hill View Restaurant** run by Jungle Lodges and Resort and **Nature Camp** establishment run by the Jungle Lodges within the Herbivore Safari. All these establishments carry out their business round the year except on the days park is closed. Thousands of tourists visit to these places and cause to generate huge quantity of litter. The toilet units located within these establishments are not linked to any underground drainage system, hence the solid and liquid waste of these toilet unit drained into soak pits created for the purpose. Regular removal of night soil and other waste generated out of these establishments are monitored by KSTDC and Jungle Lodges & Resorts authorities under the instructions of BBP.

2.3.12.6 Constraints

- Lack of Underground drainage (UGD) system
- Inadequate water supply
- Absence of effluent treatment plant (ETP)
- Lack of Disposal system of garbage
- Inadequate manpower

2.3.13 SECURITY SECTION

Zoo management authority should have utmost concern for the safety and security of both captive animals and visitors. At present security system is provided by the private **security agency** through **tender contract**. Inadequacy is felt in the present system of security arrangement and some more security personnel need to be provided to Safari, Butterfly Park and Bannerghatta Rescue Centre, preferably **ex-service men** with **licensed weapons**. It is surprised to mention here, that till 2010-11 the security was limited to provide watch and ward to the entry gates rather than assuring over all protection to the park properties, inmate animals and the visiting tourists. Further, several hundred crores worth of park property is lying open at the mercy of visiting tourists and other ant-social elements.

- **Illegal activities**

The boundary of the park was porous and large number of anti-social elements from the local villages, Byrappanahally, Sampigehally and Bannerghatta were entering into the park, where ever they like and merry around the open forests carelessly. Most of the youths from these villages were in the habit of tress pass into the park round the clock with crates of liquor and drink at their leisure. Large number of gamblers was regularly visiting the area illegally and gamble under the big banyan tree behind butterfly park host garden, during day and even at night with petro light. It was a paradise for unruly youths, who would always come with their mate and stray into the bushes in the jungle.

Large number of village cattle were let into the park for grazing by the local villagers every day. Local villagers were visiting these forests for the collection of fodder, fire wood, small timber and other forest produces. The total dependency on these forests by local villagers was very high and therefore, there was tremendous pressure on these forests. All the activities as explained above were happening every day desperately and uncontrollably as there was no effective security system in place.

The entrance plaza was opened during 2012, the new safari gate was put into operations and other many activities launched during 2012 demanded for the improvement of existing security system and this was done by installing new and effective security system in place.

- **New security system**

It was during 2012-13 all the possible steps were taken to strengthen and institute a security system. As a result the security personal were increased from few countable to 40 numbers with the approval of Governing Council of ZAK and new security system was commissioned. The retired Police personal of the rank of SP as security head and inspector rank as security officer were engaged along with young security personal from security agency, were deployed for day and night duty. The new face lift was given to the security system and their morale got boosted and the effective security system in place.

It is ut-most important in the light of the judgments passed in the Hon'ble Courts in the following cases,

In the *Nitia Walia* case, the Delhi High Court held, "It is well settled law that it is their bounded duty to ensure that wild animals in the zoo are kept and confined in such a manner that they are incapable of causing damage or injury to the visitors to the zoo".¹

In *Naveen Raheja* case, the Supreme Court by its order dated 20.11.2000 stated, "In the wake of death and killing of the tigress an unprecedented incidence in the history of zoo management at the Nehru Zoological Park, Hyderabad, directions have been issued to beef up security arrangements around tiger and leopard enclosures in the zoo".²

2.3.13.1 Duties and responsibilities

Bannerghatta Biological Park is blessed to have vast extent of land with forest and natural wildlife. In addition to the buildings the infrastructure created over the years is to the tune of several hundred crore. In addition hundreds of invaluable animals are there in the collection. Protecting this huge infrastructure and ensuring the safety and security to inmate animals is the bounden duty of the park management authorities and this is possible only if an effective and intelligent security system is established.

The average visitation to the Bannerghatta biological park is invariably between 04 to 05 thousand visitors per day. On weekends and holidays the Zoo has

¹ *Nitia Walia vs Union of India*, AIR 2001 Del 140

² *Naveen M Raheja vs. Union of India and Ors*, WP (C) No 47 of 1998 (Supreme Court) Order dated 20.11.2000

the record of 18 to 20 thousand visitors in a day. The statistics reveals that on an average 12.5 to 13 lakh people visit this park annually. This situation calls for an effective and efficient security arrangement round the clock and round the year. Following are most important duties and responsibilities been carried by the security personnel deployed in the park.

- Checking at entrance gate and regulation of general entry into the park
- Regulation of visiting crowd at the visitors entrance gate
- General Perambulation in the different units of the park.
- Watch and ward at the new entrance plaza.
- Crowd monitoring at Safari entry.
- Watch and ward at all entries and exits within the Zoo premises including parking area.
- Regulation of parking vehicles entry and exits.
- Night watch and ward within the Zoo premises.
- General protection against likely theft, robbery and other anti-social activities within the Zoo premises.

2.3.13.2 Staff

The security wing of the park is headed by a security officer and assisted by security supervisors and security guards. The following is the details of the staff strength.

1. Security Officers - 02 members
2. Security Supervisors - 03 members
3. Security Guards - 20 members

The security services are taken on contract basis through tender.

2.3.13.3 Departmental Security

It is to support the security agencies the department is also deploying its personnel for management of security during night and also few in the day. Normally the officials from the zoo, are forest watchers, forest guards and even zoo staff are deployed for this job. Following are the number of zoo staff working for the night security.

1. Zoo security- 4 members.
2. Safari security- 6 members
3. Securities at Rescue centre -4 members.

In addition to the deployment of staff for the night security, night round is being conducted on day to day basis covering Zoo, Safari and Rescue centre. There is a Night round vehicle along with a driver and its allotted staff to conduct the night patrolling has been ordered. The observation or the findings of the night staff or recorded in the night beat book and submitted to the Executive Director for further action on day to day basis

The staff deployed for the night security conducts the night watch and ward and over see the safety and security of the animals housed. All the officers upto the level of Executive Directors are conducting night patrolling for a day in the week. The government also, has provided arms and ammunition to ensure the adequate safety and security.

2.3.13.4 Details of Weapons

Following are the details of weapons given by the Government to ensure the safety and security of the Zoo and its Property including Zoo animals.

1. Double Barrel Guns – 01 for staff
2. Pump action guns – 06 for officers
3. Pistol - 01 for Executive Director

2.3.13.5 CCTV Surveillance

The Zoo is equipped with CCTV surveillance by installing High Definition cameras and Monitoring system. CCTV cameras are installed at staff entrance gate, visitor's entrance gate, On the top of BMTC bus stand complex building and one at the office entrance. This network is monitored by a central network system with a master control facility installed in the Chamber of the Executive Director. The day to day data record through all these cameras can be stored up to 30 days and exposed for any kind of analysis if need be, as and when the situation demands.

2.3.13.6 Wireless network

The zoo provided with the facility of wireless network. The main station is located at ED office and all the offices and important officials working at different units of BBP such as Zoo, Safari and Rescue Centre are given with wireless walkies.

Mobile telephones

All the officers and important officials working for BBP are provided with cell phones in order to have an efficient communication system and also for the effective security monitoring.

2.3.13.7 Other Modes of Security

The Bannerghatta Zoo is located within the township of Bannerghatta, which has a police station, the police personnel are also deployed during the day to keep a vigil on the happenings. In addition the police beat is conducted during night around the zoo area which also assures the additional security to the zoo and its property.

2.3.13.8 Constraints

- Lack of intelligence gathering
- Lack of high-tech security system with electronic surveillance
- Inadequate security personnel
- Lack of security training

2.3.14 HORTICULTURE SECTION

The Central Zoo Authority (CZA) mandates on every Zoo, Zoological Gardens and Biological parks to have a minimum of 30 % of the area under tree coverage. This stipulation is mainly to ensure that the Zoo shall have good environment to provide natural surroundings to the animals housed apart from providing aesthetic beauty to the landscape. Further the visitors would rest and relax in the good extent of lung space created in the form of lawns, gardens and parks within the Zoo premises.

The total extent of Bannerghatta national park is 731.88 ha out of which more than 50% is natural forest area endeavored with rich wildlife and bio-diversity. The Bannerghatta Zoo also possessing natural tree cover which is part of Bannerghatta Sandal reserve forest. The lofty trees such as terminelia arjuna, pterocarpus intermitted with huge bamboo breaks gives the lush greenness round the year and



also attributes for the unique micro climate within the Zoo.

2.3.14.1 Lawns and Gardens

Existing Zoo is having number of lawns and strip gardens created to facilitate visitors to rest and relax. These lawns and strip gardens are covered with varieties of aesthetic plants, creepers and flower beds to enrich the beauty of the visitor's path. Efforts have been made to create the green coverage within the animal house and its

surrounding to make the whole environment more natural as an enclosure enrichment programme. There are few major gardens created within the Zoo premises namely,

1. Mini Garden
 2. Suvarnamukhi Garden
 3. Butterfly Park Garden
 4. Tree Park
 5. Rock Garden
- Mini Garden, measuring an extent of 0.6 acres near Zoo Store Complex is important area as large number of visiting tourists gather there to relax and enjoy the environment. The facilities such as stone benches and plant shades are created to optimize the utility value of these gardens.
 - Suvarnamukhi Garden, is a newly created garden measuring an extent of 1.3 acre. This garden is located opposite to new entrance plaza, designed and landscape plan developed and executed by Mrs. Shrusthi Landscape Designers, Bangalore. Number of Stone benches are put at appropriate places and walking path paved with good tiles, also created for the visitors movement. A water fountain created at the center of the garden attracts the attention of all the visitors due to its dancing beauty apart from enriching the aesthetic beauty of the surrounding. To attract the children, a play area has been created with sand pit in a corner the garden.



- The Butterfly Park, premises also have a garden to an extent of around 03 Ha. The garden area has a long walking path with cement tiles linking from entry gate to exit. There are 02 pergolas constructed at beautiful locations facing the forest and the water body. There is also a tank within the garden impounds the water for a longer period of the year and enrich the beauty of the place. This park blessed with good garden area with water body becomes a good natural habitat for butterflies. The visitors moving in this garden would see large number of indigenous butterfly species before entering into the main dome.



- Tree Park, the biological park is blessed with vast extent of open area with a scanty growth of natural trees. Large extent of such open area in front of parking has been brought under afforestation over the years to convert into tree park. Thousands of saplings belongs to local species like pongamia, jamun, ficus and other tree species including the bamboos are planted.
- Rock Garden, The geomorphology of the area exhibit the oldest rock formation. The maximum extent of area of the Bannerghatta Zoo is occupied by vast extent of open sheet rock over which nothing can be grown. There is a tremendous scope to convert this open rock area into **rock garden** as large number of visitors gathering here to see and enjoy the scenic beauty of the nature. There is a pergola built on the **Mirza hill** which is of a open sheet rock. On weekends and general holidays huge crowd gathers here throughout the days.

Large extent of area of around 10.00 Ha in the Rescue Centre premises also brought under the afforestation by planting thousands of saplings. The fruit yielding species like mango, jamun and other jungle wood tree species are planted.

2.3.14.2. Fountains

There are two water bodies located within the Zoo premises namely, **Bandekere** and **Kavalkere**. Large number of visitors gather around these two tanks to see and enjoy the beauty of these water bodies. Realizing the aesthetic



importance, these two tanks have been developed. Stone chairs have been put for the rest and relax of the visiting tourists. Walking paths have been created to facilitate for royal walk around these water bodies. Both these tanks are installed with water fountain. On Sundays and holidays thousands of visitors gather around these tanks and enjoy the beauty of these tanks.

2.3.14.3 Staff

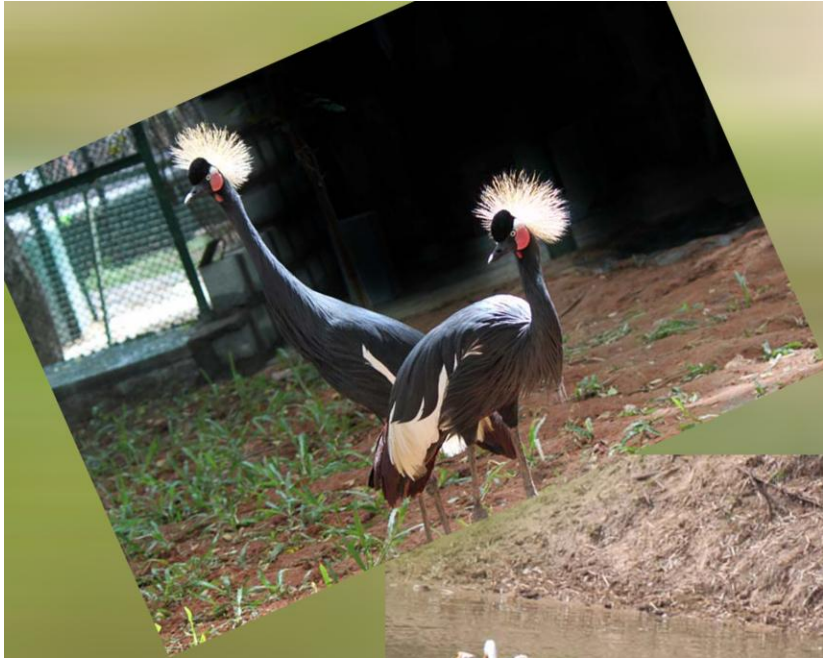
The staff working for the horticulture development is negligible compared to other wings of the BBP. There is no horticulture section as of now and there is no horticulture officer to look after the duties and responsibilities of horticulture activities. The staff working for the horticulture activities like management of lawns,

gardens and parks are the outsourced employees. This aspect of management is carried out more on a traditional manner than the technical.

2.3.14.4 Constraints

- Absence of horticulture section and Officer
- Inadequate supporting staffs
- Lack of landscape planning
- Insufficient of water
- Absence of Horticulture nursery
- Existence of vast extent of open sheet rock







2.3.12 ENGINEERING SECTION (MAINTENANCE SECTION)

It is one of the most important section in the Bannerghatta biological park headed by an Assistant engineer. The important works being carried out by this section are water supply, power supply, civil maintenance works such as buildings, roads, water bodies, enclosures etc. In addition developmental works like construction of building, maintenance of animal enclosures, creation of water bodies and construction of water supply and UGD system is carried out by engineering section.

2.3.15.1 Water Supply

Water is one of the basic requirements for the management of Zoo, Safari and Park. It becomes as a regulating factor whenever the new activities are planned to implement in the Zoo setup. The Bannerghatta Zoo is located at an elevation of about 935m MSL and having rocky terrain with less source of over ground and underground water. The park is not blessed with any perennial river and streams in its vicinity, however large numbers of water bodies have been created over the years in and around the park. The water impounded in these water bodies are normally annual and occasionally biannual when ever followed by a good rainy year. As large number of villages are located adjacent to this park the water in these water bodies used by village cattle and in-habituated free range wildlife. Therefore there is no scope of using the water from these water bodies for the Zoo, safari and Rescue centre.

➤ Tanks

There are few water bodies located within the zoo such as, Benakanakere (adjacent to Veterinary doctors Quarters), Kavalkare and Bandekare located within the zoo premises serve the purpose for a small period of time in the year, as their water impounding capacity is minimum. Previously the water is drawn from these tanks for domestic consumption and maintenance of lawns and gardens. As the demand for water is growing day by day due to various expansion activities in the park, these tanks are not able to cater the need, unless they are improved.

There is a major water body located in a distance of about 05 km from the main Zoo and 01 km from bear Safari namely **Doddannanakere**. It is a huge water

body remains perennial as 02 to 03 major streams carries water to this tank during rainy season. The detailed survey, hydraulic design and estimate has been prepared and submitted to the government for approval. Since the water from this tank is not used for any other purpose such as irrigation, power generation etc, the water remains intact for few years. There is a proposal before the BBP to draw water from this tank by laying a dedicated water supply pipeline.

➤ **Bore wells**

The park has dug 15 number of deep bore wells over the years. The status of the bore wells dug in Bannerghatta Biological Park is stated as below,

Sl.No.	GPS Id	Location	Total Depth (ft)	Casing Depth (ft)	Pump Capacity (HP)	Yield (Lph)	Status
Zoo							
1	BW1	Opp Hill view Res (within prop Giraffe encl)	550		5	-	Abandoned
2	BW2	Behind Ticker Counter	800	80	10	1500	Working
3	BW3	Opp Hipp Enclosure	250		7.5	1000	Working
4	BW4	Near Mayura Resturaunt	250		5	1500	Working
5	BW5	Opp Deer Enclosure	800	80	5	-	Abandoned
6	BW6	Near Hospital	180			-	Abandoned
Butterfly Park							
7	BW7	Near Butterfly park back gate	400		10	2000	Working
8	BW8	Near Butterfly park inside pond	520		10	2000	Working
Rescue Center							
9	BW9	Near L6	440	0		-	Abandoned
10	BW10	Near lion Animal holding house 1	520		10	1500	Working

Safari							
11	BW11	In front of Indira Gandhi Tiger holding	200		5	800	Working
12	BW12	Near IG Tiger house at Old Moole Gundi	550		10	2000	Working
13	BW13	Near Appaiah Tiger holding house	400		Handpump	0	Abandoned
14	BW14	Near White Tiger Holding house	480			0	Abandoned
15	BW15	Near RFO Safari Off, Opp Maramma Temple	280		3	0	Abandoned

Out of the 15 bore wells, only 08 numbers are in working condition and are together yielding approximately around 45000 ltr of water per day. The other bore wells are dead and hence abandoned. The total water requirement from all the 04 units of BBP namely,

1. Zoo
2. Safari
3. Rescue Centre and
4. Butterfly park is enormous.

The water requirement per day is around 2.5 lakh ltrs. The huge gap between the demand and actual supply is met out by importing the water from outside through water tankers. It is estimated that the demand would reach 6 lakh ltr of water per day in coming years as the expansion of Zoo, Rescue center and Safari are contemplated. Therefore it is an immediate necessary to ensure the water supply projects are taken up on top priority. However the Safari unit is comparatively better off than other units as few water bodies located within the herbivorous Safari such as, Chennamannakere, Deepanakere and Gowdanakatte are perennial and can support the demand for the free range safari animals. The bore wells dug in Tiger and Lion Safari are yielding sufficient water to augment.

Although, Bangalore Water Supply and Sewerage board has the Cauveri water supply connection up to Gottigere(BBMP limits), Bannerghatta does not have the

connection. The Cauveri water Supply scheme can provide required quantum of water once it reaches the Bannerghatta township.

2.3.15.2 Power Supply

The Park has dedicated power line to supply the power on regular basis round the clock. It was during 2011- 2012 on the request of park authorities the BESCO has laid the power transmission line within the zoo premises with dedicated transformers at their cost. Since then there is no power scarcity within the zoo. The power requirement in the zoo is for multi-various purpose like, ticket counter , zoo hospital, zoo cafeteria, zoo water supply and zoo office. Although there is a regular power supply, during power cut or at the time of single phase power, the alternate power is outsourced.

➤ Wind Power and Solar Hybrid Power

To manage the power crisis the park authorities have outsourced the supporters to help. Accordingly one of the environmental, eco-friendly power producing entrepreneur namely **M/s E-Hand's Energy Private Ltd**, Chennai have come forward to support in a big way. They have established a mini wind turbine along with solar power at the new entrance plaza to supplement the power to the Ticket issuing counter mainly. It is a mini power plant of 3.5 KVA costing around 13.00 lakh rupees has been generating the green power and installed in the zoo premises at free of cost for the cause of conservation.

The Range Forest Office, Safari Range also been provided with solar power for the efficient working and the solar street lights are also erected at important point in the Safari, Rescue Centre, Butterfly Park and the Zoo. In addition to these two alternate power facilities, the Zoo administrative block and hospital are provided with power generators.

2.3.13 Park Administration Section

Since its inception the Bannerghatta Biological Park was under the administrative control of Department of Forest, Government of Karnataka. The Deputy Conservative of Forest Bannerghatta National Park Division was the administrative head of this park, which was treated as an independent range, in the national Park division.

During 2003 the biological park was separated from the National park and brought under the administrative control of **Zoo Authority of Karnataka Wide GO number APAG 271 APASE 2002 Bengaluru dated 09/09/2003**. As a result of bifurcation of **Biological Park** from **Bannerghatta National park** the park administration came under the control of Executive Director, who works under the Zoo Authority of Karnataka. The post of executive Director was of the rank of DCF at the time of bifurcation and later upgraded to CF during 2007-08. Depending on the importance and its dynamic growth, the post of Executive Director was further upgraded to the rank of CCF during 2011-12. At the time of transferring the jurisdiction of Biological Park, the government have bifurcated the Staff from Bannerghatta National Park and allotted to Bannerghatta Biological park. Since than the park has been managed by only temporary staff on outsource basis.

The Bannerghatta Biological Park is part of society registered under the Karnataka Societies Registration Act 1960, does not have its own Cadre and Recruitment rules. All The unit officers of different units under BBP and the Executive Director of BBP are on deputation to Zoo Authority of Karnataka from the departments like Forest, PWD, and Animal husbandry. Some of the ministerial staffs and protection staffs like Elephant mahuts, Elephant kavadies, MR and MRE employees are also on deputation from Department of Forest. Rest of the employs are taken on daily wage basis to take care of the management of animal and other ancillary works.

As on today 2 different categories of officials working in the BBP are

- Deputed employees
- Contract employees

2.3.14 GENERAL ESTABLISHMENT

➤ Deputation Staff

There are totally 27 staff working on Deputation from various Departments.

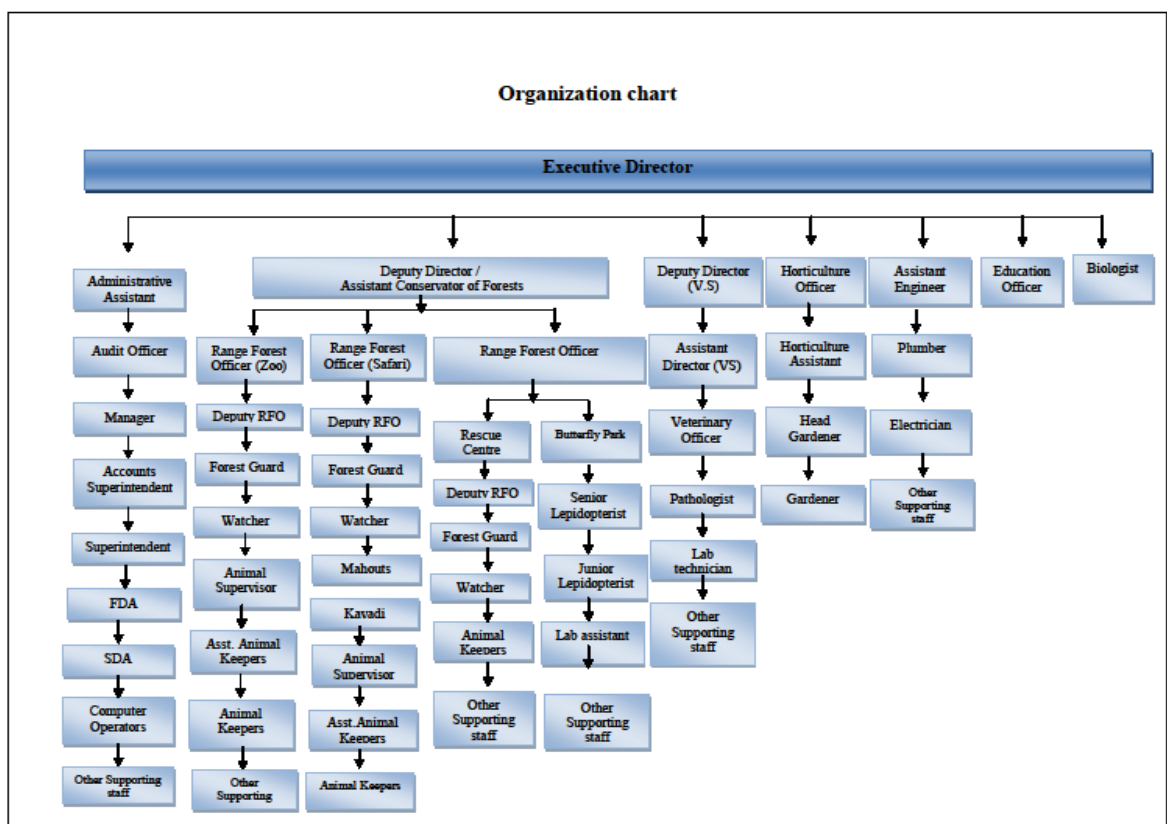
These deputed officials are mostly officers. The MRE and MR watchers originally working in the Department of forest, Government of Karnataka. The contract employees engaged by ZAK 2002 onwards are working on a crucial assignments such as animal keepers, hospital attendants and gate operators etc. The contractual employees are not counted under ZAK's cadre and recruitment rule. Depending on their experience and length of service, they are classified into 4 categories namely, **Category 1, Category 2, Category 3 and Category 4**. The employees in Category 1 have more than 10 years experience and working for an important assignment as animal keepers. The Category 2 employees having the experience between 05 to 10 years and also working on the important assignments in the park. Category 3 and 4 officials are less than 05 years in experience and mostly working as gate operators, night watch and ward and other assignments. The workers belongs to Category 1,2,3 and few in category 4 are the direct contract workers with BBP. They are working on direct contract with ED, BBP and their contract period is annual and being renewed every year. The rest of the workers are engaged on outsource basis.

“All these workers, more particularly, the Category 1,2,3 workers have the claim to regularize their employment. All these workers are skilled workers and few of them have gained expertise in their working field and their claim is genuine. The management authorities need to consider their claim compassionately in the larger interest of the park. Most of these workers are aged and few of them are in the verge of retirement and have no future and without them running the park is convoluted as there are no alternatives before the management. If the regularization of their job is intricate, they may be allowed to work on term contract with a fixed remuneration, which may be periodically revised based on the proficiency and experience. In this endeavor the “basic pay” fixed by the government to the cadre, they are working may be taken as bench mark wage and to which experience allowance may be considered. This shall be an immediate formula to resolve the issue.”

2.3.17.1 Organization Structure

Zoo authority of Karnataka is a registered society, controlling all the zoos of Karnataka. The affairs of the society managed by the **Member Secretary** under the advice of Governing Council. The Governing Council constitutes of 09 members and headed by a non official **Chairman**.

The Member Secretary of the Zoo Authority of Karnataka is an **IFS** officer of the rank of **Additional Principal chief Conservator of Forests** who will be the **Chief Executive Officer** of the society and also controls the management of all the zoos under the authority.



The Bannerghatta Biological Park is headed by the **Executive Director** of the rank of **Chief Conservator of Forests** is also an **IFS** officer, deputed from the Forest service. Presently there are **208** officials working in various capacities including the staff on deputation. Except the deputed staff of 27 numbers, all other employees are working on contract basis. As the nature of the job is more skilled and specialized they are engaged on direct contract with BBP. The present organization chart of BBP is as follows.

**The distributed of posts in different units under Bannerghatta Biological Park,
Bangalore**

The statement detailed below indicates the distribution of various officials under the different units such as Zoo, Safari, Rescue Centre etc.,

Sl. No.	Category Posts	ED Office	BBP ZOO	BBP Safari	BBP Rescue Centre	BBP Butterfly Park	BBP Hospital	Total
1	Executive Director,	1						1
2	Deputy Director	1						1
3	Asst. Director (AH & VS)						1	1
4	Senior Lepidopterist					1		1
5	Junior Lepidopterist					2		2
6	Veterinary Officer		1	1	1			3
7	Assistant Engineer	1						1
8	Administrative Assistant	1						1
9	Audit Officer	1						1
10	Accounts Superintendent	1						1
11	Range Forest Officer		1	1	1			3
12	Superintendent	2						2
13	Manager	1						1
14	Assistant Curator		1	1	1			3
15	Assistant Horticulture Officer	1						1
16	Assistant Manager	2						2
17	Biologist / Education Officer	2						2
18	Lab Technician					1		1
19	First Division Asst.	4						4
20	Senior Driver	2						2

21	Forester	1	1	1	1			4
22	Horticulture Asst.	1	1		1			3
23	Animal Supervisor		2	2	1			5
24	Second Division Asst.	5						5
25	Driver	5						5
26	Plumber		1	1	1			3
27	Electrician		1		1			2
28	Head Gardener	4						4
29	Animal Keeper		14	14	12			40
30	Veterinary Lab Assistant						2	2
31	Computer Operator	2	1	1	1		1	6
32	Forest Guard		4	3	3			10
33	Forest Watcher		4	3	3			10
34	Mahouts		10					10
35	Kavadi		10					10
36	Attender (peon)	3	1	1	1		1	7
37	Gardener	8						8
38	Assistant Animal Keeper		5	5	5	5	5	25
39	Sweepers		13			2		15
Total		49	71	34	33	11	10	208

2.3.17.2 Constraints

- No direct recruitment has been made since from the beginning of this park.
- No trained personal are available.
- Lack of skill among the contract workers
- Lack job security leads to no commitments in profession
- Inadequate salary and perk to the employees
- Lack of leave facilities
- Lack of job risk insurance and medical facilities

2.3.18 RESEARCH SECTION

2.3.18.1 Scope of Research

Zoo research is on, cross road as there is no definite agenda of research is identified and carried on. Most of the research in zoo management so far been carried out are of superficial in nature and does not have field applicability value. The zoo personal intending to carry out the research or any other scientific institutions undertaking the research programmes are not identifying the topics needed for the improvement of management. Therefore, there is a need to look into the zoo research with much more seriousness than the present state of casualness.

There is a tremendous scope and potentiality in the field of zoo research. The subject like **animal behavior, captive breeding, habitat enrichment, nutritional value** etc are of crucial importance from the point of captive management.

2.3.18.2 Ongoing research

Bannerghatta Biological Park being located in Bengaluru city has become a seat of research for many scientific institution, universities and departments. Most of the research activities initiated earlier have been related to animal epidemics and disease management. Bannerghatta Biological Park has already initiated a dozen of research programme on **collaborative approach**. In this initiation the research projects are financed by the BBP and research facilities available within BBP has been extended to the researchers. The following are the research activities carried out so far and which are having some field applicability value.

Sl. No.	Name	Project
1.	Dr. Kshma L. M	Evaluation of immune response to FPL vaccination in wild felines.
2.	Dr. Prashanth M. K	Studies on renal insufficiency in captive tigers and lions.
3.	Dr. Sanath Krishna M. K	Studies on heamatology, biochemistry and medical management of Indian spectacled cobra
4.	Dr. Karthik Manjunath	Comparative studies on Isoflurane and Savoflurane anesthesia in Russell's Viper.

5.	Dr. Mutturaj B	Wound management in captive animals
6.	Dr. Lalianpuii Kwalni	Parasitic studies on captive primates in Karnataka and Mizoram
7.	Dr. Nagaraj	Studies on prevalence of Salmonellosis in wild birds of Karnataka
8.	Dr. Shyalaja	Studies on Tuberculosis in captive bears and elephants
9.	Dr. Sachin Gondalli	Anesthetic studies in Sloth Bears
10.	Dr. Kiran Kumar K	Evaluation of Xylazine and Ketamine anesthesia with or without Midazolam in captive Lions
11.	Dr. Yashaswi Naravi	Comparative studies between Ketamine and Medetomidine anesthesia in Spotted deer (<i>Axis axis</i>)
12.	Dr. Nirupama Jaisingh	Salmonellosis in Wild animals
13.	Dr. Nandeesh	Environmental Enrichment in Captive sloth Bears

2.3.18.3 Constraints

- Absence of research officer and supporting staff
- Lack of research infrastructure
- Inadequate research facilities

2.3.19 CONSERVATION BREEDING

Although, Bannerghatta biological Park is 42 year old, no planned approach was visualized for breeding the captive animals within the BBP limits. The park was started in a very primitive way as Picnic Corner and gradually passed through the stages of **Mini**, **Medium** and ultimately as one of the **Major Zoo** in the country. Recreation is given importance in the management of this park. Therefore the initiatives either on conservation or education gain the importance. The mandates stipulated in National Zoo Policy 1998, recommends for the breeding of endangered species for reintroduction purpose in all the zoos in the country. However no such efforts of planned and organized breeding programme was initiated in the park. However,

breeding by default is happening in most of the animal species housed in the park. The important species successfully breeding in this park are Asiatic Elephants, Gaur, Sambar among the large mammals. In the cat family Royal Bengal Tiger and Lion are breeding successfully.

The favourable climate and the facilities provided in the park are mainly responsible for the breeding so far happened. At present no conservation breeding programme is taken up in the park. The Central Zoo Authority has identified some of the species for conservation breeding programme and the area also has been identified for the purpose.

2.3.19.1 Scope and Strength

- There is a big scope to undertake conservation breeding in most of the local species as the climate is favourable round the year.
- The facilities available in BBP limits are optimum in nature for this initiation.
- The adequate funds are available within the BBP as the revenue inflow is substantial.
- The scientific institutes like universities, colleges and other interested organizations are located in Bengaluru will have immediate access.

2.3.20 EDUCATION AND AWARENESS SECTION

2.3.20.1 Introduction

The National Zoo Policy 1998, mandates on all the zoos and parks in the country to draw a plan for education activity in ex-situ conservation field. It also advocates the theme of zoo education to be a linkage between the survival of plant and animal species in their natural habitat. The efforts are to be made to display such species in the zoo which are facing the threat and in the brink of extinction. The involvement of youths and the Colleges and Universities including the Non-Governmental Organization (NGO) shall be priority to educate the visiting people. Thus the zoos and parks will become a window to nature through which a proper understanding of environmental problems can be made.

The environmental education activities are regularly conducted in BBP to develop empathy on wildlife in the minds of youths and other educated people. Bannerghatta Biological Park is located within the city limits of Bengaluru and large number of educated people visits this zoo on a day to day basis. The number of colleges and Universities located in the limits of Bengaluru are under taking many research oriented programmes on different subject on animal management. The workshop and seminar on specific subject are conducted to pool the expert knowledge and harvest the same for the better and efficient management of zoos and parks. The following are the different education activities being conducted in the limits of Bannerghatta Biological Park.

i. Zoo Signage

All the animals and enclosures are provided with basic information bilingually on the animal, its habit, habitat and their geographical distribution etc. The biological information such as morphology, psychology, gestation and longevity etc., are also displayed on the sign boards. Within the zoo, Safari and Butterfly Park. The different set of advisory information such as **Do's** and **Dont's** are also displayed. Therefore, zoo signage has been treated as an important media of creating awareness and guiding visitors.

ii. Film shows

The Bannerghatta Zoo has a facility of well developed auditorium within its limits. The auditorium has a well developed infrastructure and sitting accommodation for 115 people. The conservation oriented films are screened regularly on a definite time schedule. On an average 02 to 03 film shows are shown for the benefit of visiting tourists. This unit also earns substantial revenue as considerable numbers of visitors prefer to avail this facility.

iii. Awareness Campaign

As the Bannerghatta Zoo is visited by more than five thousand people every day, the litter accumulation through their entry is also substantially high. The non-bio degradable waste accumulates in the zoo on day to day basis would be around 0.5 tons. Salvaging this litter on a weekly basis is needed. The interested youths from schools and colleges located within the Bengaluru city are involved in this activity and thus the environmental awareness is also propagated in the minds of tourists.

The youths from various schools and colleges are being given an opportunity to come to the zoo and participate in the awareness campaigns conducted regularly for such visiting groups. The basic subjects involved in such campaigns are conservation and protection of forest, wildlife and environment.

iv. Zoo guide – Audio Guide and Handouts

It is in order to guide the movement of visiting tourists within the zoo and safari for the meaningful understating of the displays, the concept of guide is introduced. BBP has the facility of Audio Guide, wherein the visitors can buy a secrete number card called **scratch card** which is pre-programmed with the relevant information. Once the number is dialed the visitors can get the information of the particular animal displayed. Since the card is valid for a limited time the visitor processing card has to be conscious of its validity and use.

The BBP also has printed brochure giving the basic information of the park.

v. Internship and Project work

Its in order to enrich the professional knowledge in the student community, field training is imparted to the veterinary science students of B.V.Sc. and M.V.Sc level. The course duration and the course subject are normally finalized by the university and accordingly the students on arrival in the zoo will go to their respective area of study. The veterinarian's in-charge of the BBP will be guiding

the visiting students to upgrade their practical knowledge. On an average a minimum of 10 to 15 students are exposed for practical programme and normally one to two batches are trained in every year.

As the part of academic mandates, the veterinary and other animal science students and Ecology background students comes to BBP on dissertation assignments. They visit during the project period and expose into the various aspects of park management and also take the advice of field experts working in the park management. On an average one to two such dissertation projects are under taken annually in BBP

vi. Orientation training (In-service officers)

Students from various Colleges, Universities, Wildlife Institutions and the in-service trainees from National Forest Academy, Deharadun, Wildlife Institute of India, Deharadun are regularly visit this park as part of their curriculum. These trainees are exposed to in-house classes apart from assigning them to work with animals, or in their area of specialization.

vii. Student Education Trip

The Students from all standards up to the university level are encouraged to visit the zoo, on education trip. When the students come on a pre confirmed visit to the park, they are allowed at free of cost and exposed for class room lecture and practical training in the field. The student group makes the casual visits in any one of the working day, also given concession entry into the park and such groups are also exposed for class room deliberations apart from field visit. The research scholars and any visits on scientific reasons are also allowed at free of cost and facilitate them to explore the required information from the field and with the interactions.

viii. Workshops and Seminars

The BBP organizes the regular programme of seminars and workshops on specific topics with regular intervals in the year. During 2012-13 a University level workshop was organized on topic of **management of Butterflies and their conservation**. BBP also become the place of visit, as a part of International Seminar organized by the Agricultural University on **Butterfly Conservation during 2012-13**.

ix. Animal Adoption Programme

It is to inculcate the awareness and responsibility of conserving the threatened and endangered fauna and flora in the mind of people and also to make them aware the sense of belongingness, a unique opportunity known as “**Animal Adoption Programme**” is launched in BBP. Although, the take off, this programme is slow in BBP, it is gaining popularity gradually and the demand is increasing to adopt more and more animals housed in the zoo. The animal adoption programme is not only encouraging the individual but many companies

and institutions are coming forward regularly on annual basis to adopt their favorite animal. On an average about 5 to 10 % of the total feeding cost of BBP is contributed through two major supporting programmes ie Animal Adoption Programme and Corporate Social Responsibility (CSR). It was during 2012-13 an amount Rs 75.00 lakhs were mobilized through CSR and around 10-15 lakhs from animal adoption programme.

x. Keepers training

Animal keepers of BBP are regularly exposed for in-house training and exploratory trips to the other zoos to acquire better knowledge in the management issues they are involved. Some of the important training modules commonly involved in the trainings are **enclosure enrichment, visitor's interactions, feeding methods** and **quarantine** with the new animals and crisis management etc. This kind of training are always been a refresher course, needed to refurbish the management knowledge of workers. This will give scope to enhance the management capability of each individual. Therefore, there shall be a regular training module of this kind in the management strategy of the Park.

xi. Zoo day

Every year during the month of March, involving all the zoo employees, a cultural festival is celebrated called "**Zoo Day**". This day is celebrated mainly to ensure the solidarity among the members of zoo community. The ethics of zoo management and the role of every keeper to be played in the overall up gradation of the institution and management of the captive animals are given a strong thought on this day. The cultural events and the sports activities are conducted on this day. The zoo day is normally observed on weekly holiday without affecting the care and management of the inmate animals. It is a practice in the BBP, that all the national environmental festivals like World Environmental Day, World Earth Day, Wildlife Week Celebrations are conducted.

xii. Trekking

The BBP, by virtue of the existence of large extent of natural forest, has the advantage to organize and conduct **trekking** programme to encourage the values of conservation education. The large chunk of forest area within the ambit of Biological Park and vast extent of National Park area is used for organizing the forest trekking programmes regularly over the years.

There are 02 trekking trails located well within the limits of Biological Park for long and short trekking.

➤ **Trek Route – 1**

Starting from **Mirza hill** passing through the forest and join the **safari road** and trek along the jungle road up to **Udigebande** and back on the same trail to **Mirza hill – 10 Km**

➤ **Trek Route – 1**

Starting from **Mirza hill** passing through **Kavalkere** and then to **Suvarnamukhi** along the old tar road in the forest and back to **Mirza hill** on the same trek road – 5 Km.

While trekking, the group is introduced to forest fauna and flora and briefed about the conservation value.

xiii. Celebrations of environmental festivals

(World Environmental Day, World Earth Day, Wildlife Week Celebrations)

It is a practice in BBP that, all the national environmental festivals like World Environmental Day on 5th June every year, World Earth Day, and Wildlife Week Celebrations from 1st to 7th October are celebrated every year.

To encourage the involvement of student community in these festival various programmes like quiz competition, drawing competition, painting competition, photography competition and tree planting programmes are organized. Further to involve the general public events like eco walk, wildlife walk, marathon events, bike rallies are conducted.

2.3.20.2 FACILITIES AVAILABLE

Although, the zoo education and awareness program is not strongly being carried out in BBP due to lack of qualified personal, following are the facilities created over the years to undertake this assignment seriously in the near future.

1. Auditorium
2. Amphitheater
3. Nature Museum Interpretation Centre
4. Nature Camp

2.3.20.3 Constraints

1. Absence of full time education officer
2. Inadequate facilities at auditorium and amphitheater
3. Inadequate infrastructure

2.3.21 RELOCATION OF RESIDENTIAL QUARTERS

As per the CZA guidelines, providing staff residential quarters within the zoo premises is prohibited. Presently staff residential quarters are located within the zoo premises. Even their distribution pattern in construction and sanitary system is not well designed and environment friendly. Location of staff quarters within the zoo premises also pose security problem because neither the entry nor the exit of all persons is possible to regulate at all time. Further the pet animals and stray dogs depending on the residences located within the zoo always mix with the zoo animals and becoming reason for spreading many diseases. Therefore, it is decided by the Governing Council, ZAK, to relocate all the residential buildings out of the zoo premises.

The existing quarters are totally demolished and the entire area be made available for constructing the **Zoo Hospital Complex** as approved in the Master Layout Plan.

The need for construction of **Hi-tech hospital** with all modern facilities has been felt by the Zoo Authority of Karnataka and finally approved by the Central Zoo Authority in the approved Master Layout Plan. Therefore all these residential buildings are to be demolished immediately by following the due procedure. The Zoo Authority of Karnataka in their 120th Governing Council Meeting have approved for demolishing the following residential buildings.

List of residential houses approved to demolish

SL No	Number and type of the house	Plinth area	Year of construction	Status
1	RCC		Unknown	
2	RCC Twin house		1981	
3	RCC Twin house		Unknown	
4	RCC Twin house		More than 35 years	
5	RCC		More than 35 years	
6	RCC		More than 35 years	
7	RCC		More than 35 years	

8	RCC		More than 35 years	
9	RCC		More than 35 years	
10	Sheet		More than 35 years	
11	Sheet		More than 35 years	
12	Sheet		More than 35 years	
13	Sheet		More than 35 years	
14	Sheet		More than 35 years	
15	Sheet		More than 35 years	
16	Sheet		More than 35 years	
17	Sheet		More than 35 years	
18	Sheet		More than 35 years	
19	Sheet		More than 35 years	
20	Sheet roof (brick wall)		More than 35 years	
21	Sheet roof (brick wall)		More than 35 years	
22	Sheet		More than 35 years	
23	Sheet		More than 35 years	
24	Sheet		More than 35 years	

All these buildings are very old and constructed before 35 years and not worth to reside in future unless they are renovated. Further, all the asbestos sheet roof houses were built to provide impermanent (transitory) accommodation to the staff at the time of developing this park three decades ago. These transitory houses are not fit for stay and they are worth to be demolished.

2.3.22 COMMITTEES OF THE ZOO

The Government of Karnataka and the Zoo Authority of Karnataka, through the management experience have felt the need of constituting various committees for the efficient and meaningful management of Bannerghatta Biological Park. These committees will look into the crucial issues such as management, development, research etc., and counsel the park management timely to improve the management competitiveness. The following are the committees constituted with explicit objectives and purpose. These committees to be act and advice the management as and when it is required. The members of these committees can undertake field visit whenever they feel and the situation demanded and advice the management for better performance. The committee as a whole and any member in it can take up any research activities in the zoo management to find out solutions to the management problems.

➤ **Advisory Committee**

The Government of Karnataka in their order FEE.252. FWL 2002 dated 28-04-2003 and also Rule 10 (A) of Memorandum of Association and the Rules of Societies of ZAK issued vide no. FFD 45 FWL 79, Bangalore Dated 19th July 1979 have provided for the constitution of advisory committee for the efficient and meaning full management of Bannerghatta Biological Park. This committee will advise on all the management issues relating to upkeep of the animals, maintenance, and development, enhancement of resources and health of the animal. This committee will advise on gardening, plant diversity, controlled breeding programme, population control, revenue and finance management and all other crucial management issues of BBP including research, security etc. The members nominated in the committee are changeable, at the prudence of the park authority, where as the members nominated by designation will remain as ex-officio members. This committee shall convene a meeting once in six month and with a minimum of two meetings annually.

➤ **Animal Health Monitoring Committee**

The management of health and hygienic of captive animals housed in various units of BBP is the serious concerned in the day to day management. The philosophy of animal welfare and ethics is based on the kind and quality of feed

and comforts are provided. Inadequate planning in the housing and their scientific management is often noticed.



Discussions with members of animal health monitoring committee

It is felt for the constitution of committee with the experts to collectively plan for the animal health and monitoring and guide and assists to implement the same meaningfully in the larger interest of the animals. Therefore an expert committee called “**Animal health Monitoring Committee**” is constituted. The member of this committee will be the ex-officio members. This committee will sit once in two months and at least four times in a year. The crucial issues like diet and disease management have to be dealt by this committee.

➤ **Management Plan Implementation and Monitoring Committee**

The Bannerghatta Biological Park is provided with a new Master Plan for 20 years to carry out the long term management activities such as construction, maintenance, collection of animals and their clinical management etc.,. Further the zoo research, zoo education and zoo extension are to be given utmost importance in the future course of management as approved in the Master Plan. The continuity in the management knowledge will ensure the planned development within the time stipulation. **The frequent shifting of management heads in BBP would create a knowledge gap and leads to an inconsistence growth of the**

organization. As a result the overall development of the organizations gets affected. It is in order to ensure the approved activities in the Master Plan are timely implemented with all technical inputs, the Zoo Authority of Karnataka felt the need of constituting the committee for oversee and monitor the execution of planned activities during the entire plan periods of 20 years and give timely advise to the BBP authorities and all implementing staff. Therefore an expert committee called **“Management Plan Implementation Committee for Bannerghatta Biological Park”** has been constituted by the Member Secretary Zoo Authority of Karnataka **vide their OM No. No. A1/ZAK.MPI&MC/CR-49/2012-13 dated: 08-03-2013.** It is a five member expert committee with 02 ex-officio members i.e. Executive Director, BBP and Member Secretary, ZAK. The two expert member nominated by name due to their rich experience in the field of wildlife management and personal involvement in preparation of plan document will remain in the committee till the end of plan period. The captive animal expert member may be appointed by the Member Secretary, ZAK or the Executive director, BBP in consultation with Member Secretary, ZAK for a period of time desired as a term appointment. This committee will convene at least one meeting in every quarter and at least three meetings in a year compulsory. It’s the obligation on the part of Executive Director to convene the meetings by inviting the members through advance intimations. If the Chairman of this committee or any expert member feels the need of convening the meeting, they can issue advice to the Executive Director to convene such meeting.

The following are the different committees constituted for the effective and meaningful management of Bannerghatta Biological Park. The details of the committees are as follows.

Sl. No	Name of the committee	Order No. & Date	Members
1	Advisory committee for the management of Bannerghatta Biological Park	No. A2/BBP/ Advisory Committee/CR-1/2011-12 dated:23-03-2012	<ol style="list-style-type: none"> 1. Chief Conservator of Forests, Bangalore Circle – Chairman 2. Executive Director – Member Secretary 3. Deputy Commissioner, Bangalore Urban District – Member 4. Superintendent of Police, Bangalore Urban District – Member 5. CEO, Zilla Panchayath, Bangalore Urban District – Member 6. Deputy Director & District Officer, Animal Husbandary and Veterinary Science – Member 7. HoD, Department of Zoology, Bangalore University – Member 8. Superintending Engineer, PWD South Circle, Bangalore – Member 9. Pro. S.N. Hegde, Former Vice- Chancellor – Member 10. Dr. S. Nagaraju, Former Register, KVAFS University – Member 11. Deputy Director, BBP – Member 12. Local officers of BBP – Member Invitees
2	Animal Health Monitoring Committee for managing the captive animals housed in BBP	No. A2/BBP/Animal Health Management/2011-12 dated: 27-07-2011	<ol style="list-style-type: none"> 1. Executive Director, BBP – Chairman 2. Dean, Veterinary College, Hebbal, Bangalore – Member 3. Director, IAH&VB – Member 4. Dr. M.R. Gajendragad, Principal Scientist, PD-ADMAS – Member 5. Dr. Narayana Bhat, Director, Institute of Wildlife Veterinary Research, Kudige – Member 6. Dr. Nadheef Fairoz, HoD, Meat Science, Veterinary College, Bangalore – Member 7. Assistant Director (Veterinary Service) 8. Sri R.S Suresh, IFS and Dr. R. Raju, IFS – Expert Members of Management Plan Implementation and Monitoring Committee.
3	Management Plan Implementation and Monitoring Committee for BBP	No. A1/ZAK.MPI&MC/CR-49/2012-13 dated: 08-03-2013	<ol style="list-style-type: none"> 1. Member Secretary, Zoo Authority of Karnataka (Ex-Officio) – Chairman 2. Executive Director (Ex-Officio), BBP – Member 3. Dr. R. Raju, IFS - Author of the Management Plan– Expert Member 4. Sri R.S. Suresh, IFS – Expert Member 5. One Captive Animal Expert

2.3.23 EVALUATION

The Bannerghatta Biological Park is exposed for periodical evaluation by the Central Zoo Authority. All the units of BBP like Bannerghatta Zoo, Bannerghatta Safari and Bannerghatta Rescue Centre are independently evaluated by the CZA team every year. The evaluation findings are taken on priority to attend for addressing the various issues and adopting the corrective measures.

In addition the process of self evaluation is being conducted by the BBP and Zoo Authority of Karnataka while inspecting the progress of various developmental works. The following are the methods adopted for the self assessment and evaluation in the park management.



Evaluation of zoo by CZA team

- i. Evaluation of the development works is being done by conducting monthly review meeting with all the unit officers and Deputy Director.
- ii. Self assessment of all the works carried out by each Range Forest Officer and Zoo Engineer is being done each officer respectively holding the charge of various functions in the management.
- iii. Regular monitoring of all the developmental and maintenance works ensures the corrections.
- iv. Monitoring of execution of developmental of works by the Member Secretary, ZAK, Executive Director, BBP, Deputy director, BBP and the

Range Forest Officers and also the Zoo Engineer will ensure the good quality of execution and shall help to avoid objections if any at a later date.

- v. The research works and other research oriented scientific works carried out by the zoo veterinarian, pathologist and zoo researcher will be discussed regularly in the various advisory committees which are comprised of scientist, experts, field researcher's and professors.
- vi. The animal keepers, supervisors and Range Forest Officers of the unit play a vital role in the management of zoo, safari and rescue centre as they have the highest responsibility of keeping the animals in good health.
- vii. The performance of all above mentioned staff will help in a long way to successfully undertake breeding programme which directly depends on the kind and quality of nutrition provided to the captive animals.
- viii. At present there is no arrangement to assess the performance of animal keepers. It is with a view to ensure the consistency in their performance, an "annual assessment report" should be prepared for each animal keeper to assess their performance and quality of their service.



Evaluation of zoo by CZA team

CHAPTER-3

3.1 CONCEPT PLAN

Bannerghatta Biological Park has the following constituent areas serving for conservation, education and recreation value apart from research and extension. The concept plan for each one of the constituent area has been approved by Central Zoo Authority.

3.1.1 Bannerghatta Zoo

1	Name of the zoo	Bannerghatta Zoo, Bannerghatta, Bengaluru
2	Category of the zoo	Large
3	Area of the zoo	41.08 Ha
4	Objective	<ol style="list-style-type: none">1. Conservation breeding2. Conservation, Education and awareness3. Conservation research
5	Theme of display	Board taxonomic and bio-geographical distribution Special emphasis on eastern and Western Ghats species.
6	Animal collection plan	Approved by CZA
7	Master Layout Plan	Approved by CZA
8	Staff strength	<ol style="list-style-type: none">1. Executive Director – 1 No.2. Deputy Director – 1 No.3. Range Forest Officer – 1 No.4. Assistant director (Veterinary Service) – 1 No.5. Zoo Veterinarian – 1 No.6. Forester – 1No.7. Forest Guard – 1 No.8. Forest Watcher – 1 No.9. Animal Keepers – As required.

3.1.2 Bannerghatta Safari

1	Name	Bannerghatta Safari, Bannerghatta, Bengaluru
2	Category	Large
3	Area of the safari	455.26 Ha
4	Objective	<ol style="list-style-type: none"> 1. Conservation breeding 2. Conservation, Education and awareness 3. Conservation research
5	Theme of display	Taxonomic and Natural display
6	Animal collection plan	<ol style="list-style-type: none"> 1. Tiger 2. Lion 3. Leopard 4. Sloth Bear 5. Indian Gaur, Nilgai, Sambar Deer, Cheetal and Barking Deer <p>Further the large population of wild boars and crocodiles are living in free range in the safari</p>
7	Master Layout Plan	Approved by CZA
8	Staff strength	<ol style="list-style-type: none"> 1. Executive Director – 1 No. 2. Deputy Director – 1 No. 3. Range Forest Officer – 1 No. 4. Assistant director (Veterinary Service) – 1 No. 5. Zoo Veterinarian – 1 No. 6. Forester – 1No. 7. Forest Guard – 1 No. 8. Forest Watcher – 1 No. 9. Animal Keepers – As required.

3.1.3 Bannerghatta Rescue Centre

1	Name	Bannerghatta Rescue and Rehabilitation Centre Bannerghatta, Bengaluru
		Associated centres Wildlife Rescue and Rehabilitation centre (Operated by a service organization called WRRC) 1. Bear Rescue and Rehabilitation Centre (Operated by a service organization called Wildlife SOS) 2. Life time care facility proposed
2	Category	Large
3	Area	17.50 Ha
4	Objective	1. Rescue and rehabilitation of conflict making animals in and around the forest 2. Rescue and rehabilitation of circus animals 3. Rescue and rehabilitation of dancing bears 4. Rescue and rehabilitation of small animals, birds and monkeys
5	Theme of display	No specific theme
6	Animal collection plan	No definite plan, however all the rescued animals will be received as and when they are arrived
7	Master Layout Plan	Approved by CZA
8	Staff strength	1. Executive Director – 1 No. 2. Deputy Director – 1 No. 3. Range Forest Officer – 1 No. 4. Assistant director (Veterinary Service) – 1 No. 5. Zoo Veterinarian – 1 No. 6. Forester – 1No. 7. Forest Guard – 1 No. 8. Forest Watcher – 1 No. 9. Animal Keepers – As required.

3.2 VISION STATEMENT

Protect, preserve and perpetuate the threatened fauna and flora by envisioning planet earth as a whole.

3.3 MISSION STATEMENT

- Our mission is to inculcate the awareness of nature conservation, provide natural habitat to all the animals suitable for their conservation and propagation through educational program.
- To connect visitor and wild animals through exemplary welfare, care and best educational practice to foster public support in ex-situ conservation

3.4 OUR VALUES

3.4.1 Integrity

Honesty is our philosophy as we are sincere, trust worthy and reliable.

3.4.2 Leadership

We commit to take all the responsibility for the animals in our care and the resources we command.

3.4.3 Commitment

We commit to our visitors to provide safe and enriched atmosphere in the park and extend courteous and warm attention to ensure memorable experience each time of their visit.

3.4.4 Participation

We undertake with all our collaborators to maintain an environment of transparency, trust and respect to maximize the creativity and productivity in our park.

1.5 FUTURE OBJECTIVES OF BBP

As already stated in earlier chapters, in the contemporary world, the main objective of the management of zoos in the country is to aid and assist in conservation of wild animals and their habitat. The “**Bannerghatta Biological Park**” shall in conformity with the aforesaid trend, endeavour to work towards sustainable development weighing both development and environment in equal

terms for animals and human. Emphasis shall be laid with more focused attention for conservation, breeding and education.

Special attention shall be paid towards the conservation of the rich bio-diversity of the State and that of the Western Ghats and Eastern Ghats through following sub-objectives

- i. To create conditions for captive conservation and breeding of endangered species of wild animals.
- ii. To serve as gene pool and gene plasm reserve for future biological research on wild animals and to facilities education studies on behaviour and breeding of different animals.
- iii. To provide rehabilitation to orphaned animals of endangered species rescued from the wild/circuses/crime etc.,
- iv. To educate and enlighten the public by displaying that the wild animals are equally important, interesting and essential for supporting the ecosystem
- v. To provide community with a window to nature education, love for wild animals and awareness and thus create empathy towards wild animals in them.
- vi. To provide recreational enjoyment to the public
- vii. To enhance the Zoo's financial stability and stewardship.
- viii. Provide opportunity to conduct scientific studies and carry out need based research on the fauna to enhanced the knowledge on animal behaviour, biology and ecology
- ix. To retain broad base of heterozygosity to ensure all founder animals to represent in each generation to avoid in breeding. This would essentially required that each animal born as part of programme is appropriately marked and sent to the identified zoos for the breeding

3.6 FUTURE STRATEGIES

The strategies proposed to achieve the objectives as per the stipulations of Central Zoo Authority and Zoo Authority of Karnataka for each management unit of Bannerghatta Biological Park is as follows

1.6.1 Strategy for Bannerghatta zoo

As per the approved Master Layout Plan of the zoo, the animal enclosures proposed for demolish will be done on priority to make available the space for developing new enclosures, green area and for other inDesktopfrastructure.

- i. All the animal enclosure approved for construction will be taken up for preparing the enclosure design, landscape and to provide other civic facilities
- ii. All the empty enclosures will be demolished.
- iii. Visitors path and service road will be formed as per the approved layout plan.
- iv. Under ground drainage and water supply pipe line will be laid
- v. Water supply from the source Doddannakere will be established.
- vi. The new enclosures for the existing animals will be built as per the approved Master Layout Plan if the area is vacant.
- vii. A new enclosure will be developed for the display of tigers as per the approved master layout plan.
- viii. All the enclosures proposed for modification will be attended.
- ix. New animal enclosures will be built as and when the animals are procured.
- x. Visitors facilities such as drinking water, rest places, food court and green area will be created as per the approved layout plan.
- xi. Even though the zoo has got a very good tree cover the new extension of the zoo is devoid of trees. These areas will be planted with various tree species to cover the canopy.
- xii. Adequate steps will also be taken to establish the hedge plants, grass, lawns, and flower beds all around the roads, paths, animal enclosures and other vacant places.
- xiii. Necessary steps will be taken to upgrade nature education and interpretation centre.
- xiv. It is proposed to develop Nature Museum for natural history on the first floor of BMTC complex.

1.6.2 Strategy for Bannerghatta Safari

- i. To improve the viability of tiger, lion, sloth bear and other herbivore animal housed in the safari will be exposed for detailed health scrutiny and avoid still born and in breeding
- ii. Physically and Genetically qualified animals identified for display and breeding
- iii. To provide optimum space as prescribed by Central Zoo Authority at least a minimum of 20 hectare will be provided to each carnivore safari and 30 hectare for herbivore safari.

- iv. The proposed new safari for the lion will be constructed with utmost priority in the earmarked area.
- v. The proposed new safaris for the leopard will be developed on priority basis.
- vi. The existing population of rescued bears in the bear safari will be shifted to life time care facility created in the rescue centre at the earliest.
- vii. The existing herbivore safari will be compartmentalized into 2 and use them on a rotational basis for public display alternatively.

1.6.3 Strategy for Bannerghatta Rescue Centre

- i. Life time care facilities will be created in the premises of rescue centre to house the rescued dancing bears by shifting from their present facilities i.e of Wildlife SOS. The area of rescue centre would be increased if so required by following due procedure.
- ii. Life time care facilities will also be created for housing the rescued mammals, birds, monkeys and all other wild animals involved in human conflict including from the WRRC.
- iii. The vacant facilities available at T and L blocks of Rescue Centre will be taken over to house the rescued animals such as tiger, leopard and other rescued animals/animals received from other mini zoos in the state.
- iv. The facilities created at the Rescue Centre with the financial assistance from the CZA will be taken over by the state as and when they fall vacant and maintained for further needful requirement.

1.6.4 Strategy for Butterfly Park

- i. The existing Butterfly Park will be upgrade by providing adequate infrastructure to breed and display most of the local varieties round the year. Adequate scientific inputs will also be provided by posting requisite number of technically qualified personal.
- ii. To enrich the scientific and display value of Butterfly Park an insectarium will be developed.
- iii. Importance will be given to organize seminars, workshops and other awareness programme to impart the knowledge and conservation values of butterflies.

3.7 THEMATIC VISION OF THE ZOO

The thematic vision is the arrangement of the anthology-collections with names and other details in taxonomical order or bio-geographical region wise. Zoo Authority of Karnataka aims on making this zoo as one of the best ecological set up since the park is blessed with natural forests. The design of animal enclosures and the support infrastructure would be such that can merge fully in the natural environment of the bio-geographical region.

1. Zoo shall house only such species of animals which can be provided with quality life of adequate longevity, so that they can procreate and lead to genetically self sustaining and behaviourally viable population in the zoo.
2. Zoo shall maintain highest standards of educative signage and interpretation facilities at the animal enclosures and visitors corners in the zoo to enable the visitors in acquiring a rewarding experience at the zoo.
3. To conduct research on animals and their behaviour, animal diseases, animal diets and feeding regime, resource optimization, identifying conservation problems, prioritizing actions, implementing conservation interventions and monitoring and evaluation of the effects of actions, to conduct symposium, publish research articles etc.
4. Captive breeding has now been accepted as one of the important means of saving endangered species. This zoo shall be developed into one of the conservation breeding centres for identified endangered faunal species of India. Planned reintroduction of the captive bred animals into their natural habitats as and when required.
5. Animal management in captivity is a challenging job that requires committed wildlife managers, who possess scientific competence and social awareness aided by communication skill. This zoo shall make concerted effort in the field of Human Resource Development by way of formal and informal training. Opportunity shall be offered to share their skills and experiences with colleagues in other zoos and with people and other organizations involved in similar activities.

6. Zoo shall endeavour to enhance the naturalistic and aesthetic value of the zoo through planting of indigenous species of trees with appropriately designed formal and informal gardens to develop an arboretum, orchidarium, biodiversity park and religious garden.
7. To serve as repository and rehabilitation centre for orphaned and rescued wild animals.



CHAPTER-4

FUTURE ACTION PLAN

4.1 ANIMAL COLLECTION

Bannerghatta Biological Park came into existence from the state of **picnic corner during the year 1971** and evolved to the level of one of the **major Zoo** in India today. From the inception the Zoo has not prioritized the animal collection and hence the facilities created to housing them are not based on any theme. However a consistent approach towards overall development led the way to the stage of having a good **Zoo**, a good **Safari**, a good **Rescue centre** and a well planned **Butterfly Park**. Presently the Zoo has some of the charismatic indigenous species such as **Loin tailed Macaque (LTM), Malabar Squirrel, Common Languor, Wild dog, Grey wolf** etc. The exotic species like Hippopotamus and varieties of Monkeys and Parakeets are the valuable addition to the present collection.

The concept of seeing the wild animals in free range open enclosure is termed as safari came into existence in **1979**. The first safari created in the vicinity of the Bannerghatta Biological Park is **Lion Safari** and there are 04 different safaris established in the BBP as on today namely **tiger Safari, bear safari, herbivore safari**. The BBP management has chosen only four larger mammals to be displayed in the safari for the benefit of public. Selection of these species for safari has been made keeping due regard for their past appearance (except Lion and White tiger) in this habitat and the present suitability of the local climate for long time survival, availability of optimum space, housing the infrastructure, health care facility as per the guidelines of the Central Zoo Authority. The National Zoo Policy 1998, envisages that number of species native to the region shall be 70% and other indigenous species to be 20% and exotic species shall not exceed 10%, but the same is not followed in Bannerghatta Biological park due to various reasons, however the required action will be taken in the plan period to maintain the population percentage in the collection as per CZA guidelines.

The Bannerghatta Biological Park has all the required facilities for ex-situ conservation of the species belongs to Eastern and Western Ghats. The

Karnataka State, has brought in large extent of forests under protected area network by declaring as National Park and Sanctuaries. The Zoo authority of Karnataka has conservation as the **vision agenda** in all the zoos under its control. Bannerghatta Biological Park also has a definite management strategy to have a well defined future collection plan of animals, to be displayed and bred in captivity. Acquiring of animals and regular animal exchange programmes will be undertaken to infuse new blood line to the existing population. All the possible efforts will be made for release of captive bred animals into the protected area as per the approved conservation breeding plan of endangered species. The list of species to be displayed in the zoo by limiting to its optimum capacity is provided below.

4.1.1 Proposed Animal Collection plan

Conservation and Zoo education are considered as important objectives of Bannerghatta Biological Park management, therefore, the following are the goals envisioned to achieve the objectives.

1. The ex- situ conservation of endangered species being the priority, the species endemic to the Eastern Ghats region given importance.
2. Impart Conservation education to the visitors about endangered species on the planet earth and to conserve them through a systematic approach with a special emphasis to Indian and Asian species.
3. Display of attractive species to the visitors to increase the visiting population to the Zoo, through which Zoo is self-sustainable.
4. Conserve the Gene pool of the representative species of regional, national and global importance.
5. Rescue and rehabilitate the deserted, orphaned, injured and sick animals.

Statement of proposed collection plan

S. N	Species	Present stock with zoo/ safari				Minimum Animals Required				Optimum number of Animals				Animals to be acquired or removed				Remarks	
		M	F	U	T	M	F	U	T	M	F	U	T	M	F	U	T		
	Mamals																		
1	Macaque Assames : <i>Macaca assamensis</i>	0	0	0	0	2	3	0	5	4	6	0	10	2	3	0	5	To be acquired	
2	Macaque Rhesus : <i>Macaca mulatta</i>	2	6	0	8	0	0	0	0	0	0	0	0	-2	-6	0	-8	To be taken off	

																			Display
3	Common or Hanuman Langour: <i>Presbytis entellus</i>	1	3	0	4	2	3	0	5	4	6	0	10	1	0	0	1	To be acquired	
4	Nilgiri Langgour: <i>Presbytis thoni</i>	0	0	0	0	2	3	0	5	4	6	0	10	2	3	0	5	To be acquired	
5	Lion Tailed Macaque: <i>Macaca silenus</i>	1	1	0	2	2	3	0	5	4	6	0	10	1	2	0	3	To be acquired	
6	Rhesus Macaque	2	6	0	8	0	0	0	0	0	0	0	0	-2	-6	0	-8	To be transferred	
7	Slender loris: <i>Loris tardigradus</i>	0	0	0	0	2	3	0	5	4	6	0	10	2	3	0	5	To be acquired	
8	Mouse Deer: <i>Tragulus meminna</i>	0	1	0	1	2	3	0	5	4	6	0	10	2	2	0	4	To be acquired	
9	Indian Squirrel: Giant <i>Ratufa indica</i>	1	2	0	3	2	3	0	5	4	6	0	10	1	1	0	2	To be acquired	
10	Leopard Cat	0	0	0	0	2	3	0	5	4	6	0	10	2	3	0	5	To be acquired	
11	Jungle Cat	0	0	0	0	2	3	0	5	4	6	0	10	2	3	0	5	To be acquired	
12	Great Civet/Small Indian Civet	0	0	0	0	2	3	0	5	4	6	0	10	2	3	0	5	To be acquired	
13	Toddy Cat : <i>Paradoxurus hemaphrodites</i>	1	1	2	4	2	3	0	5	4	6	0	10	1	2	0	3	To be acquired	
14	Leopard : <i>Panther pardus</i>	13	12	0	25	2	3	0	5	4	6	0	10	-9	-6	0	-15	Only animals of wild origin to kept on	
15	Tiger - Royal Bengal:- <i>Panthera tigris tigris</i>	21	19	0	40	2	3	0	5	14	6	0	20	-7	-13	0	-20	Only animals of wild origin to kept on	
16	White Tiger-Royal Bengal:- <i>Panthera tigris tigris</i>	4	3	0	7	2	3	0	5	4	6	0	10	0	3	0	3	By breeding	
17	Lion - Asiatic:- <i>Panthera leo persica</i>	1	0	0	1	0	0	0	0	0	0	0	0	-1	0	0	0	To be moved to some other zoo since	
18	African Lion: <i>Panthera leo leo</i>	0	0	0	0	2	3	0	5	4	6	0	10	2	3	0	5	To be acquired	
19	Lion - Hybrid <i>Panthera leo</i>	16	15	0	31	2	3	0	5	16	15		31	0	0	0	0	Circus lion not be displayed	
20	Himalayan Black Bear : <i>Selenarctels tibetanuts</i>	4	2	0	6	2	3	0	5	4	6	0	10	0	4	0	4	Minimum 1 female to be acquired	
21	Sloth Bear:- <i>Melursus ursinus</i>	18	17	0	35	2	3	0	5	4	6	0	10	-14	-11	0	-25	Only animals of wild origin to	

																		kept on
22	Jackal : <i>Canis aureus</i>	2	4	0	6	2	3	0	5	4	6	0	10	2	2	0	4	By breeding
23	Grey Wolf	3	0	0	3	2	3	0	5	4	6	0	10	-1	3	0	2	Minimum 2 females to be acquired
24	Heyna	0	0	0	0	2	3	0	5	4	6	0	10	2	3	0	5	By acquisition
25	Wild Dog	2	0	0	2	2	3	0	5	4	6	0	10	0	3	0	3	Female to be acquired
26	Elephant Indian : <i>Elephas maximus</i>	5	9	0	14	2	3	0	5	4	6	0	10	-1	-3	0	-4	Exchange / Transfer
27	Barking Deer : <i>Muntiacus muntjak</i>	2	3	0	5	2	3	0	5	4	6	0	10	2	3	0	5	By breeding
28	Swamp deer/Barasingha	0	0	0	0	2	3	0	5	4	6	0	10	2	3	0	5	Acquisition
29	Shanghai / Thamin Deer: <i>Cervus Eldi</i>	3	4	0	7	2	3	0	5	4	6	0	10	1	2	0	3	By breeding
30	Black Buck : <i>Antelope cervicapra</i>	7	14	0	21	2	3	0	5	6	14	0	20	-1	0	0	-1	
31	Chinkara: <i>Gazella Gazella benetti</i>	1	0	0	1	0	0	0	0	0	0	0	0	-1	0	0	-1	To be transferred
32	Nilgai or Blue Bull:- <i>Boselaphus tragocamelus</i>	3	5	0	8	2	3	0	5	6	14	0	20	3	9	0	12	By breeding
33	Sambar:- <i>Cervus unicolor</i>	88	90	0	178	2	3	0	5	30	70	0	100	-58	-20	0	-78	To be released in the forest
34	Hog Deer: <i>Axis Porcinus</i>	4	8	0	12	2	3	0	5	6	14	0	20	2	6	0	8	By breeding
35	Gaur or Indian Bison:- <i>Bos gaurus</i>	5	2	0	7	2	3	0	5	5	5	0	10	0	3	0	3	Acquisition
36	Porcupine : <i>Hystrix indica</i>	3	2	5	10	2	3	0	5	4	6	0	10	1	4	-5	0	By breeding
37	Mithun: <i>Bos Frontalis</i>	0	1	0	1	0	0	0	0	0	0	0	0	0	-1	0	-1	To be taken off Display
38	Otter	0	0	0	0	2	3	0	5	4	6	0	10	2	3	0	5	Acquisition
	Total - Mammals	213	230	7	450	66	99	0	165	187	294	0	481	-60	13	-5	-52	To be acquired
	Mammals - Exotic Species																	
1	Marmosets : <i>Callimico goeldii</i>	1	0	0	1	0	0	0	0	0	0	0	0	-1	0	0	-1	To be taken off Display
2	Hippopotamus : <i>Hippopotamus amphibius</i>	2	5	0	7	2	3	0	5	2	5	0	7	0	0	0	0	

3	Zebra : <i>Equus burchelli</i>	1	0	0	1	2	3	0	5	4	6	0	10	1	3	0	4	Acquisition
4	Chimpanzee	-	-	-	0	2	3	0	5	4	6	0	10	2	3	0	5	Acquisition
5	Hamadryas Baboons	1	2	3	6	2	3	0	5	4	6	0	10	3	4	-3	4	By breeding
6	Olive Baboons	-	-	-	0	2	3	0	5	4	6	0	10	2	3	0	5	Acquisition
7	Giraffe	-	-	-	0	2	3	0	5	4	6	0	10	2	3	0	5	Acquisition
8	Gnu/ Eland	-	-	-	0	2	3	0	5	4	6	0	10	2	3	0	5	Acquisition
9	Hunting Chetha	-	-	-	0	4	6	0	10	4	6	0	10	4	6	0	10	Acquisition
10	Jaguar	-	-	-	0	2	3	0	5	4	6	0	10	2	3	0	5	Acquisition
11	Puma	-	-	-	0	2	3	0	5	4	6	0	10	2	3	0	5	Acquisition
	Total - Mammals Exotic	5	7	3	15	22	33	0	55	38	59	0	97	19	31	-3	47	
	Birds																	
1	Great Indian Horn bill : <i>Buceros vicornis</i>	1	0	0	1	0	0	0	0	0	0	0	0	-1	0	0	-1	
2	Pea fowl Indian : <i>Pavo cristatus</i>	0	1	0	1	2	3	0	5	2	3	0	5	2	2	0	4	
3	Pea fowl white : <i>Pavo cristatus</i>	2	5	0	7	2	5	0	7	2	5	0	7	0	0	0	0	
4	Spoon bill : <i>Platalea leucorodia</i>	2	2	1	5	4	6	0	10	4	6	0	10	2	4	-1	5	
5	Kalij Pheasant: <i>Lophurs leucomelana</i>	1	0	0	1	0	0	0	0	0	0	0	0	-1	0	0	-1	To be deleted
6	Fowl Jungle Grey : <i>Gallus sonnerati</i>	1	0	0	1	2	3	0	5	2	3	0	5	1	3	0	4	Acquisition
7	Red Jungle Fowl:	2	0	0	2	2	3	0	5	2	3	0	5	0	3	0	3	Acquisition
8	Barn Owl : <i>Tyto alba</i>	0	0	1	1	0	0	0	0	0	0	0	0	0	0	-1	-1	
9	Long eared Owl : <i>Asio otus</i>	2	1	0	3	2	3	0	5	4	6	0	10	0	2	0	2	
10	Parakeet alexandrine : <i>Psittacula euparia</i>	1	3	0	4	2	3	0	5	4	6	0	10	1	0	0	1	
11	Parakeet rose ring : <i>Psittacula krameri</i>	17	4	0	21	2	3	0	5	4	6	0	10	-13	2	0	-11	
12	Baya Weaver : <i>Ploceus phillinus</i>	0	0	2	2	0	0	0	0	0	0	0	0	0	0	-2	-2	

13	Heron Night : <i>Nycticorax nycticorax</i>	0	0	2	2	2	3	0	5	4	6	0	10	2	3	-2	3	
14	Ibis White : <i>Threskiornis acthiopica</i>	20	35	0	55	4	6	0	10	6	14	0	20	-14	-21	0	-35	Exchange
15	Munia Black Headed : <i>Lonchura punctuelata</i>	1	5	0	6	0	0	0	0	0	0	0	0	-1	-5	0	-6	
16	Stork painted : <i>Mycteria leucocephala</i>	2	2	0	4	0	2	0	2	0	2	0	2	-2	0	0	-2	
17	Grey Pelican : <i>Pelecanus philippensis</i>	5	5	0	10	5	5	0	10	6	14	0	20	1	9	0	10	By breeding
18	Red crested pochard : <i>Netta rufina</i>	17	14	0	31	4	6	0	10	6	14	0	20	-11	0	0	-11	
19	Chines ring necked Pheasant: <i>Phasianus colchicus torgatus china</i>	2	4	0	6	4	6	0	10	4	6	0	10	2	2	0	4	By breeding
20	Silver Pheasant : <i>Lophra nycthemera nycthemera</i>	2	1	0	3	2	3	0	5	2	3	0	5	0	2	0	2	Acquisition
21	Golden Pheasant : <i>Chrysolophus pictus</i>	5	5	0	10	4	6	0	10	4	6	0	10	-1	1	0	0	Exchange
22	Lady Amherst's Pheasant: <i>Chrysolophus amherstiae</i>	2	4	0	6	4	6	0	10	4	6	0	10	2	2	0	4	By breeding
23	Black Swan	0	1	0	1	2	3	0	5	2	3	0	5	2	2	0	4	
24	Green Winged Macaws : <i>P.Chloropterus</i>	1	1	0	2	1	3	0	4	1	3	0	4	0	2	0	2	
25	Emu: <i>Dromaius novaehollandiae</i>	2	2	0	4	0	2	0	2	0	2	0	2	-2	0	0	-2	
26	Ostrich : <i>Struthio Camelus</i>	3	4	0	7	4	6	0	10	4	6	0	10	1	2	0	3	By breeding
27	Rhea	0	2	0	2	0	0	0	0	0	0	0	0	0	-2	0	-2	
28	Orange Winged Amazon Parakeet	2	2	0	4	2	3	0	5	2	3	0	5	0	1	0	1	
29	Sun Conure	1	1	0	2	2	3	0	5	2	3	0	5	1	2	0	3	
30	Crowned Crane	3	1	0	4	2	3	0	5	2	3	0	5	-1	2	0	1	
31	Cockatiels :	1	1	0	2	2	3	0	5	2	3	0	5	1	2	0	3	
32	Love Birds	8	7	0	15	0	0	0	0	0	0	0	0	-8	-7	0	-15	To be taken off Display
33	Cockatiels :	48	45	0	93	0	0	0	0	0	0	0	0	-48	-45	0	-93	

	Total Birds	154	158	6	318	62	98	0	160	75	135	0	210	-85	-32	-6	-53	
	Reptiles																	
1	Crocodile long snouted Gharial: <i>Gravialis gangeticus</i>	0	0	0	0	2	3	0	5	4	6	0	10	2	3	0	5	
2	Crocodile Marsh : <i>Crocodylus palustris</i>	0	4	0	4	2	3	0	5	4	6	0	10	2	-1	0	1	
3	Indian Star Tortoise : <i>Geochelone elegans</i>	17	11	0	28	4	6	0	10	6	14	0	20	-11	3	0	-8	
4	Red - eared slider Turtle: <i>Trachemys scripta elegans</i>	4	5	89	98	4	6	0	10	6	14		20	0	1	0	1	
5	Indian Mud or Flap shell Turtle: <i>Lissemys punctata</i>	0	0	89	89	4	6	0	10	6	14	0	20	6	14	-89	-69	
6	Batagar Terrapin or River Terrapin: <i>Batagar baska</i>	3	2	0	5	4	6	0	10	6	14	0	20	1	4	0	5	
7	Indian Rock Python : <i>Python molurus</i>	12	8	0	20	4	6	0	10	6	14	0	20	-6	6	0	0	
8	Indian Cobra: Naja Naja	2	2	0	4	4	6	0	10	6	14	0	20	2	4	0	6	
9	King Cobra: Ophiophagus Hannah	10	10	0	20	4	6	0	10	6	14	0	20	-4	4	0	0	
10	Viper Russels: <i>Vipera russelli</i>	1	1	0	2	4	6	0	10	6	14	0	20	3	5	0	8	
11	Rat snake: <i>Pythas Muccousus</i>	0	0	8	8	4	6	0	10	6	14	0	20	4	6	-8	2	
12	Snake Sand Boa: <i>Eryx conicus</i>	0	0	30	30	4	6	0	10	6	14	0	20	6	14	-30	-10	
13	Common Indian Monitor Lizard: <i>Varanus Bengalensis</i>	1	1	0	2	4	6	0	10	6	14	0	20	3	5	0	8	
14	Iguana Green	0	0	1	1	4	6	0	10	6	14	0	20	4	6	-1	9	

4.1.2 Exotic species

Presently the zoo is housing considerable number of exotic birds and animals. However, care is taken to follow the guidelines of CZA during the plan period. The details of native and exotic as per the present collection is as follows.

4.2 Concept of New Master Plan

4.2.1 Themes of display

The Bannerghatta Zoo at present, displaying 1294 number of animals belongs to 87 number of species. The available collection of animals displayed in the Zoo, are proposed to be displayed on a theme broadly based on **taxonomical classification** with **Bio-geographical** regions. Based upon the themes adopted, the animals are proposed to be displayed in different sections. In the proposed layout plan the entire Zoo has been divided into 04 sections.

4.2.1.1 Section 1

This section can be called as **Apes park (Vanara vana)** because, important species of monkeys are displayed here. This section covers Assamese macaque, Common langur, Nilgiri langur, Loin tailed Macaque and other important species are Aquatic birds, Slender Lorries, Giant squirrel, White Tiger, Himalayan Black bear, parrots and parakeets including some terrestrial birds.

The other important buildings presently comes within this section are Executive Directors Office, Wildlife Museum and Auditorium and the proposed Zoo range office complex. In this section more than 40% of the total area will be maintained as the green area as per CZA guidelines.

4.2.1.2 Section 02

In the section, the proposed animals to be displayed are Leopard cat, Jungle cat, Large Indian Civet, Small Indian Civet, “Serpentorium”, Gharrial, Marsh crocodile, walk through Aviary, mouse deer, Sanghai deer, Hog deer Swamp deer and hippopotamus. This section will be called as **Reptile Park (Uraga vana)**. In this section also the existing green area is around 35% of the total area.

4.2.1.3 Section 03

This section starts from Olive baboon, Hamadrys baboon, wolf, wild dog, fox, hyena, jackal and otter. The existing pond in this section will be converted into Otter enclosure by retaining its natural condition. This section has vast extent of rocky out crop intermixed with small patches of natural forest. The total extent of this area covers nearly 30% of rocky outcrop and

15% of green coverage. This section can be called as **Cannids park (Swana vana)**.

In the proposed layout map of Bannerghatta zoo the other important areas associated with the Zoo administration and exists in the section are Zoo hospital complex and new entrance plaza with parking facility.

4.2.1.4 Section 04

It covers the entire area of new extension of the zoo. This section can be named as **Africana** because, most of the animals proposed to be housed in this section are from **African continent**. The African animals such as, **Zebra, Giraffe, Ostrich, Chimpanzee, Gnu/Eland, African lion, Hunting Cheetah, Jaguar and Puma** are planned to be displayed. The visitor circulation path is defined in such a way that all the enclosures are covered by traversing at one go without any scope for confusion. In this section more than 30% of the area is proposed to be developed as green cover. Out of 09 animal enclosure proposed to build in this section, 08 enclosures are to be built new and the existing half completed enclosure, earlier planned for **Jaguar** to be remodeled and constructed now for housing the **Hunting cheetah**. The exotic bird complex proposed in this section is planned to display most of the **African and South American Birds**. The Zoo visitors can rest and relax in the spacious green area provided in this section. The outer peripheral service road and inner loop of visitor's path are very much distinct and defined for a definite purpose.

4.2.2 Visitors Amenities

1. Layout Map and Signage

Signage boards consisting layout map and visitors circulation path and the directions to animal houses will be displayed at prominent places in each of the section within the zoo. Further each animal house will be provided with good information about the animal species displayed through an educative sign board.

2. Drinking Water facilities

The drinking water points with proper facilities of storage with shade will be constructed 02 numbers in each of the section within the zoo premises. In addition remodeling existing water points are also considered.

3. **Food Court**

Large number of local crowd visits the zoo regularly as they are coming mostly for spending the day out side. They carry food with them and to facilitate them for eating 02 number of food courts having the facility for eating 50 members at a time will be constructed away from the animal zone within the zoo.

4. **The signage boards**

The signage boards of all the animal houses will be redone with proper design and information. Adequate number of sign boards for showing direction, animal information etc., will be displayed for the benefit of visitors.

5. **Ramps and battery operated tramp car facility**

To facilitate the easy entry for the physically challenged, children and veterans, facility of ramps and battery operated tram car will be provided.

6. **Visitors Shelters facility**

In addition to the existing visitors shelter 03 more visitor shelters will be constructed at an interval of about half kilo meter for the benefit of visitors for their rest and relax.

7. **An Emergency Medical Service Centre facility**

An emergency medical service centre with First Aid facility with a medical attendant will be established within the zoo premises.

8. **Cloak Room facility**

A cloak room facility will be created at the New Entrance Plaza to deposit the luggage and other belongings of the visitors.

9. **Helpline Number facility**

A dedicated helpline number will be electronically displayed at prominent places for any emergencies for the benefit of the visitors.

10. **Public Relation desk**

A public relations officer will be engaged to attend the visitors and their grievances and to receive feedback, suggestions and complaints from the visitor's apart from providing timely and required information to the visitors.

11. **E-Ticketing facilities**

The existing E-ticketing facility will be popularized in order to minimize and mitigate the day to day management at the counter.

4.2.3 OTHER FACILITIES

4.2.3.1 New Entrance Plaza

This area includes Swarnamukhi Garden, parking facility, leased area to BMTC, and proposed Zoo administrative block. This area is located at the



southeast corner of Bannerghatta Zoo, falling within the jurisdiction of Bannerghatta Range. The facilities to be developed in this area is based on the approvals of CZA.

4.2.3.2 Development of parking area

The incomplete works at the parking area such as, partition and interlocking the parking strips, providing drainage and improving the parking strips, will be completed during the plan period. There by the parking area will provide the facility for parking **650** vehicles at a time on one rotation of two hours. On any given day, the parking facilities of BBP can accommodate **2500 vehicles** in a day on four rotations of two hours each.

Parking area for two wheelers has been cordoned out of the total parking area, opposite to Sulabh Souchalaya. This area will be developed by providing suitable flooring, drainage and shade.

To regulate the entry and exit of the vehicles and also to provide adequate security for the visitor's vehicle, an **electronic surveillance system** with **automatic gates** will be installed.

To enrich the aesthetic value of parking area and also to provide shade adequate planting activities will be carried out by planting flowering plants and medium sized trees.

4.2.3.3 Development of Suvarnamukhi Garden



The partially developed Suvarnamukhi garden opposite to new entrance plaza will be developed by providing additional facilities such as, construction of band stand and providing aesthetic lighting etc.

Security house will be constructed at the main entry gate to provide facilities for security personal to operate their activities round the clock. Further a naturally blended water tank with a capacity of **5000 liters** will be built over the security building to provide the water facilities.

4.2.3.4 The road lies in front of new entrance plaza will be developed with nature merging tiles to facilitate safe and smooth walk of visitors. This would enrich the beauty of the area also.

- 4.2.3.5** The entrance area at the Safari boarding point will be developed by providing a platform and other infrastructure to facilitate for the benefit of safari visitors.
- 4.2.3.6** The approach road to the biological park from **old entrance of the Zoo till parking area** will be developed into **double lane road** with median and spacious footpath on either side. This will not only help in good traffic management but also enrichment of the aestheticness of the area.
- 4.2.3.7** To enrich the aesthetic beauty of the existing new entrance plaza detailed plan will be prepared to develop with appropriate architectural designs.
- 4.2.3.8** The **entrance and exit gate of safari** located opposite to “Butterfly Park entry” will be developed by providing **hi-tech CC Cameras** and **electronic surveillance system** to count and monitor the movement of all vehicles in general and safari vehicles in particular.
- 4.2.3.9** The Bandekere tank located abutting to butterfly garden will be developed as a storage tank and the adjacent area will be developed to facilitate the visitors for their rest and relax.

4.2.4 NEW PROPOSALS

4.2.4.1 Zoo Hospital Complex

The Zoo hospital complex is located at northwest corner of the Zoo, falling within the jurisdiction of Bannerghatta Zoo Range. This complex has an area of around 04 acres with an adjoining rock garden and existing water body called **Benakanakere**. Presently, there are 24 old transit houses built for the residential accommodation of the staff. Out of 24 numbers of houses only 9 buildings are with RCC roof and balance 15 are the transit houses with sheet roof. The governing council Zoo Authority of Karnataka have approved to dismantle of this entire house complex and make available the place for the construction of Zoo hospital complex.

4.2.4.2 Zoo Square

The Bannerghatta Biological Park was established as part of the Bannerghatta National Park **vide GO Number AFD/61/FWL/74 dated 6-25/9/1974**. Although, the Zoo was started as a picnic corner over 16 Ha in the beginning of the Bannerghatta Biological Park during 1971, the biological park was officially notified during 1974. By 2013 the park has completed 40 years. In commemoration of the 40th year of this park the idea of creating a monument was generated in the mind of park authorities. In

lieu of that it was decided to have a monument built within the park premises preferably out of the main zoo campus. As a result the concept of establishing the **Zoo Square** has occurred and accordingly the governing council ZAK have also agreed and resolved to take up this project. Therefore the construction of Zoo square as per the approved design by the ZAK will be taken up for construction within the park premises preferably out of the main zoo campus. This will be a center of attraction for the visitors.

4.2.4.3 Nature interpretation Centre

The BMTC authorities have built the **TTMC** complex within the area of 02 acre of land belongs to BBP. The complex is located abutting to the New entrance Plaza with a passage of entry. The Government of Karnataka at the time of granting permission to the BMTC authorities have resolved that, the entire area available on the **first floor of TTMC complex** will be handed over to BBP for establishing **Nature Interpretation Centre**. The interpretation centre will be a repository of forest and wildlife knowledge and creation of conservation awareness among the visitors.

4.2.4.4 Children corner

Large number of children come as zoo visitors along with their parents and is commonly found in the park. There is no dedicated place to suite the requirement of children in the zoo premises. As a result parents are finding difficulty in managing their children while perambulating the zoo. Therefore there is a necessity to have the required facility for engaging the children. Therefore it is proposed to develop a children corner one each at Zoo and Butterfly Park by erecting suitable playing equipments

4.2.4.5 Zoo Education Centre and Amphitheatre

The KSTDC Ltd and JLR Ltd have jointly agreed to spare 05 acres of area available in the Hill View Restaurant premises. The facility was used by the KSTDC Ltd for some times and finally handed over to JLR Ltd for continuation. The Central Zoo Authority has agreed to establish Zoo education centre in the unused area of Hill View Restaurant Complex. It was agreed to spare half of the unused building as resolved in the meeting held on 29-11-2012 in the chambers of MD, JLR Ltd and wherein both the MDs and ED, BBP for establishing the Zoo Education Centre. Accordingly action will be taken to develop Zoo education center in this building.

KSTDC Ltd is a serious entrepreneur, has the project of Zoo education and awareness in Bannerghatta Biological Park. The Bannerghatta Biological Park authorities have handed over about 1.5 acre of area to KSTDC for building the **Nature Interpretation and Nature Education** facility. However in the passage of time the priority of establishing Nature Interpretation Center got diluted. However it is decided to revive the **Nature education centre** and put up for the public use. Due to various administrative reasons the project did not come through and the built up area left unused. KSTDC Ltd entered into MOU to use the facilities with JLR Ltd mainly to run it as a restaurant. Since the facility is closely located at New Entrance Plaza and most of the visitors interested in this kind of activity, the old proposal KSTDC Ltd may have to be revived in the larger interest of Zoo community. Therefore, half of the existing facilities will be used as “**Nature Education**” facility.

4.2.4.6 Visitors circulation

The new Master Layout Plan provides for a well demarcated visitors path which is of self guiding in nature. The appropriate signage planned for display at prominent places will make much easier to the visitors to circulate within the zoo premises to cover each and every display.

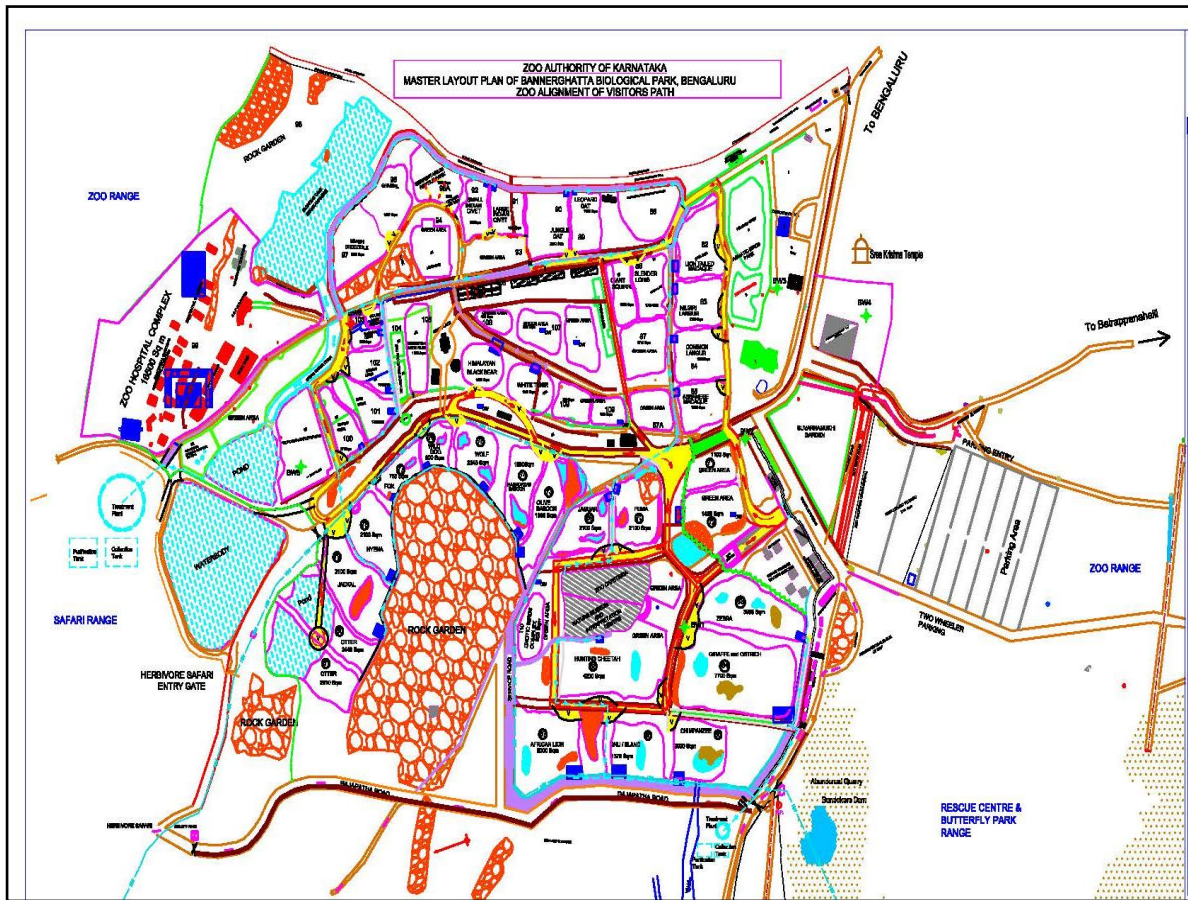
It is in order to help the physically challenged, veterans and fast track visitors a **short loop circular path to a length 1.2 km** has been laid. This path will start from the Main Gate at New Entrance Plaza and directly enter into the Section-1 (Ape Section) passing through primates and aquatic bird and bird park and reach Section – 4 (Africana) area at proposed Puma enclosure. In the Section – 4, the circulation path is starting from proposed Puma enclosure and runs along Jaguar enclosure and exotic birds further proceeding to Hunting Cheetah through African Lion. Further from Hunting Cheetah visitors will have an opportunity to see Gnu/Eland, Chimpanzee, Giraffe, Zebra and finally reach the Zoo Square before exit and complete the path. In the African Section visitors will have an opportunity to avail the facilities of Zoo Cafeteria and Nature education centre. The approximate time required to complete the smaller loop is between **1 hour 45 minutes to 2 hours**.

The **second circulation path** also starts from main entrance in the New Entry Plaza and enter into the Section – 1 (Ape Section) area, where visitors can see primates, birds and smaller mammals, slender lorries and giant squirrel. From there

the path further continue towards western side and entering into Section – 2 (Uragavana). The displays in the section – 2 like jungle cat, large and small Indian civet can be seen before entering into Reptile Park. Serpantarium will be most attractive in the reptile park where varieties of snakes will be displayed and further proceed to see gharials and crocodiles and then enter into the deer park to see varieties of deers such as mouse deer, barking deer, sanghai deer, hog deer, swamp deer and finally hippopotamus to complete the Section-2. Now the visitors will enter into Section -3 (Canidae Section) areas starting from Otter pond, they will have chance to see jackal, hyena, fox, wild dog, wolf and baboons to complete the Section – 3. The visitor will have a chance to see Himalayan Black Bear and White Tiger immediately after wolfs before they reach baboon enclosures. The visitor's circulation path further moves towards eastern direction and enter into Section – 4 at Puma enclosure.

In the Section – 4, the circulation path is starting from Puma enclosure and runs along Jaguar enclosure and exotic birds further proceeding to Hunting Cheetah through African Lion. Further from Hunting Cheetah visitors will have an opportunity to see Gnu/Eland, Chimpanzee, Giraffe, Zebra and finally reach the Zoo Square before exit to complete the path. In the African Section visitors will have an opportunity avail the facilities of Zoo Cafeteria and Nature education centre. The approximate time required to complete the longer loop will be between **three and half to four hours** on a steady and normal walk. The entire traverse either on small loop or long loop will have ample of opportunities to rest and relax on lawns, greens and visitor's shelter. They will also have a chance to eat their packed food on food court at a designated places and potable water for drinking at regular walking intervals.

A well designed direction signage and layout map erected at prominent places including one at entry will help to see the specific display in the limited time available with the fast track visitors.



4.3 ANIMAL SECTION

4.3.1 Zoo Concept

The exhibition of animals in Bannerghatta Zoo has been planned to arrange based on broad taxonomical order and also on the concept of bio-geographical distribution. Accordingly it has been planned to redesign the entire layout of old zoo and extending the area towards north-eastern side to add up many more enclosures. Accordingly the entire area of the proposed zoo has been classified into 04 sections from the point of meaningful display and maintenance of animals. All the existing enclosures have been assessed and evaluated from the point of their suitability and identified for up gradation and dismantle. There is a provision to build the new enclosure for housing the animals in spacious display area.

4.3.2 Animal enclosures

There are totally 58 number of animal enclosures exists in the present zoo which are small and congested. Further most of these enclosures are over crowded in a limited area without providing adequate space and privacy to the inmate animals. The display of animals also not based on either taxonomic or bio-geographic. The enclosures have been added based on the availability of animals and resource on an ad-

hoc basis. Inadequate facilities of sanitary and water also added to the improper management of animals based on scientific guidelines fixed by CZA. Therefore, large numbers of enclosures are proposed for dismantling and up gradation apart from building the new enclosures.

4.3.2.1 Existing enclosures proposed for dismantling

The following are the existing old and cramped enclosures proposed for dismantling.

Sl. No.	Name of enclosure	Enclosure Number
1	Elephanty	2
2	Parrot	3
3	Hippopotamus	8
4	Marsh crocodile	11
5	Rose ringed parakeet	12
6	Rest place	13
7	Peacock	14
8	Monkey	15
9	Empty enclosure	16
10	Old ticket counter	17
11	Kiosk	18
12	White Peafowl	19
13	Nandini Milk Parlor	20
14	Children Play ground	21
15	Indian Giant Squirrel	22
16	Caiman crocodile	23
17	Lion Tailed Monkey	25
18	Rhesus Monkey	26
19	Gharial crocodile	27
20	Parrots	28b
21	Indian Porcupine	29
22	Red eared turtle	30
23	Iguana	31
24	King Cobra	32
25	Star Tortoise	33
26	Russells wiper	35

27	Rate snake	36
29	Indian python	37
30	RFO office	38
31	Information Centre	39
32	Green shop	40
33	Cobra	41
34	Duck	42
35	Love birds	43
36	Aquarium	45
37	Ostrich/Emu	48
38	Zebra	50
39	Pump house	51
40	Mithun	52
41	Jackal	53
42	Leopard	54
43	Rest place	55
44	Eagle/Owl	59
45	Khalija Pheasant	61

4.3.2.2 Existing Enclosures to be modified

The following are the enclosures proposed for either extension or modification as per the approved Master Layout Plan.

Sl. No.	Name of enclosure	Enclosure Number
1	Park	5
2	Wildlife Museum and Film Auditorium	7
3	Pelican Grey	9
4	Laboratory	10
5	Himalayan Black bear	44
6	Zoo Hospital	49
7	Spotted Deer	56
8	Store and kitchen complex	58

4.3.2.3 Proposed new enclosures

The following are proposed new enclosures in each section in the zoo

Section – 1 (Ape Section)	
1	Aquatic birds Park
2	Lion tailed macaque
3	Nilgiri Languor
4	Common Languor
5	Asamese Macaque
6	Slender lorries
7	Indian Giant squirrel
8	Bird Parks (Parrots and Pheasants)
9	Information Centre & Security Room
10	Auditorium
11	Executive Director Office
12	Green area/Rest place
13	Drinking water facilities – 3 nos.
Section - 2 (Reptile Park)	
1	Aquatic walk through
2	Leopard cat
3	Jungle cat
4	Large Indian civet
5	Small Indian civet
6	Lizards
7	Serpentorium
8	Garial crocodile
9	Marsh crocodile
10	Hippopotamus

11	Deer Park – Mouse Deer, Barking Deer, Sangai Deer, Hog Deer, Swamp deer
12	Green area/Rest place – 1 no.
13	Drinking water facilities – 1 no.
14	Toilet – 1 no.
Section - 3 (Cannids Park)	
1	Himalayan Black bear
2	White Tiger
3	Olive Baboon
4	Hamadrys Baboon
5	Wolf
6	Wild dog
7	Fox
8	Hyena
9	Jackal
10	Otter
11	Terrestrial birds park
12	Zoo office complex
13	Rest place/green area – 2 nos
14	Drinking water facilities – 3 nos
15	Toilet – 1
16	GLSR - 1
Section – 4 (Africana)	
1	Zebra
2	Giraffe/Ostrich
3	Chimpanzee
4	Gnu/Eland

5	African Lion
6	Hunting Cheetah
7	Exotic Birds complex
8	Jaguar
9	Puma
10	Zoo cafeteria
11	Nature Museum
12	Zoo square
13	Green area
14	Toilet
15	Drinking water points – 2 nos

4.3.3 Safari Concept

The Bannerghatta Biological Park has a well established safari park consists of herbivores and carnivores safaris separately

4.3.3.1 Existing safari to be modified

4.3.3.1.1 Herbivores Safari

The total extent of herbivore safari is 68.00 Ha including 06 acres of area given to Jungle Lodges and Resorts to run the nature camp. The entire area is supported by thick vegetation which includes bamboo and dry deciduous tree species. It has perineal water source with 04 major water bodies exists in it. There is good population of wild crocodiles in these ponds and always provide a very rare and good sight to the visiting tourists. In addition the herbivore safari supports large population of free range wild boar. This area also supports varieties of bird life

Very often a good number of rescued herbivore animals are brought to BBP and released into safari after observing the quarantine protocol. The animals introduced in such manner will constitute a new blood line and helps to have a broad base of gene pool in the population.



Modification proposed

- It is proposed to bifurcate the entire herbivore safari into 02 compartments. The reasons for bifurcation are,
 1. The area is very large and sighting of animals is poor.
 2. Herbivore population denudes the vegetation.
 3. Rotational closure will give the area an opportunity of rejuvenate.

The approved Master Layout Plan of Safari Range has sanctions for bifurcating the area, accordingly the area will be bifurcated into Unit-1 with an extent of 31.00 Ha and Unit-2 with an extent of 37.00 Ha. Care has been taken to retain the water bodies in both the enclosures.

- Each of the unit will be kept open for display on rotational basis annually
- It is proposed to provide an exclusive feeding area in both the units of herbivores safari. The feeding kraal such proposed will be covered from the top to avoid access to free range birds, monkeys etc., The feeding cell will be kept outside the safari area but abutting to the safari boundary to have access and it will be away and invisible to the visitors.
- Both these units will be allowed to rest and rejuvenate in the alternate year.
- The entry gates would be re-constructed following the design suggested by CZA.



Deepanakere in Safari

4.3.3.1.2 Tiger Safari

The guidelines on creation of safari parks issued by the Central Zoo Authority mandates to keep a minimum area of 20.00 Ha for carnivores safari and 30.00 Ha for ungulates safari. The CZA guidelines also mandates that as the number of the animal's in the safari increases, the area should proportionally be increased and it must be ensured that the biological requirements of the animals housed therein are fully met. The animals should be kept in viable and compatible groups. In case of lions a small viable pride and in case of tigers a viable compatible group of 02 animals to be kept. In case of bear small groups less than 10 in number or a compatible pairs limiting to 10 numbers be kept.



The present tiger safari area is measuring a total of 20.00 Ha and the following units are located.

- (1) Indira Gandhi Tiger Safari
- (2) White Tiger Safari
- (3) Appaiah Tiger safari
- (4) Lion Safari.

Out of the 04, the smallest unit is White Tiger Safari measuring around 1.00 Ha. In addition to the open area, all these safaris are provided with the housing facility which has occupied sufficiently large area. All these establishments together are over crowded. The lion and tiger population presently accommodated in these segments are sufficiently large. Therefore all the animals will not get regular chance to use the safari area and hence they are confined to small cells and kraal area. Therefore it is proposed to remove the internal barricade and made one unit of 20.00 Ha to treat as Tiger Safari.

It is also proposed to keep only compatible pair or small groups of tigers to be displayed in the safari. The aged, non compatible and single animal will be shifted out of safari area and be accommodated in the **life time care facility** at the Rescue and Rehabilitation centre.

Relocation of White Tigers

The existing White Tiger Safari is planned to relocate by providing optimum space both at zoo and safari. Presently there are 07 white tigers in the inventory of tiger safari out of which few are (compatiable) planned to relocate to the zoo. The approved Master Layout Plan of Bannerghatta Zoo provides for housing the tiger in the zoo and the approved Master Layout Plan of Safari also provides for merging the existing white tiger safari into the main tiger safari. Therefore it is necessary to relocate the white tiger in the zoo.

Activities proposed

- It is proposed to dismantle the internal fencing constructed for making different blocks.
- It is proposed to treat the existing stream and its branches providing check dams to impound the water at 03 different places.
- It is proposed to upgrade the existing safari road to a length of 1.70 km.



New tiger house

4.3.3.1.3 New Lion safari

As per the mandates of CZA to provide a minimum of 20.00 Ha, area to have safari, it is decided to shift all the lions housed in the existing lion safari. The existing lion safari is part of tiger safari having an area of 05.00 Ha only. Presently there is large population of lion numbering to 32, housed in the enclosures built at lion safari. There are only 02 to 03 compatible groups qualified to display in the safari. There are aged, single, incompatible lions not qualified to display in the safari are still housed in the animal houses of lion safari. The population is overcrowded and management of all these animals becoming difficult and all the animals are not getting their turn to have the safari facilities as they are uncompatible. Therefore it is decided to ease the congestion and provide optimum space to the fit safari animals.

The Master Layout Plan approved by the CZA provides for the construction of new lion safari adjacent to existing Bear and Tiger Safari. The natural forest area of **20.75 Ha** has been identified which has a network of rough jungle road. As the area is supported by natural vegetation with moderately undulated terrain best suited for the lion safari. The visitors after the view of bear safari will have access to new **lion safari**

through which they can enter into proposed **leopard safari** and existing tiger safari at one go.

Infrastructure to the new safari

- It is proposed to develop 1.5 km length of safari road to facilitate the visitors vehicle movement
- It is proposed to create an artificial water pond in an area of 02 to 03 acres at a suitable point depending upon the drainage within the new lion safari.
- It is proposed to build animal houses in 02 blocks at north-west corner in the new lion safari. Each animal house will have 06 number of animal holding room.
- The entire area of new lion safari will be barricaded with open moat and chain link mesh fence as provided in case of tiger safari.
- Both the animal houses will be provided with underground drainage connected to an exclusive soak pit which will be cleaned and sanitized periodically.

4.3.3.1.4 Bear safari

The existing bear safari will be retained as such. The facilities monitored by a service organization namely **Wildlife SOS** in an area of **8.00 acres** within the existing bear safari will be immediately shifted to existing rescue and rehabilitation centre behind Butterfly Park which in turn will be shifted later on to the life time care facility planned to create within the premises of Rescue and Rehabilitation Centre.

There are around 52 dancing bears rescued and brought from various parts of the country are allowed to house in the facilities available at bear safari. These bears are infected with **tuberculosis** which is identified as the **human strain tuberculosis**. Housing such infected sloth bears within the Biological Park area and abutting to the national park will not only contaminate the inhabited animal population but will be a potential threat to the health and security of captive and wild population of this region. Therefore, it is a management decision to shift all the rescued sloth bears from facilities maintained by Wildlife SOS within the bear safari. After shifting the rescued bears the facilities available within the bear safari will be used for the purpose of existing bear safari.

Infrastructure facilities

Following are proposed infrastructure facilities

- The existing safari road within the bear safari to a length of 0.65 km will be upgraded.
- It is proposed to create 3 numbers of artificial water ponds within the bear safari in addition to the ponds already created.
- It is proposed to construct UGD line in the animal house connecting to exclusive soak pit which will be cleaned and sanitized periodically.

4.3.3.1.5 Proposed new Leopard Safari

The approved Master Layout Plan for the Bannerghatta Safari provides for the establishment of new **leopard safari** to facilitate the visitors and also to undertake the conservation breeding initiatives. The concept of leopard safaris is in consideration since 2000. Since, leopard enclosures existing in the zoo area are very small and congested to house and exhibit. The leopard also needs the free zone for their movement, therefore the safari enclosure like other big cats (tiger & lions) inside the natural forest was planned to develop. A pilot work on leopard safari has been implemented in Bhadravathi Forest Division, Simoga circle over an area of 05.00 ha with raised chin link mesh compound fitted with solar fencing (as we have already done in herbivores safari to prevent the entry of wild leopard into the herbivores safari) to contain the leopards within the safari, the visitors can be taken in vehicles for viewing the leopards as in the tiger safari. In the same method with further improvements it is proposed to develop the forest area in between bear safari and tiger safari under the control of this park into Leopard Safari.

This is an area having stunted growth of deciduous forest with rocky out crops, which is quite similar to the natural habitats of the leopards. Design of leopard safari will be finalized in consultation with CZA.

4.3.4.3 PROPOSED NEW ACTIVITIES

4.3.4.3.1 Elephant Care centre

The Bannerghatta Zoo was housing the Asiatic Elephants for the public display as it used to attract huge crowd during all the days. There are 14 Asiatic elephants in the animal inventory of Bannerghatta Zoo. As per the decision of Central Zoo Authority, not to display the Asiatic elephants, all the 14 Asiatic elephants have been shifted out of the Zoo and presently housed in an exclusive area in the open forest called as **Elephant Camp**. Since there is no adequate facilities and infrastructure created at the elephant camp located in the forest, the management is becoming problematic. Therefore there is a necessity to establish **Elephant Care centre** in the limits of Bannerghatta Biological Park.

The Bannerghatta Biological Park is blessed with large extent of natural open forest lying in between Safari and Zoo which is an elephant Corridor also, as large numbers of Asiatic elephants have in habituated this area. It is planned to establish Elephant Care Centre to house the Zoo elephants comfortably. In the approved Master Layout Plan for Bannerghatta Safari, the CZA authorities have accorded permission to establish elephant care centre.

The open natural forest lying between the herbivores safari and proposed lion safari to an extent of 60.00 Ha, has been identified to establish the Elephant Care Centre with night shelter facilities. The entire area of 60.00 Ha is supported with thick bamboo breaks with a big water body called Sigekattekere intermitted with grasslands. The Sigekattekere is a perennial water body supports the availability of water round the year. Out of 60.00 Ha of area around 10.42 Ha has been identified to create night shelter facilities. This area will be cordoned by barricading through a rubble stone wall to a length of 1.61 km of perimeter. The facilities like kitchen and shelter will be created to cook the food and prepare the food concentrates. All the Elephants will be contained in this night shelter area during the nights, which is sufficiently large to hold 20 number of elephants during the night.



The balance area of 49.50 Ha will also be barricaded with suitable means either by rubble stone wall/rail fence/solar fence to a length of 3.26 Km of perimeter. The elephants are allowed to use this area during day time. Depending upon the carrying capacity of this 49.5 Ha to house 14 elephants sustainably the alternate area within the park limits will also be identified to run this facility for a longer time.

4.3.4.3.2 Creation of lifetime care facilities

The inflow of rescued animals to Bannerghatta rescue centre is increasing day by day. This is mainly due to rescuing large number of conflict making animals in the forest and around forest fringe villages. Further the shifting of Birds and smaller animals from WRRC and rescued dancing bears from Wild life SOS to Bannerghatta Rescue centre will exert additional pressure on the existing rescue and rehabilitation centre run by BBP. Therefore, it is an urgent need to establish **Life time care facilities** for the rescued animals to facilitate for their comfortable stay and management.

The Central Zoo Authority have approved the Master Layout plan for establishing the Lifetime care facility in the Rescue Centre area, adjoining to the existing Tiger block. The proposed lifetime care facility will have exclusive setup for different animals with spacious enclosures. The details of area planned to each setup is as stated below,

- Mammals 7200 mts²
- Primates 1800 mts²

- Birds 8700 mts²
- Reptiles 1600 mts²
- Herbivore animals 2000 mts²

All the segments of Lifetime care facilities will be provided with exclusive barricading and water facilities. The animal houses and enclosures will be designed by duly following the dimensions and space fixed by the CZA for each different species. With the addition of Lifetime care facility in the rescue centre, the Bannerghatta biological Park will be the only one, in the nation to have a comprehensive and integrated rescue and rehabilitation centre.

4.3.4.3.3 Upgradation of existing wildlife rescue centre

The wild life rescue centre presently has 02 blocks wherein large number of lions and tigers rescued from the Indian circuses are housed. In addition large number of **leopards** and **tigers** involved in the human conflict are being sent to this rescue centre as the facilities are better managed. The existing accommodations in both the blocks are insufficient, as the inflow of rescued animals are increasing day by day. Further the shifting of rescued sloth bears from existing bear safari will demand for the additional facilities in the rescue centre. Therefore, there is a necessity to create additional facilities within the limits of rescue centre to meet the demand. It is proposed to create the facilities to house the rescued dancing bear by extending the existing facilities.

4.3.4.3.4 Conservation Breeding Centre

The Zoos began to realize their potential as positive and influential force for conservation of wild life. Integrated conservation is achieved most effectively when the animal management activities of the park are linked to one another conceptually and are strategically co ordinate both externally and internally. The main aim of the conservation breeding is to ensure the stability of threatened species through a collaborative breeding program.

Before initiating the breeding program of any species, Zoos and parks should clearly identify the objectives for which species breeding program is initiated. It is worth to select the founder population which is socially, genetically

and demographically viable. In addition the available data on their biology and the factors affecting the program and housing facility need to be examined before initiating a captive breeding program.

Every individual animal involved in the breeding program have to be identified and marked. Conduct scientific study in a planned manner on these founder members to collect information and confirm that there is no scope for In-breeding. The human imprinting on the new recruits raised out of plant breeding program is to be avoided as their reintroduction to nature is contemplated.

Many Zoos in the Indian scenario have already reserved few species as part of co-operative and co-ordinate national or regional breeding programs. The Central Zoo Authority is a regulatory and monitoring authority to facilitate the conservatory breeding programs among the Zoos within India. The Bannerghatta Biological Park has been identified as one of the centre for conservation breeding by virtue of vast extent of area and facilities available at the command.

The following are the species identified and approved by CZA to initiate conservation breeding program in Bannerghatta Biological Park.

Reptiles

1. King Cobra
2. Monitor Lizard

Birds

3. Grey Jungle Fowl
4. Red Jungle Fowl
5. Red Spur Fowl
6. Grey Partridge

Mammals

7. Gaur
8. Indian Wolf
9. Dhole
10. Lion Tailed Macaque
11. Nilgiri Langur
12. Indian Giant Squirrel

4.4 VETERINARY SECTION

4.4.1 Proposed Hospital complex

The existing facilities in the veterinary section are not capable of meeting the increasing demand of animal treatment, surgery and other management issues. Therefore it is proposed to have a dedicated zoo hospital complex in a very spacious area of around 16,500 square meters which is nearly 4 acres. The most important facilities such as Hi-tech hospital, quarantine, isolation rooms and inpatient animal's wards will be built in this area.

The proposed Hi-tech hospital will be equipped with Operation theater, radiology unit, diagnostic laboratory, pharmacy, physiotherapy ward and inpatient wards.

In addition to the Hi-tech hospital there will be two **veterinary clinics** established one each at **Rescue Centre** and **Safari**. Both these veterinary clinics will be provided with an independent veterinary doctor with basic facilities to run the veterinary clinics.

4.4.2 Proposed Hospital staff pattern

The cadre and recruitment rules approved by the Zoo Authority of Karnataka for Bannerghatta Biological Park provides the following staffing pattern to strengthen the zoo hospital

Sl. No.	Category Posts	BBP ZOO	BBP Safari	BBP Rescue Centre	BBP Hospital
1	Deputy Director (AH & VS)				1
2	Asst. Director (AH & VS)				1
3	Veterinary Officer	1	1	1	3
4	Veterinary pathologist*				1
	Lab Technician*				1
5	Veterinary Lab Assistant				2
6	Computer Operator				1
7	Attender (peon)				1
8	Assistant Animal Keeper				5
	Total				16

4.4.3 Hi-tech Facilities

Though the hospital presently having the basic equipments and infrastructure, the following equipments will be procured to improve the efficiency of the hospital apart from upgrading the existing infrastructure.

4.4.3.1 Surgery theatre

There is a need to establish a well equipped and furnished operation theater. It is proposed to procure all the high tech surgical instruments to carry out the crucial surgeries to animals.

4.4.4.3 Radiology

The existing X-ray room facilities are having limited scope and efficiency. Therefore, it is proposed establish a well equipped radiology units with hi-tech machines and laboratory.

4.4.3.3 Portable X-Ray machine (Digital)

This would be useful for diagnosing fractures, joint problems, chest disease and some of the kidney problems

4.4.3.4 Portable colour doppler ultra sound scanner

It is required for the accurate e diagnosis lesion and pregnancy

4.4.3.5 Portable ECG unit

It is required to monitor the anesthetic state and also to care critically ill animals

4.4.3.6 Ophthalmoscope

It is required for examination of eye and diagnosis of eye problem.

4.4.3.7 Electronic amplifying stethoscope

All the veterinarians working in the zoo hospital will be provided with electronic amplifying stethoscope which would help the doctors to examine the animals in detail and more efficient manner.

4.4.3.8 Digital Endoscope Unit

It is required for examination of GI track and upper respiratory track.

4.4.3.9 UV lamp

It is required for operation room sterility

4.4.3.10 Laparoscope unit

It is required for conducting paprotomy surgery.

4.4.4 Laboratory

The existing laboratory functioning in the zoo premises is being operated on collaborative approach with IAH&VB, Hebbal, Bengaluru. The same approach will be continued in the new Hi-tech hospital proposed to establish within the zoo premises. The adequate infrastructure and other required facilities will be extended by the park authorities and man power shall be shared by the IAH&VB. The laboratory will continue to work as Wildlife Disease Diagnostic Laboratory (WADDL).

In addition to the existing facilities in the laboratory, some of the other necessary equipment and instruments like “**binocular microscope, hot air oven, semi - auto analyzer, urine analyzer**” etc., will be procured. Clinical samples like blood, serum, feces, urine, sputum, skin scraping will be tested for disease diagnosis regularly.

4.4.4.1 Pharmacy

The existing hospital has the facility of storing the emergency and commonly used medicines with a limited quantity. The Bannerghatta Biological Park housing more than 1000 animals from all its units often faces the emergency treatment during night and odd hours. Bannerghatta being a small town doesn't have the 24 hour services of veterinary medicines. Since the emergency situations occurs in all the units of Bannerghatta Biological Park results with casualties due to lack of medicines. There is a need to have an exclusive pharmacy integrated to the zoo hospital. Accordingly it is planned to obtain licence to establish pharmacy dedicated to the zoo animals only.

4.4.4.2 Incinerator

There is no mechanism of disposal of carcasses of animals die in the park. As per the recommendations of Technical committee of Central Zoo Authority under 7(IV)(a) the normal method of disposal of carcasses should be either burring or burning. The carcasses of animals that die of disease like anthrax or such other communicable diseases should be disposed off without opening the body.

Presently the Bannerghatta Biological Park does not have any facilities for disposal of dead animals. They are burnt in the open field or if they are larger animals displayed in the safari they are buried nearby place within the safari as the body is can't be lifted out due to heavy weight. This situation at times warns the

threat of spreading the disease. Therefore an Incinerator will be installed next to the existing postmortem room.

4.4.4.3 Vaccination protocol

- Every zoo should have definite vaccination protocol. The mandates of Central Zoo Authority under Section 4(C) of Legislation, Policy, Guidelines and strategy for the zoos in India provides for screening of zoo animals against ecto and endo infectious parasites at least once a year.
- De-worming schedule should be followed to all the captive animals at least once in 06 months. All the de-worming protocol and its impact report has to be made to Executive Director once in 6 months compulsorily.
- Vaccination – All the animals housed in the zoo, safari and rescue centre be covered for vaccination protocol against disease such as Foot and mouth, anthrax, hemorrhagic septicemia (HS) etc. The vaccination report has to be submitted to the ED, immediately after completion for the follow up action.

4.4.4.4 Quarantine

Quarantine is the separation of newly received animals from those already in a population displayed. The purpose of such isolation is to prevent the introduction of inspections animals to the resident captive population. In addition, during this period new animals can be accustomed to their new environment, keepers and diet. The veterinary management during quarantine period is most crucial as pervious management history to be compared and monitored with the present status of the animal during quarantine.

4.4.4.4.1 Period of quarantine

- A minimum quarantine period of 31 days is required and must.
- A 60 days period is generally preferred and will be considered as optimum.
- A 90 days period being the ideal length particularly with animals with no birth and parentage records and medical history.
- Quarantine length should be normally based on origin and medical history of the animal in question and potential disease or infections problems.

In the newly proposed zoo hospital complex of Bannerghatta Biological Park a well designed quarantine facility is planned. The quarantine facility has been located at the corner of the zoo hospital complex away from the Hi-tech Hospital planned. This facility will be developed keeping in view of isolation of

all mammals including larger mammals, primates, cats etc. The appropriate ramp for loading and unloading the animals and facilities such as feeding troughs, drinking water, bathing area will be provided. A dedicated staff to exclusively look after the quarantine facility will be identified and deployed. A system of recording the quarantine data's regarding the management of quarantine animals will also be established.

4.4.4.5 Animal Ambulance

The translocation of animals between the units of the park and even within the unit is happening regularly in the day to day management. There is no dedicated facility to translocate the animal within and outside and most of the time normal trucks and vehicles are used. Further the wild animals involved in the human conflict also faces with serious injuries and they are to be shifted with that condition covering long time and distance to reach the rescue centre. Therefore there is an immediate need to have a dedicated animal ambulance with facilities of oxygen, **First Aid** and even with the instruments for emergency surgical interventions. Further the ailing captive animals need to be immobilized in many circumstances and minor surgeries are to be performed for which a mobile veterinary ambulance with hydraulic, having provisions to hold clinical examination table, small x-ray machine, ultra sound scan, ECG, immobilizing equipments will be provided to the effective functioning of veterinary wing. It is proposed to have an exclusive animal ambulance to BBP.

4.4.4.6 Indoor Wards

In the proposed zoo hospital complex, there will be an exclusive setup of indoor wards for housing the sick and injured animals. It is proposed to build 10 rooms by providing the facilities of water and sanitation. The sick and injured animals require the constant attention of the veterinarians will be housed in these rooms. All the animals housed will be under close supervision with watch and ward facilities round the clock. The animals will be housed till they completely recovered and to become fit enough to relocate back to their enclosure.

4.4.4.7 Veterinary Database

At present the observation made and treatments given to various captive animals are being recorded in the history sheet manually and electronically. The details of the treatment and various veterinary interventions are entered and stored in the zoo database. There is a computer facility with an internet connection

provided to the hospital to have an update knowledge in the field of veterinary clinical, medicinal and surgical management

An effective animal health programmes require that all the animals be marked permanently and their individual records can be maintained. The disease problems can be identified and treated accordingly. Priority is being given for preventive health programme than curative.

4.4.4.8 Health care of captive animals

The Mandates stipulated in the “**Legislation, Policy, Guidelines and Strategy**” in the book Zoos in India published by CZA will be adopted. Efforts will be taken to follow the guidelines given in the “**Standards, Guidelines and Protocol on Disease diagnosis and cure of wild animals in Indian Zoos**” published by Indian Veterinary Research Institute, Izathnagar and CZA, New Delhi. Routine hygiene and sanitation measures in the animal enclosures like cleaning of enclosures, lime wash, clearing bushes and weeds, spraying of insecticides, disposal of waste, regular inspection of food being carried out to prevent disease and other health related problems. Improvements to the store will be made mechanizing the operations to keep the contamination as nil. Water from the bore wells and other sources will be filtered and treated to avoid water born diseases. The proposed new Hi-Tech Veterinary Hospital will be ensured to be at far with international standards.



Tiger Raj, with splint cast

4.4.4.9 Epidemic Management

- i. There needs to be a detailed health care protocol for preventing some of the diseases through regular vaccination and deworming and also disinfection prophylactic measures
- ii. The animals are to be dewormed once in 03 to 06 months or based on the results of the caprological examination.
- iii. It is a must to vaccinate all the herbivores like Indian Gaur, Swamp Deer, Manipuri Deer, Nilgai, Sambar Deer and Cheetal against the Hemorrhagic Septicemia (HS), Foot and Mouth (F&M) and black quarters diseases. This vaccination has to be carried out before monsoon season every year.
- iv. The elephants are to be vaccinated against anthrax.
- v. The livestock in the surrounding villages are to be vaccinated against common contagious disease with the help of animal husbandry department.
- vi. All the felids are to be vaccinated with fell – o- vax against Feline Pan Leucopenia, Feline infectious Rhino Tracheitis and Feline Calici Virus
- vii. In the herbivores safari during 2011-12 a serious disease known as Malignant Catarrhal Fever (MCF) was noticed when 02 gaurs with an interval have died within a span of 24 hours of noticing their dullness. Therefore the appropriate vaccination for MCF also needs to be given
- viii. In the bear safari during 2011-12 a disease known as canine distemper was noticed when the postmortem examination done on the dead sloth bear. This was believed to have occurred due to village dogs living around. Therefore appropriate prophylactic measures needs in the bear safari area also.
- ix. The visitors must be allowed into the zoo through a foot bath kept at the entry point in the entrance complex and animal keepers and supervisory staff also should pass through the foot bath (Potassium Permanganate solution in the tray) before entering into the animal houses.

4.4.4.10 Rodent Control

A successful control programme is continuous and required concerted efforts by the zoo staff to minimize harborage and food for pets, in addition to the use of mechanical and chemical control methods. Choice of agent, method of use, and storage may minimize zoo animals access to pesticides and risk of secondary poisoning. Common zoo pets may serve as important diseases vectors. For example, rodents can harbor and spread *Listeria* *Salmonell* and

Leptosprira spp and Francisella tularensis. They consume or contaminate animal food and deposit droppings everywhere.

Rodents are great source of many diseases to zoo animals. Not only feeds on zoo animals feed and also contaminate the feed, water and environment by way of urination and defecation. It acts as a vector for many bacterial, viral and parasitic diseases. Hence control of rodents inside the animal enclosure and animal night cells in the zoo is prime important. The following methods can be used to control rodents in animal enclosures

- All the new enclosures will be made rodent proof by using appropriate design foundation.
- Provide fool proof to prevent the entry of rodents inside animal enclosure and animal cells
- Periodical checking and plugging all rodent holes in and around animal enclosures by cement concrete
- Fixing rodent traps at appropriate locations.
- Leftover feeds to be removed from feeding cells expeditiously.





4.4 SANITARY SECTION

4.5.1 Bannerghatta Zoo

It is proposed to purchase machineries such as one flushing equipment, 2 mini trucks in addition to the available tractor and essential gadgets to be used by sanitary staff to carry on the sanitary works more efficiently.

4.5.1.1 Solid Waste disposal

The Bannerghatta Biological Park by virtue of its vastness and the regular inflow of large number of tourists results in accumulation of large quantity of solid waste. Further the solid waste generated in the form of animal excreta like dung, droppings and stool along with the leaf litter will be collected from each animal house and heaped at a place in every section. Such accumulated solid waste from the animal houses and the visiting tourists would be approximately half tone per day. Disposal of such a huge quantity of solid waste requires adequate men and machineries. The zoo has sufficiently large numbers of sanitary staff to collect and dispose the solid waste accumulate on day to day basis. It is estimated on an average of 15 tones of solid waste generated monthly. These wastes will be conveyed to a disposal point demarcated outside the zoo premises. Solid waste will be segregated into biodegradable and non biodegradable. Biodegradable wastes will be converted into vermi compost for utilization in the lawns and gardens of the park and the surplus if any will be marketed. Non biodegradable waste will be disposed for recycling.

The principles of segregation, reuse, compost recycle will be adopted with difinet methods and methodologies to dispose the solid and liquid waste generated in the park.

4.5.1.2 Liquid Waste Management

4.5.1.2.1 Storm Water Disposal

The terrain condition of Bannerghatta Zoo area is much undulated and drains towards western direction. Since it is micro water shed area collects large quantity of rain water and storm into streams before reaching the major tanks with in BBP such as Kavalkere, Gowdanaker, Chennammanakere and Depankere etc. Some of the storm water also comes from the town limits through a common drain due to gradient and pass through the open stream runs through the zoo. The

surface water collected will be drained into local water bodies (Kavalkere tank) by creating proper open drainage on either side of the service road, visitor's path and other road network within the park.

4.5.1.2.2 Underground Drainage (UGD)

All the animal houses including existing and proposed and all other buildings located within the premises of the zoo are planned to connect with a common UGD network section wise. Depending upon the gradients and terrains conditions of the zoo, 02 locations are identified to have a collection point. Each of the collection point will be integrated with effluent treatment plant (ETP). The treated water stored in the underground sump, will be recycled for the day to day requirement like gardening, cleaning the animal houses and to use at toilet complex. Thus the efficient water management is achieved.

4.5.1.2.3 Effluent Treatment Plant (ETP)

It is planned to install 02 effluent treatment plants with a capacity of 1.00 lakh and 0.50 lakh litres respectively. In order to establish the linkage from the enclosures to each of the effluent treatment plant. The underground pipes are to be laid with facility of intermediate chambers. It is estimated that the UGD pipes of 9 inches diameter to a length of 1650 meter and 510 metres respectively to each ETP. This UGD network with effluent treatment plant will efficiently manage the liquid waste disposal accumulated on day to day basis.

4.5.2 Bannerghatta Rescue Centre

4.5.2.1 Solid Waste and liquid waste disposal

The existing UGD system for the disposal of solid and liquid waste will be upgraded by following methods

- In the lion block (L-Block) the UGD connecting animal house L-1 to L12 having 3 outlets presently. All these 03 outlets are now provided with soak pits with no treatment facilities. In order to manage this UGD system to the optimum efficiency and also to harvest the waste water all the 03 soak pits will be linked to a common treatment plant which will segregate the water and sediment. It is estimated that, on an average around **1500 litre** of waste water per day is accumulated and out of which around **800 litre** of water can be harvested through treatment. The treated water will be recycled for cleaning the animal houses and also for watering the garden around

- On a similar manner the water treatment plant will be erected in the tiger block (T-Block) which located within the **RC** complex opposite to Lion block.
- The rain water accumulated in the **RC** area will be drained into a common point and the water is harvested near L1 block. The harvested water will be reused for cleaning the animal house and gardening.

4.5.3. Life care centre

4.5.3.1 Solid Waste and liquid waste disposal

The solid and waste in the proposed life care centre will be managed through a planned UGD line and monitored as in the case of Recue Centre.

4.5.4. Butterfly Park

4.5.4.1 Solid Waste and liquid waste disposal

- Solid waste collected in Butterfly Park premises mainly of leaf litters and due to visitor's inflow. This will be collected and utilized for vermi compost.
- Strom water runoff at and around Butterfly Park will be collected in a tank and will be used for thermo regulation of main dome and also to recharge the existing bore wells.

4.6 Commissary Section

The commissary section is most important in the management of zoos and parks as the kind and quality of food provided to the animals is directly proportional to the health and life span of the animals. Presently the feed and fodder procurement to all the units of park is procured centrally from the Executive Directors office on the basis of e-procurement. The storage and distribution to all the three units is being monitored by the Range forest officer, Zoo Range. As the food distribution, delivery, receipts and feeding is monitored by one officer, there is no control over the quality and quantity of the feed and fodder being supplied to the animals.

Further the indent, procurement, receipt, storage and daily issue is being monitored by the zoo range officer on behalf of the other unit officers and hence there is no control over the quality and quantity of feed and fodder supplied to the animals of other units like safari, rescue centre and Butterfly Park. All the units such as Zoo, Safari and Rescue center are growing at very faster rate as the number of animals are being added up and multiplied every year. Hence, over all monitoring of the store is becoming increasingly complex and warrants for the bifurcation. Therefore it is proposed to have **three different stores in the same**

storage complex for each of the units and they shall be under the control of respective Range Forest Officers. The indent, procurement, receipt, storage and daily issue and also the food distribution, delivery, receipt and feeding will be monitored by the respective Range Forest Officer's. Thereby the quantity, quality of feed and fodder supply can be ensured. Further the supply and distribution of food to all the animals can be effectively monitored.

4.6.1 Up gradation of present buildings

The present building of the storage will be upgraded by providing three independent storage facilities for each of the range. The storage facilities for Bannerghatta Biological Park was created for the first time during the year 2012 by building a new storage and kitchen facilities within the Zoo premises. In absence of storage facilities within the Zoo the food articles were supplied on day to day basis by the feed supplier and the same used to go to the animal enclosure without any proper check and accountability. There was no system of proper receipt and distribution of food articles by the officers in charge of the units and also by the Zoo veterinarian. It was in order to rationalize the indent of food, storage and distribution facilities was created by constructing an exclusive building during 2012 for the first time.

Huge quantity of raw food like rice, horse gram, jaggary and coconuts were given to elephants on daily basis. Normally the captive elephants are fed with cooked food in the forest elephant camps and other Zoos. Since there was no kitchen and its infrastructural facilities to cook the food, the elephants were fed with raw food from the inception of the Zoo. Therefore, it was decided to construct a kitchen connected with biogas facilities. During 2011-12, this kitchen block was constructed for the first time in BBP to take care of the dietary needs of larger animals to ensure the quality and quantity.

The Prepared food articles before they are delivered to animal enclosures are exposed for clinical examination on day to day basis. The food certification regarding the fitness for consumption both in quality and quantity are being certified by the Zoo veterinarians with the assistance of concerned range forest officers.

4.6.2 Up gradation of food storage facilities

There is an immediate need to upgrade the existing storage facilities, because the space availability is very limited in the existing building. Huge

quantity of food materials like cereals, grains and number of articles are unable to accommodate in the existing store procured on monthly indent. Further separation of range wise storage facilities is also required, as the indent, supply and distribution required to be managed range wise independently. It is proposed to construct additional facilities of 03 independent store rooms in the existing storage yard. Each of the range will maintain the stock of feed and fodder and general supplies pertains to their range.

4.6.3 Up gradation of food transport system

The food transport system is not well equipped in the present management. The Zoo, Safari and Rescue centre are located far away from each other and the food articles are to be supplied from the Zoo premises. Although, there is a small van dedicated for the supply of feed and fodder to all these 03 units, the quantum of work is more and very difficult to complete in the limited time. Therefore it is proposed to purchase a medium sized food van and deploy for the food transportation. Further distribution, packing, loading and offloading the food articles at various places in the park require the supporting staff of at least 02 members to support the existing system.

4.6.4 Meet and other food article inspection

- All the 03 range forest officers in charge of Zoo, Safari and Rescue centre respectively will visit the store and kitchen at 9.30 am in the morning to personally see and supervise the food distribution to the animals under their control. They will also ensure the quality and quantity as per the diet chart sanctioned by the executive director.
- The respective range forest officer shall procure the food containers to each animal house and preferably to each animal. This facility will not only ensure the food supply to every animal house and every animal, it will also give the general idea to the keeper about the quantity of the food likely to be given to each of the animal at his command.
- The Zoo doctor should visit the storage and kitchen every day at **9.30 am** and inspect the food and certify the quality and also the quantity before distributing to the animal houses.
- The Range forest officers, wildlife biologist and Zoo veterinarian along with the deputy director convene a meeting in the month of April every year and review

the feed schedule of every animal housed in the park and fix the quantity of food and recommend to the Executive director for sanction. The executive director shall place this feed schedule before the **health monitoring committee** and by taking the opinion of the health monitoring committee shall sanction the food schedule for each animal for the year.

4.7 HORTICULTURE SECTION

4.7.1 landscape planning

The mandate of Central Zoo Authority is to maintain the 30% of the total area of the park under green cover. However the green coverage available in the form of natural vegetation is much more than the CZA stipulation. The vacant spaces available on either side of the pathways, visitors circulation path and around animal enclosures will be converted into greenery, by planting suitable flowering and garden plants. The overall landscape of the zoo and Butterfly Park including the parking area will be developed with a comprehensive planning depending upon the terrain condition and water source. Importance will be given to cover more area under lawns and small gardens where visitors can rest and relax. All the green area marked on the approved Master Layout Plan will be converted into a suitable gardens suits the landscape.

The large extent of open rocks available in the zoo and Butterfly Park area will be developed into rock garden by providing suitable sitting places, pergolas and drinking water points. The ponds created out of quarrying the area such as Bandekere and the other 02 tanks located within the zoo such as Benekanakere and Kavalkere will be developed into aesthetic spots where visitors can have a stroll and relax.

4.7.2 Other Infrastructure

4.7.2.1 Development of horticulture nursery

The total area of Bannerghatta Zoo, Butterfly Park and Parking area is around 60.00 Ha. Out of which the lawns and gardens and parks are to be created in 20.00 Ha of area and maintained in perpetuity to restore the aesthetic beauty of the area. These demands for regular planting, replacement and removals of annuals. Unless park has the dedicated nursery, the management of garden activity will be paralyzed. Therefore there is a necessity to raise and maintain the lawns, flower plant, hedge plants and aesthetic tree plants in the

horticulture nursery. Therefore it is proposed to develop a horticulture nursery near Doddabandekere

4.7.2.2 Supporting staff

At present the park doesn't have horticulture wing and horticulture officer. This being the Biological Park, the priority needs to be given to development of park. Animal enclosure enrichment is part of the garden activity. This kind of activity cannot be meaningfully carried out without a trained and qualified personal. Therefore there is a necessity to establish an exclusive set up called Horticulture Section headed by a horticulture officer with a supporting staff.

The Governing Council of Zoo Authority of Karnataka have approved Cadre and Recruitment Rules for Bannerghatta Biological Park wherein an approval is given to have an Assistant Horticulture Officer with 03 horticulture assistant and 04 head gardeners and 08 gardeners. Efforts will be made to outsource the staff as approved till the regular appointment is made, as the horticulture activities are to be carried out on priority.

4.8 SECURITY SECTION

The entire BBP area except a small length of around 2 to 3 kms at Y.M.L Sharma gate has been barricaded with stone compound wall. Therefore the boundary has been totally demarcated and consolidated towards agricultural land and villages. However BBP has a common boundary with BNP passing through the forest which has been demarcated on the ground for the purpose of management understanding. However Government of Karnataka is yet to notify the boundary description through a government order.

Although the stone compound wall is very strong and preventing the entry of wild animals into the area of Biological Park, at some places elephant herds do cross over the compound wall by taking advantage of the terrain condition. At some places the elephant have damaged the compound wall and crossed over to the biological park area and damaged the animal enclosure apart from picking up conflicts with Zoo animals during night time. Therefore it is necessary to provide solar power fence over the compound wall to prevent the entry of all wild animals including elephants effectively

4.8.1 Eviction of illegal occupant

A person by name Suresh is a original land owner living in this area for several years. The land which was under his ownership has been legally acquired by the competent authorities of revenue dept and he has been paid with eligible land compensation. However having agreed to the acquisition proceedings and having taken the land compensation he has not vacated the area of 3.18 acres and illegally staying over there. The land of 3.18 acres is lying in the mid of the park in between rescue centre and butterfly park. Until 2011 and 2012 he was moving into his area passing through Zoo and Butterfly Park as there was no compound wall in existence. It was during early part of the year 2012 and 2013 the peripheral boundary of Zoo towards main entrance plaza and Byrappanalli was consolidated by putting up stone wall compound and all the illegal entry into the park was totally prevented including the entry of the said illegal occupant. Further he was served with a notice to vacate the occupation of 3.18 acres of area which is required for various development purpose of the park. However the illegal occupant has not yet vacated by quoting some references from the local court from Anekal.

There is a need to pursue the court and evict this illegal occupant as he is causing inconvenience to the park authorities by illegally entering into the biological park to have an access to occupied area before and after Zoo timings. Since the biological park itself is located within the national park area, his occupation is also illegal as he has not obtained the permission from the Chief Wildlife Warden who is the controlling authority as per as management of national park is concerned and as per the provision of Wildlife (Protection) Act, 1972. Further the said illegal occupant has no right to further continue his stay as the BBP has already paid his land compensation. Since he is fighting in the court for higher compensation he can continue to do so even after vacating the place, as he has no issue with reference to land acquisition. His contention of higher compensation has to be addressed by revenue authorities. Therefore the eviction proceedings should be initiated against this occupant at an early date.

4.8.2 Up gradation of security gates

Security is another aspect of protection and this can be done effectively by erecting the security gates with electronic surveillance system at all the entry and exit points. There are totally 5 gates located at different places within the Zoo premises and the details of these gates is as follows,

- i. Old Zoo entrance gate
- ii. New gate at entrance plaza
- iii. Parking entry gate
- iv. Safari entry gate at Butterfly Park
- v. Kavalkere Gate.

All these gates needs proper up gradation by providing effective gate monitoring system and electronic surveillance with CC camera. All these gates be provided with men with operation facilities and wireless set for communication. The Safari entrance gate, Visitors entry Gate and the Parking gate be provided with HD cameras with CCTV facilities to record and monitor entry and exit of vehicles and peoples during the visiting hours. The night watch and ward is must in these gates to monitor the gates during night time.

The old Zoo entry gate and Kavalkere gate should be closed after 8.30 pm for the entry of people who presently resides inside the Zoo premises. No Persons be allowed at Kavalkere gate after 8.30 pm as the wild elephant use this road for moving around.

4.8.3 Deployment of Staff

The security personnel need to be deployed at all important places such as, ticket counters, entry and exit gate, Parking area restaurants and shops. To have an efficient security monitoring system, security personnel from the private contract agency, Park staff and Ex army/ ex-police personnel be engaged and deployed. When there is a mixture of 3 different personnel there shall be more transparency in their acts and deeds. Therefore it is always advisable to mix and use these people. It is estimated that around 40 security personnel are required to monitor the security system of all the units of Bannerghatta Biological Park. It is also proposed to have the following staff pattern,

- Chief Security officer-1
- Security officers-3
- Security supervisors-4
- Security guards- 32

4.8.3.1 Security Deployment Plan

4.8.3.1.1 Chief security officer

Chief security officer will be the head of the security force will function in the security office provided at new visitor's gate. He is responsible for assuring overall protection to the Park and its properties. He would control monitor and deploy the staff, sanction leaves make alternative arrangement etc, and directly reports to the Executive Director. Chief security officer will be of the rank of Deputy super indent of police/commandant.

4.8.3.1.2 Security officers

Security officers will be of the rank of retired inspectors of police or assistant commandants. They will be working directly under the Chief security officer and control their area by providing adequate protection. One security officer will be working at the old Zoo entrance covering the entire Zoo area, New entrance Plaza and main visitors entry gate.

Another security officer will sit and function from safari entrance gate at Butterfly Park and control and monitor the security at Butterfly Park, Safari bus boarding point, parking area and Rescue Centre.

The Third security officer will be controlling and monitoring the security during the night time in the jurisdictions covered by the security officers 1 and 2.

4.8.3.1.3 Security Supervisors

Each security officer will have one security supervisor for their assistance and third security supervisor will be monitoring the ticket counter, new entrance plaza and safari visitors' shelter area. The 4th security super visor will be conducting night duties by assisting to the night security officers

4.8.3.1.4 Security Guards

Out of 32 security guards 24 are deployed to look after the security duties during the day time and other 8 member will look after the security duties during nighttime.

4.8.4 Intelligence gathering

There is no mechanism of gathering the information to know about the infiltration of anti-social elements into the biological park. Further the revenue collections and entry and exits at the main gate need to be monitored as some of the mischief mongers try to play a harmful role to earn illegal money by misusing the tourists and system. To have a control over this kind of mischievous activities the management needs to mobilize the right information at right time this is possible only by deploying confidential staff to gather the intelligence and update the management. Therefore it is proposed to hire 2 retired police personnel of the rank of inspectors to monitor the intelligence gathering network of the park.

4.8.5 Patrolling

The most important part of security is to provide protection by conducting regular patrolling in the area. It is proposed to conduct patrolling using electronic security patrol monitoring system by selecting vulnerable points within the park limits. This patrolling system is called as '**tech-beat**'. This system comes with a set of tags, readers, PC interface, charger and required software. After selecting points for patrolling the electronic cards which are the size of normal visiting cards would be implanted on the walls, doors and even embedded with a layer of concrete or any other non metallic surface. There are 'fit and forget' electronic devices which require neither batteries nor any kind of maintenance. they are whether proof, shock proof, unbreakable, compact and also cost effective.

The moment the patrolling person swipes the card using '**Palm sized**' reader the timing and date would be got recorded on the reader. The information will later be red on a computer and a print out taken. This kind of full proof patrolling will not only enhance the efficiency but keeps the system always alert and guarded.





4.8 ZOO ENGINEERING SECTION

Zoo Engineering Section is playing pivotal role in establishing well planned and designed infrastructures like animal housing facilities, roads, paths and other civic amenities. The zoo architecture and landscape is an integral part of zoo management which deals in providing a good habitat to animals housed in captivity. As the animal enclosures are important for the management of animals more meaningfully, the other civic facilities like buildings for various administrative reasons are also equally importance in the context of zoo management. Therefore the constructions of buildings are considered as one of the prerequisites in the zoo management and hence the following buildings are identified for construction during the plan period.

4.9.1 Engineering Supporting staff

During the plan period, large number of construction activities is to be carried out. Most of these buildings and enclosures are highly skilled and technical. Unless an Engineer knows about zoo architect and zoo landscape and fair knowledge animals and their habitat, the engineering works cannot be carried out meaningfully. Therefore, it's just and fair to upgrade the existing post Assistant Engineer in the zoo to the level of Assistant Executive Engineer. Further there is a need of subdivision in the zoo till the master plan activities are carried out.

Alternatively, any other government agencies such as Karnataka rural Infra Structure Development Corporation Ltd may be involved in the development work. There by continuity of work knowledge will be there and the works can be completed as expected and within the stipulated time.

The proposed staff structure of engineering section would be,

1. Assistant Executive Engineer
2. Assistant Engineer
3. Work inspector (outsource)
4. Electrician
5. Plumber

4.9.2 Buildings

4.9.2.1 Administrative Block

Since the inception of this park no attempts was made to construct an exclusive building for running the park administration. The expansion of park activities in multidimensional way like conservation, education, extension, research etc., there is an imminent need to have a comprehensive building for running park office administration. The site of the size 200 x 200 feet has been identified on the bank of Bandekere opposite to safari boarding point and marked on the Master Layout Plan and financial resources

are at the command of park authorities to construct the same. An architecturally designed building with modern infrastructure will be constructed during the plan period.

4.9.2.2 Zoo hospital complex

It is planned to build **Hi-Tech Zoo Hospital** with modern facilities within the premises of zoo. An area of 04 acres has been identified and marked on the approved layout plan in the north-west corner of the zoo opposite to **store complex**. The different units to be constructed in this complex are **Hi-tech zoo hospital, inpatient ward, quarantine facility, disease diagnostic laboratory, animal nursery** etc., The detailed plan of Hi-Tech veterinary complex is prepared in consultation with Veterinary Collage, Hebbal, Bangalore authorities.

4.9.3 Roads

4.9.3.1 Zoo Roads

4.9.3.1.1 Visitors circulation path

In the approved zoo layout plan of Bannerghatta Zoo, a visitor's circulation path to a length of 2.7 km is proposed to develop. This path needs to be developed by keeping the kind of visitor's uses the path. This path will be used by all aged visitors including physically challenged. Therefore the kind of road formation contemplated should fulfill the requirement of all type of visitors. Hence it is proposed to develop the entire length of visitor's circulation path by adopting suitable method to merge with the area. Width of the road to its full length will be of about 20 feet.

4.9.3.1.2 Service Road

In the approved Master Layout Plan of Bannerghatta Zoo, there is a plan to form and develop service road to a length of 2.25 km. This road will be exclusively used for transport of feed and fodder, shifting of animals, construction materials etc , where the visitor's entry is totally prohibited. The width of the road will of 12 feet to its full length. This will be developed during the plan period.

4.9.3.2 Safari Roads

4.9.3.2.1 Safari route

As the visitor circulation path in the zoo, the safari circulation path is also defined. This road is called as safari route having a total length of 11. 50 km starting from safari entrance Gate at Butterfly Park through Gajapath road encompass on all the safaris till reach back at the entry point. The existing length measuring around 8.30 km will be

upgraded and the new roads in the proposed safaris will be formed and developed to facilitate for the tireless and smooth safari.

4.9.3.2.2 Service roads in safaris

In addition to the main safari road each safari has the service road network which is approximately to a length of 10 km. These roads were earlier used for various purposes like supply of feed, shifting animals, conveyance of construction materials apart from management purpose. It is planned to have an alternate circuit in all the safaris. When the regular route is affected due to exigencies and administrative reasons this alternate road can be used. Therefore, these roads also needs the up gradation and will be done during the plan period.

4.9.3.3 Water supply

➤ Visitors

Each drinking water facility proposed in the zoo will have 1000 litre capacity storage tank. Storage tank will receive the water from the bore wells. Filter equipments will be installed at every drinking water facility. Visitors will get the filtered drinking water for their requirement.

➤ Animal

The water distribution from the storage tank for drinking purpose will be through a separate line linked to each animal house and also enclosure to guarantee the drinking water for all the animals housed in zoo, safari and rescue centre. Further, the water required for cleaning the animal house, bathing the animals and to wallow pools in the enclosures will be given through a different waterline as the water from the recycled source has been planned to use.

4.9.3.3.1 Development of water resources

- All the bore wells dug within the imits of Bannerghatta Biological Park will be planned to rejuvenate through underground recharge mechanism. In order to conserve and reuse rain water, the facilities of rain water harvesting on the roof and surface will be adopted.
- All the open tanks in the safaris and within the ambit of park will be developed by desilting, bund consolidation and creating shoulder channels to increase the water impounding capacity.

4.9.3.4 New water supply project

➤ Doddannakere

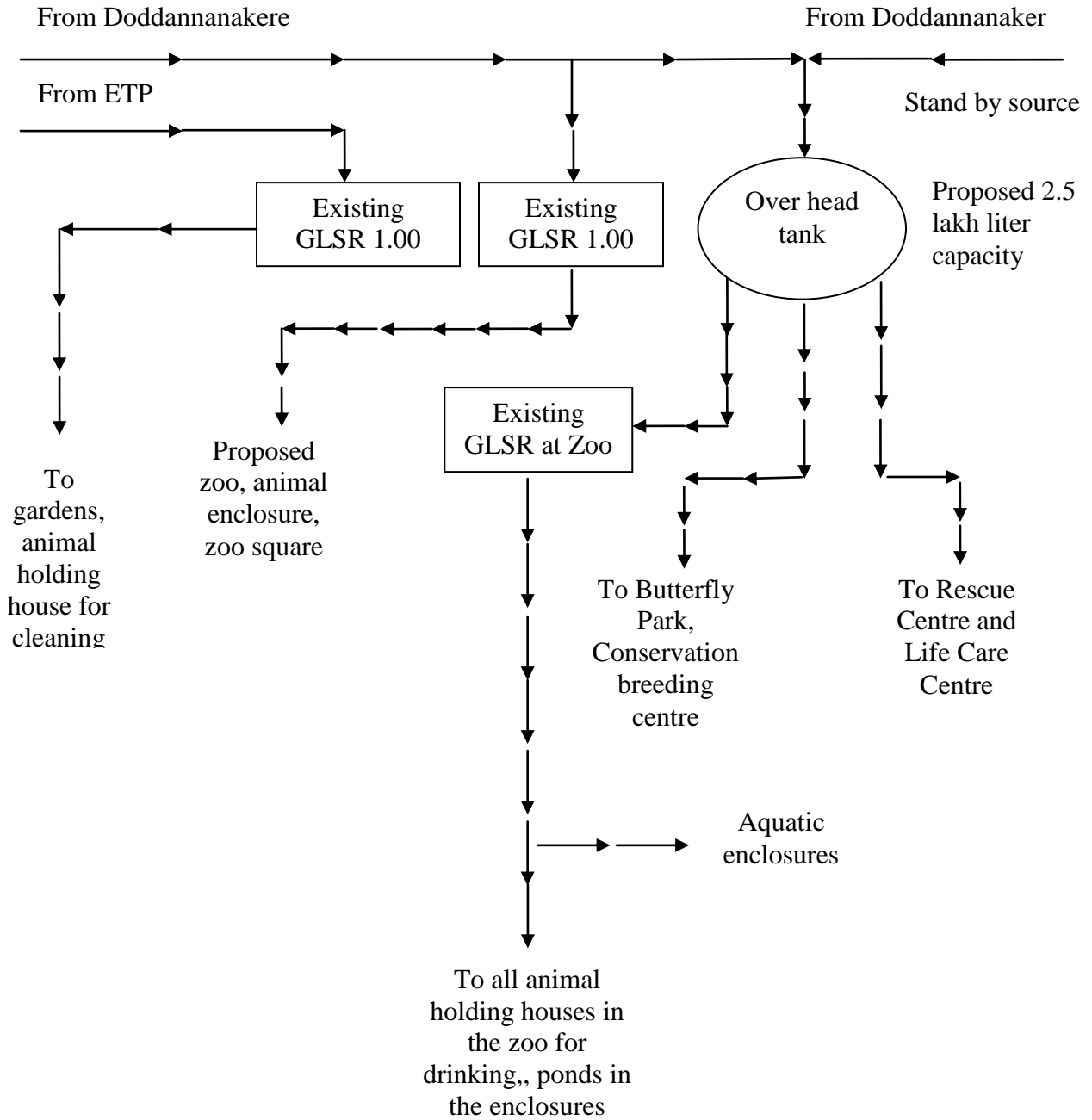
As already explained in the appraisal, water is a regulating factor and basic requirements for the management of zoo, safari and rescue centre. From the available bore well sources, the park is getting 45,000 litres as against present demand of 2.50 lakhs litre/day. Further the demand will reach upto 6.00 lakhs litres / day by the mid of planned period due to expansion of zoo, safari, rescue centre, conservation breeding centre and also due to ascending rate of number of visitors.

Now it is experienced in the park that, the underground source of water is being depleted. Therefore, it is planned to draw water from Doddannakere Tank (perennial source) located at about 04 km away from the park on western side (near Hakkipikki colony). Doddannakere tank is in the jurisdiction of National Park. Detailed hydraulic design, survey work has already been carried out. The proposal is submitted to Principal Chief Conservator of Forests (Wildlife) and requested for permission to utilize the tank water and also for the pipe line length of about 310m will have to be laid in the National Park area. Since the proposed tank is a guaranteed source of water, the project will be implemented within the plan period as soon as the permission is obtained from the Principal Chief Conservator of Forests (Wildlife). It is planned to lift 5 lakhs liters of water / day from Doddannakere tank.

Bannerghatta zoo is having aquatic enclosures for the animals like Hippopotamus, aviary, crocodile. These animals require huge quantity of water. Considering the anticipated scarcity of water during summer, storm water can be stored in the tank called Doddabandekere which is located about 1.1 km in the north-east direction of the zoo, the same will be utilized.

At present, zoo has three water storage tanks of 2 nos of 1.00 lakh litres each near Butterfly Park and 1 no. of 50,000 liters capacity in the existing zoo premises. One more natural mearing storage tank of 2.50 lakhs liters capacity will be constructed during the plan period near existing storage tanks at Butterfly Park. The storage capacity will be increased to 5.00 lakhs will be suffice the demand during plan period in addition to working bore wells.

Water Supply Distribution during Plan Period



(**Note:** Existing Bore wells will be directly connected to 9 number of drinking water facilities)

4.9.4 Staff Residential Facilities

The zoo Authority of Karnataka in its 124th Governing Council Meeting has resolved to demolish the residential facilities being used by some of the staff. This residential facility was created around 30 years ago and now falling within the ambit of zoo. As per the provisions of Wildlife (Protection) Act, 1972 no recognized zoo authorised to have any residential accommodation within the limits of zoo. Further the Central Zoo Authority has approved to construct the new zoo hospital complex by demolishing the residential facilities provided to the staff. Therefore it is proposed to demolish all the existing residential facilities except the facilities provided to resident doctor and Deputy Director.

Efforts are being made to find out suitable area to establish the quarters within the park limit but away from the existing zoo, safari and Butterfly Park limits. Once the suitable area is identified, needed approval will be obtained from the competent authorities to construct the residential facilities to the staff and executives.

4.10 GENERAL ADMINISTRATION

The BBP being a society is a non-commercial organization formed with objectives of protection, preservation and promotion of wildlife in ex-situ. It is headed by the Executive Director who is assisted by Assistant Conservator of Forests, Range Forest Officers, Veterinarians, Assistant Engineer and other management staffs

Though the Bannerghatta Biological Park is part of ZAK registered under the Karnataka Societies Registration Act, 1960, did not have its own Cadre and Recruitment Rules. However the Cadre and Recruitment Rules has been approved by the Governing Council, zoo Authority of Karnataka

The existing staff pattern of the park largely comprises of the following category of staff and depending on the nature of job associated to each worker, they are classified into following types

Sl. No.	Staff Pattern	Staff
1	Management Staff	Executive Director Deputy Director Range Forest Officers Superintendents Office Assistants

2	Animal Care Staff	Range Forest Officer Deputy Range Forest Officer Forests Guards Forest Watchers Animal keepers Store keeper Kitchen In-charge staff
3	Veterinary Care staff	Deputy Director (A.H & V.S) Assistant Director (AH&VS) Veterinary Officers Pathologist Paramedical staff
4	Development and Maintenance Staff	Zoo Engineer Electrician Plumber Pump Operator Malies Sweepers
5	Transport staff	Drivers

4.10.1 Inadequacies to be addressed

4.10.1.1 Daily Report System

At present the veterinary in-charge of the zoo is submitting the clinical observation report to the Executive Director but there is no valid system of daily report from keeper onwards to the management head. To strengthen the effective daily report system the Range Forest Officer in charge of various units prepares the daily report based on the observations made by the subordinate staff right from animal keeper and submitted to the Deputy Director. The Deputy Director will examine the reports received from units including the clinical report before forenoon. The Executive Director may be informed of any important, serious, emergency occurrences that would require the intervention of Executive Director. All the daily report from each administrative unit shall be compiled on a weekly basis and reviewed once in a week to monitor the ailing, sick, injured, pregnant or locating animals for their better care

4.10.1.2 Interactive Meeting

Interaction among the staff members both field and office is essential and necessary to ensure the efficient administration. It is therefore proposed that a brief meeting may be arranged every day before calling off the day. It is also suggested to have a monthly meeting of each unit staff members to exchange their views on improving the management, animal care, visitors facility, animal feeding, office procedure etc. Minutes of monthly meetings may be drawn to ensure the follow up action.

4.10.1.3 Zoo Administrative Manual

It is proposed to bring out zoo administrative manual to ensure the timing of employees in working hours, close and opening the units, cleaning, monitoring the sick animal. Through a well defined manual all the responsibility of officers and officials in the various capacities can be regulated. The manual will also specify different works and responsibilities of different category of personals

4.10.1.4 Staff Welfare Measures

Presently there are enormous inadequacies in the staff welfare. Almost 80% of the total staff are working on outsource basis. Their wages and perks are not comensurating to the work delivered. Their service is not guaranteed and they are not getting any assured allowances to the risk they are being exposed. Their job permanency is the only solution to overcome this inadequacy. Therefore there has to be a mechanism to regularize their job by duly considering their length of service, professional expertise and commitment in the job.

4.10.1.5 Health Care of Zoo Staff

The staff members more particularly the animal keepers who spend maximum time in the animal enclosures are exposed to the risk of diseases. The periodical medical check up to the staff should be made mandatory at least once a year. The medical expenses and the expenditures towards these kinds of test and checkup should be borne by the institution. Whenever the injuries caused to the staff due to animal attack or while carrying out the authorised works in the park limits the entire medical expenses has to be borne by the park. Apart from the compensation for the losses.



Medical check up for employees

4.10.1.6 Common Room Facilities

The animal keepers at present do not have any place to change their dress and freshen up while on duty. They also do not have any place to have lunch. Further to spend time at their leisure during the duty break no recreational facilities are provided. Therefore it is proposed to have a common room facility, where an indoor game facility like carom, chess etc. is provided.

4.10.1.7 Supply of sanitary kit

All the animal keepers are invariably involved in cleaning of enclosures and sanitizing the solid and liquid waste generated in the enclosures. As most of the time they are involved cleaning in the bare foot and hand they are likely to get affected with infections and diseases. Therefore, it is proposed to provide sanitary kit having hand gloves, gum boots, germicides like detol and soap.

4.10.1.8 Rewards

The nature of duties expected of the animal keepers and other staff involves risk to their life and health. Despite of many constraints they are compelled to perform their duties in the larger interest of the captive animals and organization. Encouraging such staff with any kind of incentive will reward back in the form of good work. Therefore, it is

proposed to institute rewards to those who are adjudged to be the best worker in a year. A suitable case reward is always desirable and which will be much of help to them financially. The selection of the best worker in the field of animal management, enclosures upkeep, disease monitoring, landscape gardening etc., can be adjudged by a committee headed by the Deputy Director, concerned Unit Officers and a member from among wildlife enthusiasts.

4.10.2 Directorate Building and Infrastructure

The present office building of the Executive Director is very small and congested. Further it does not have adequate infrastructural facilities to run the office administration efficiently. All the important sections such as zoo administration, zoo accounting, zoo management are housed in the small building which is leading to overcrowding of officials. There is no place designated for the visitors coming in a larger group to attend the official work in the Executive Director office. Therefore, it is proposed to construct a spacious building with good infrastructural facilities outside the zoo limits in front of parking stand.

4.10.3 Vehicles

Presently the unit officers of Zoo Rage, Butterfly Park and Safari are not having official vehicle to carryout the duties and responsibilities efficiently. Therefore, it is proposed to provide 03 jeeps to each of this unit to carry out their day to day job efficiently.

The Butterfly Park has to have an exclusive field vehicle to outsource the butterflies and host plants collect them from the field for breeding and display. As there is no vehicle provided for this purpose, the collection of different species and breeding them for the display of public is affected.

4.11 RESEARCH SECTION

The ex-situ conservation facility developed over the year did not yield any considerable research output due to lack of concerted efforts by the zoo managers. The ecological and biological information on the species housed in captivity are must to consolidate their management strategy. The zoos and parks have always being, and continued to be great potential source of basic scientific knowledge. All zoos are encouraged to make their animal collection available for research endeavor.

The Ex-situ population requires extension scientific knowledge in a wild range of biological and veterinary discipline. Although enough knowledge accumulated over the past still more needs to be acquired through scientific research.

Research is tool to assist in doing any activity better. Doing this systematically should be implicit in any zoo managers thought process. Research should not be regarded as an extra duty to day to day work.

In Bannerghatta Biological Park there is no independent Biologist to take care of this aspect. This is absolutely essential for a zoo of this size to have a full-fledged research wing or a Researcher attached to existing mechanism to carry out research in pure and applied biological science including small population's biology, animal welfare, wildlife medicine, physiology, nutrition, pathology behaviour, reproductive biology, breeding ecology, genetics, evolution and taxonomy.

4.11.1 Creation of research Centre

In the Indian scenario no zoo and park is having separate research wing to undertake research on identified problems of zoo management like , Animal behaviour, animal ecology, physiology, genetics, reproductive biology, enclosure enrichment and captive breeding techniques etc., It is essential to have a research for conservation breeding and scientific management of endangered animals in an exclusive research centre.

The Bannerghatta Biological Park has identified 26.45 ha of area abutting to the Zoo and Butterfly Park for establishing conservation breeding and research centre. The Central Zoo Authority has approved the master lay out plan for this activity.

The identified objectives of the research centre will be as follows.

- i. To study and standardize the carrying capacity, habitat enrichment of various animals housed in the zoo, safari and rescue centre.

- ii. To study and standardize the techniques of important species housed in the zoo
- iii. To study the nutrition, psychology and animal ethnology of the species housed in the park
- iv. Study on the captive breeding of selected and locally endangered animal species housed in the zoo
- v. To conduct research and standardize the techniques for infant care, hand rearing, orphan management and their nursing
- vi. To study the DNA finger printing, artificial insemination and cryo preservation on some of the selected species.
- vii. To standardize physical and chemical capture techniques for safe translocation and transportation of endangered species
- viii. To study on species specific reintroduction programme of endangered species.
- ix. To study on the epidemic management and to standardize the prophylactic treatment
- x. To study and standardize the techniques on clinical management important endangered species

4.11.2 Staff Support

In order to achieve the above objectives a scientist in the cadre of Grade - E or an in-service officer from the department of forests with a suitable qualification, experience and research background is needed. If a qualified serving officer is available, he may be appointed as incharge of research. Retired IFS officers with qualification or Scientist can be out sourced. Further to involve and assist more meaningfully in the research aspects 02 scientist of the grade of Scientist – D or an in-service officer from the department of forests, 02 Research Associates and 02 research fellows are needed under the relevant scale of University Grand Commission (UGC). It also proposed to have collaboration with the animal science institutions such as IAH&VB, University of Veterinary Science and Indian Institute of Science or even from any qualified institution outside the country.

The other general subject immediately requires the attention of researchers are,

4.11.2.1 Research priorities

- i. **Animal Nutrition:** It is essential to assist the carbohydrate protein and mineral requirement of animal and match with the present food being supplied to standardize the kind of feed and fodder seasonally to the animals.
- ii. **Animal Landscape:** The environment provided to the animal in the zoo must be in relation to the natural surroundings where the animal typically lives Based on those facts there needs to be manipulation of landscape in order to enrich the facilities.
- iii. **Animal Husbandry:** All the animal provided with housing facility should have shelters, purchase, withdrawal areas wallows, to display their natural behaviour. Research on the above line needed to ensure their survival in captivity and in wild.
- iv. **Animal Ecology:** The ecological studies in the simulated habitat in zoo and that in the wilderness can revealed the impact of habitat on the animals. This kind of impact study will provides scope to assist the manager to extend the conducive environment to animals.

4.12 Education Section

Education is a central role of all zoos and parks and should thus be the part of their organizational strategy. The zoo education is holistic discipline targeted at visitors, staff and the wider community. The educational philosophy of zoos and park should incorporate the principles of environmental education and education for sustainability. This may be referred to as conservation education.

4.12.1 Up gradation of Education Facilities

Although, there is no comprehensive education facility and network created within BBP, there is a tremendous scope to do the same. The existing WADDL laboratory will be considered as Zoo Education Centre after the WADDL is shifted to Hi-tech zoo hospital. The present day zoo education is to impart information on flora and fauna and their interdependent.

Research and education are the twin objectives which aim to achieve ex-situ conservation of endangered species for multiplication and to prevent them from extension. The large collection of living animals in zoo, safari, rescue centre and Butterfly Park will act as exhibit and demonstration material for educating all sections of the society. The Bannerghatta Biological Park will take up the following education oriented activities in order to address the inadequacies

4.12.2 Informal Education

All the animal exhibits in the zoo, safari Butterfly Park and Rescue Centre will be provided with well designed and signage boards having require information on animal species, geographical distribution, gestation, longevity etc. This kind of interpretive signage boards with pictorial guide will be displayed in the park. Interactive and interpretive boards on “leaping distance” of selected animals will be placed at important points.

4.12.3. Zoo Outreach

The wildlife conservation and awareness programmes will be organized in the neighboring schools and colleges to inculcate the awareness of conservation in the minds schools and college students. The various wildlife activities like exhibition, quiz, painting competition will be organized in the selected schools and colleges on regular basis. Other wildlife competitions for amatures like seminars, workshops and photography will be organized at the college and institution to involve the youths for the cause of conservation.

4.12.4 Zoo Youth Club

It is proposed to constitute a Youth Club in the ambit of Bannerghatta Biological Park. The interested students will be allowed to enroll as members and they will be allowed to meaningfully involve in all the education and conservation oriented activities of the park. It is also proposed to involve Zoo Youth Club members for volunteer services in upkeep of animal enclosures, feeding and management of sick animals etc. Since the Bannerghatta Biological Park located within the city limit there is a tremendous scope to constitute Zoo Youth Club.

4.12.5 School Education Programme

It is proposed to approach the schools and colleges run by government and private societies to bring students and teachers to the park to impart knowledge on wildlife conservation. The More interested groups will be provided with a well structured talk through power point presentation on wildlife conservation.

4.12.6 Special Environmental Education Programme

All important environmental festivals days like World Forest Day, World Environment Day, World Earth Day and Wildlife Week will be celebrated involving school and college students. On these days conservation talks will be organized involving professionals. Other activities like Wildlife Quiz, Essay Writing Competition, Elocution and Painting competition will be organized to attract the student community.

4.12.7 Teachers Training Programme

The teachers disseminate the conservation knowledge to the students in a more appropriate manner. The teachers of Primary, Secondary and Higher Secondary Schools will be encouraged to participate through wide publicity and awareness campaign. The state education department will be approached to make this kind of programme compulsory for the teacher teaches the science.

4.12.8 Zoo Volunteers Programme

Under this programme, it is planned to enroll students willing to spare their time for helping in the management of park. The zoo volunteers will be involved to assist in the zoo education, sanitation and security of zoo animals. The retired teachers and civil officers will be encouraged to enroll in this programme and their services will be utilized over a long period. Admissible perks and honorarium will be paid for this category depending upon the contribution made by the volunteers for imparting the zoo education.

4.12.9 Zoo internship Training

To bring love and affection among the interested individuals on wild animals it is proposed to have an internship training annually. The main idea of providing this training to create a buffer reserve of **animal attendants**, who are interested to serve the zoos and parks. On prior intimation the selected candidates will be called and a training course of one week will be organized. This course will be planned as a residential course wherein the participants are exposed for animal house cleaning, watering, feed preparation and animal feeding. This kind of annual training will create the buffer reserve of trained human resource and they can be used at the time of crisis.

4.12.10 Nature Interpretation and Museum of Natural History

The government of Karnataka accorded sanction to use the space available on the 1st floor of BMTC building complex for conduction nature interpretation activities. It is mandatory on the part of BMTC authorities to support for this kind of activities as a condition while sparing the 2 acres of park area for construction of BMTC complex. It is proposed to develop Nature Interpretation Center and Museum for Natural History for the

benefits of visitors. This centre will serve as a education centre to communicate the traditional knowledge on wildlife and its importance for conservation and the role of every citizen to conserve the natural assets like forest and wildlife. In the proposed Museum of Natural History, the pictorial depiction of animal evaluation and different modules of the animals already extinct will also be displayed for the benefit of tourists.

4.12.11 Zoo Library

There is no facility of reading for the visitors who are likely to spend their time leisurely in the park. Further there are no adequate reference books available in the stock of zoo to read and understand about crucial management issues for the benefit of managers. Therefore there is an immediate necessity to establish a zoo library on the 1st floor of BMTC complex. It is proposed to establish zoo library by procuring the books, periodical, journals and magazines on forests, wildlife and zoo management.

4.13 BOTANICAL PARK

The area of Bannerghatta zoo range is 159.14 Ha. Out of which the net area demarcated for the establishment of zoo is 41.08 Ha. The balance 110.06 Ha is the natural forest area with rocky outcrops lying towards western and north-western of Bannerghatta Zoo. This area is supported with very good tree cover and bamboo brakes with few water bodies. The topography of the area is undulated and soil is very shallow. Therefore, the water holding capacity of the soil is minimal and hence the area remains dry for longer period of the year. The area also has the presence of the large extent of old eucalyptus plantation

Depending upon the soil quality and terrain condition, it is proposed to develop Biodiversity Park, Religious garden, Medicine plant garden, Arboretum and Orchidarium. The details with extent is stated as follows below.

Sl.No	Name	Area in Hectare
1	Biodiversity Park	43.35
2	Suvarnamukhi Religious Garden	2.56
3	Medicinal Plant Garden	10.25
4	Orchidarium	6.20
5	Arboretum	6.87
	Total	69.23

4.13.1 Biodiversity Park

The area falling adjacent to existing herbivore safari supported with good vegetation is identified for developing as Biodiversity Park. The total area demarcated for this purpose is 43.35 Ha. The forest type of the area is varying from scrub type to southern tropical dry deciduous forests. The vegetation in this area is characterized by stunted to medium sized dry deciduous trees. The repeated hacking by the local villagers for the need of firewood and small timber has denuded the area. The important tree coverage in the area

are Anogissis, Chloroxylone, Acacia, Zizypus, Shoria, Terminalia, Pterocarpus, Rose wood, Sandal and with maximum of Bamboos.

The undergrowth is supported with lantana, cassia species, randia, gloriosa etc., Acacia instia is the common climber. The entire area proposed for Biodiversity Park is highly undulated having deep valley and rocky hills. The large extent of rocky outcrop adds up to the scenic beauty of the area. The soil on the upper region is red and gravelly where as in the valleys sandy loam formed with finer particles of decomposed rocks washed down and deposited during the rains. The unique character of this area attracts large number of birds round the year. The most commonly seen birds are Grey Jungle Fowl, Peafowl, Partridges, Parakeets, Orioles, Minivets, Wagtails etc.

Land monitor lizard, cobra, krait, pythons are the commonly seen reptiles in the area. Varieties of bees, butterflies and ants are seen seasonally. This kind of flora and fauna with a unique topography makes this area more special to any visitor come to explore the nature. If the area is rigidly protected against wild fire, the forest will revive in a span of next 2 to 3 years and the entire forest will be vibrant. These areas are always attracted by wild elephants and harbor them seasonally for 2 to 3 months during the crop seasons. The presence of good vegetation and adequate wildlife will qualify this area more to be a biodiversity park.

This area has the presence of religious temples on either side namely Narasimha temple at the eastern side and Suvarnamukhi temple on the western side, This temples will attracts large number of visitors round the area and they may give an opportunity to explore and conduct the nature excursion on a define trekking trails at cost.

4.13.2 Suvarnamukhi Religious Garden

There is old religious temple and pushkarani (pond) built around 100 years ago local people visits this area regularly to offer the prayer and to have sacred bath in the pushkarani. The mythological story to this place is that Raja Janamejaya had come and took bath in this pushkarani and cured of skin disease he was suffering. The tourist will visits this place to have sacred bath in the pushkarani. The inflow of tourist will be more on full moon day and no moon days having the belief that their prayer will be fulfilled. Due to over crowd of visitors the accumulation of litter is more. Non maintenance of the old religious structures are being damaged. Since these old monuments are located within the limits of National Park, no department other than the department of archeology is allowed to maintain. However since it is part of the National Park and managed by Biological Park these old monuments can be maintained as they are part of approved management activity. The visitor entry may be regulated by charging Rs 02.00 per head and this money can be recycled for the maintenance and providing additional facilities to the public.

4.13.2.1 Activities proposed

- Erection of chain link mesh along with solar power fence for the entire 3.56 Ha. This is required in order to prevent the entry of Suvarnamukhi visitors to adjoining Biodiversity Park
- Deepening and development of old tanks exist there
- Creation of a food court to facilitate visitors to eat
- General maintenance of monuments
- Construction of Security Room
- Construction of ticket counter

4.13.3 Medicinal Plant Garden

An area of 10.25 Ha is earmarked for the development of medicinal plant garden. A botanical garden may be devoted for development of medicinal plant and to sell the seedlings to the visitors. The objectives of this medicinal garden is to provide an opportunity to the visitors to see and learn about the medicinal value of different local flora and their conservation values and also to give an opportunity to purchase medicinal plants of their choice and raise them in their gardens/land to have the benefit of the medicinal plant for their traditional use.

4.13.4 Orchidarium

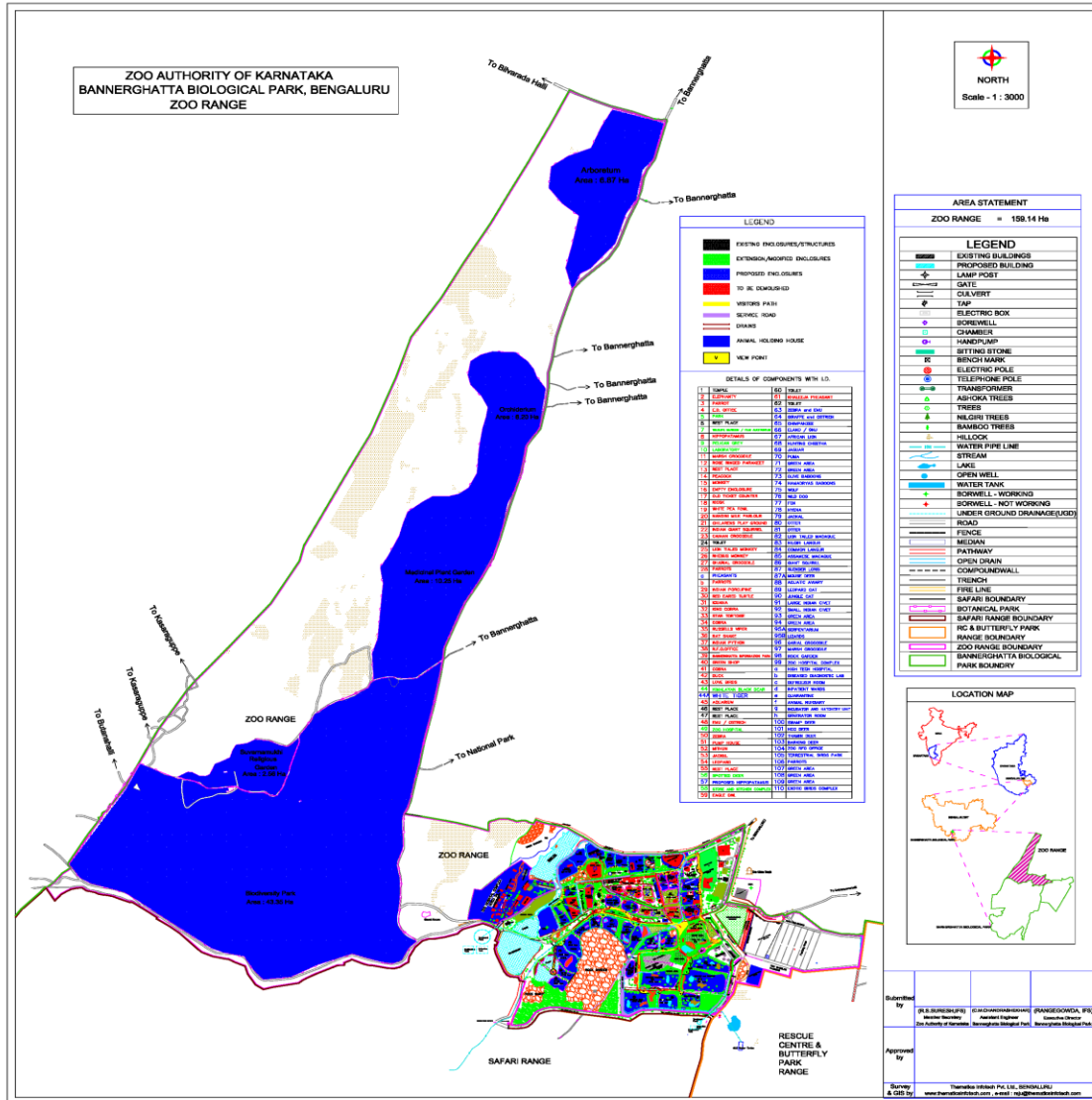
An area of 6.20 Ha is earmarked for the development of orchidarium. The location of Bannerghatta Biological Park is blessed with good climatic condition with moderate rainfall. The mean temperature of this area is around 30° Celsius during the summer and around 15° Celsius during winter. This kind of favourable condition will help to orchids to grow and establish. The orchids found in the Western Ghats and Eastern Ghats are chosen by duly considering their capacity of survival in this region.

The visitors will be given an opportunity to see the different kinds of orchids grow in both Western Ghats and Eastern Ghats of the state. This will also serve as a demonstration area to conduct various studies on growth and increment of orchids by botanist and other scientist.

4.13.5 Arboretum

An area of 6.87 Ha is earmarked for the development of arboretum. It is planned to develop as a tree park by planting the indigenous tree species present in the

forests. This will provide an opportunity for the professionals and scientist including **student** community to study and understand the local flora and its taxonomical feature. The important tree species native to South Indian forest such as Teak, Rose Wood, Honne, Matti, Nandhi, Dindal, Sandal and others will be planted and maintained to illustrate the silviculture and its practices to the interested people. The scientific community, professional and students will be allowed to see and study this establishment.



CHAPTER- 5

PERSONNEL PLANNING

1.1 INTRODUCTION

The workers engaged for various activities in the park management are without any field specific skill and knowledge. Their education level is also very low and most of them are illiterates. All these workers mostly involved in the low level managerial assignments. However by virtue of working in the park for several years they have gained not only the experience but acquired specialized knowledge with reference to the field they are working.

As and when the occasion arises they were given in-house training in the Zoo, Safari, Butterfly Park and Rescue Centre to develop adequate skill and knowledge.

The most important task required for carrying out zoo management activities by the workers are

1. Animal care and management
2. Animal health and nutrition
3. Visitors hospitality
4. Zoo education and Interpretation
5. Animal habitat enrichment

The regular assessment and evaluation of all the workers to ascertain their physical capacity and mental ability in the work is required. The staff is to be protected from exposure to risks in their duty by providing various safe guards. Their efficiency directly proportional to their salary perks and welfare measures the Zoo management assures.

The Bannerghatta Biological Park does not have the permanent staff in its establishment role. There are 208 workers working for the different units of Bannerghatta Biological Park on direct contract basis except 26 workers who are on deputation from other departments are only the permanent staff. There is a frustration amongst zoo workers and antagonism between staff and management to regularize their job. This situation is prevailing past 2 decades and severely affecting the management of park. Therefore there should be mechanism to overcome this anomaly in the system as urgent as possible. Sufficient motivation should be available for the regular staff and worker to encourage them to work with sincerity and devotion.

1.2 WAGES AND PERKS

The contract employees engaged on annual work contract are getting the wages at par with unskilled labours as per the sanctioned schedule of rates of PWD. The workers right from the level of animal keeping, animal nursing, gardening, and clinical management are performing skilled job as the said positions are highly technical. The management authorities need to consider this reality and treat the workers working in the Zoos and parks as skilled and they are to be given the wages fixed for the skilled labour as per the PWD SSR.

If the workers are not recognized to the worth of their jobs and responsibilities and reciprocated with equivalent salary and perks, they may not work to their full potentiality and the institution will be the loser. Therefore it is proposed to treat the Zoo workers as skilled workers and paid appropriately.

The contract workers are not entitled to get any perks like TA, medical reimbursements, leave salary and any other claims the government employees are availing. If their service is not recognized with some special incentives they may fail to accept the responsibilities and challenges at crucial time. Therefore it is proposed to give incentives for any extra works out of the working hours in a day. It is worth to recognize their services in the extra working hours by paying at least half of their daily wage for the work carried out more than 3 hours under any circumstances.

1.3 LEAVES AND HOLIDAYS

The nature of work in the park has been considered as essential service and all the worker are expected to work on all days in a month. It is the practice invogue the wage for the days, the employees absent for the duty for any domestic reasons is not paid. All the government officials are entitled to avail various kinds of leave such as casual leave, commuted leave, medical leave, maternity leave etc. In the case of Zoos and park neither a male or female worker are given any kind of leave. The continued exposure for the work not only brings the monotony but breeds boredom and casualness. This will have considerable impact on the net output of employees while delivering their duties and responsibilities. Therefore it is necessary to provide some essential leave to attend their domestic works. Therefore it is proposed to allow each contract employee to avail 2 days leave in a year on important religious festival and monthly 1 day leave as monthly off in addition to half day weekly off being given on Zoo holiday on every week.

Under any emergency situations if the worker either on voluntary basis or on compelling reason to work in the larger interest of the Zoo on holidays at his credit he should be compensated with applicable wages.

1.4 MEDICAL INSURANCE

All the workers are exposed to different kinds of risks while working with the animals and also in the Park. Most of the diseases such as TB etc are communicable between workers and animals. The affected workers due to animal disease such as TB etc are not been given financial support for the medical treatment. It is essential to consider this kind of happening in a more sympathetic manner and whenever the animal keepers, supervisor or any of the official working with animals affected with such diseases are given medical reimbursement towards the treatment.

1.5 RISK ALLOWANCES AND COMPENSATIONS

The animal keepers, supervisors, clinical staff or any other staff working with the animals are always exposed for the risk of animal attacks. Generally during the feeding, medical treatment, Shifting, translocation or any of the management interference with the animals the chances of conflict and encounterments are bound to happen and happening occasionally. Most of the time this kind of conflicts, encounterments and attacks will result in injuries and deaths.

The Government of Karnataka is giving compensation for the injuries caused by the wild animals and also to the deaths happened due to wild animals in a more liberal manner in case of involvement of publics. In the Zoo scenario most of the workers are not regular employees and are working on out source basis. Whenever the injuries or death caused by the captive animals to the workers, the entire cost of treatment in case of injuries and Rs 5 lakh in case of death shall be given to the affected family. The same procedure also should be made applicable in case of casual workers who comes to the park for daily mazdoors.

1.6 WORK OUTSOURCING

The execution of some of the works in the park can be undertaken by outsourcing it to any serving organizations, labour cooperative societies, authorised service providers, NGOs and private agencies etc. The pre-requisite of the service provider shall be that, he must have sufficient expertise skill and trained man power for executing the works.

The following works have been identified for outsourcing.

1. Sanitation in Visitors toilets
2. Sanitation in Public utility area in BBP
3. Park security

4. Cafeterias and refreshment stalls
5. Maintenance of parks, gardens and lawns
6. Jungle clearance, weeding in the animal enclosures and on forest roads
7. Fire protection works
8. Naturalist service
9. Trekking and nature camp facilities
10. Zoo education activities

1.7 REGULARISATION OF STAFF

Although, the institution is 40 years old, no concerted efforts were made to recruit the employees as per the need of the job. The employees are outsourced on contract basis and deployed for the various important activities of the zoo. The most crucial and skilled work like animals keeping, animal house management, animal feed and fodder management, animal nursing and upkeep and animal clinical management have been entrusted to outsourced employees in the absence of regular staff. The other important duties and responsibilities in the zoo management such as water and sanitation management, zoo kitchen management, zoo garden management, zoo visitors management and zoo hospital management also been given to the outsourced employees in the absence of permanent staff of the department.

The contract employees such deployed to various jobs and responsibility in zoo management have gained the expertise in their field and now emerged as qualified human resources in the field. Therefore it is imminent at this juncture to use their expertise in overall development of the park. Due to long period of contract service put up by the outsourced employees and non regularization of their service within the eligible time caused compulsion on these employees to serve the park even after the lapse of qualifying age for their permanancey.

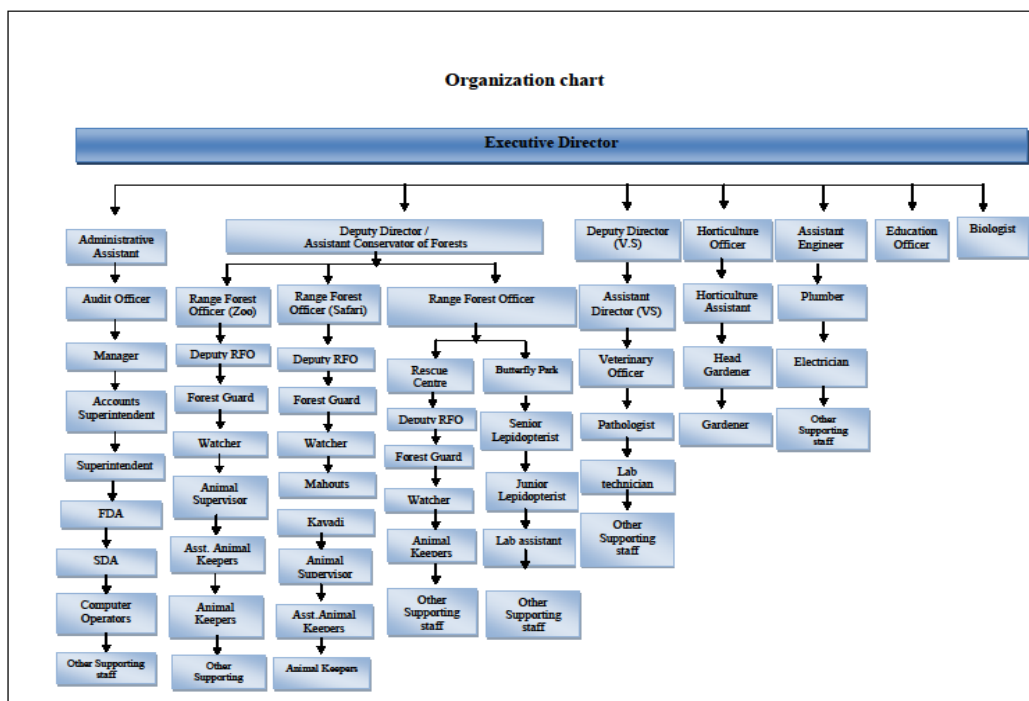
The Governing Council of Zoo Authority of Karnataka have approved the Cadre and Recruitment Rules and submitted to Government of Karnataka for approval which is presently in the process of finalization. All the outsourced employees serving the park over the years need to be considered for regularization of their services to ensure the continuity of professionalism by making appropriate provisions in the Cadre and Recruitment Rules and Procedures. Depending on the ground demand the various working level of staff has been duly and consciously worked out to constitute 40 category of posts and 208 posts as bench mark number for the efficient functioning and able governance of the organization.

1.8 Proposed staff pattern

Sl. No.	Category Posts	Post sanctioned	Post filled up	Proposed
1	Executive Director	1	1	0
2	Deputy Director	1	1	0
3	Deputy director (AH&VS)	1	1	0
4	Asst. Director (AH & VS)	1	1	0
5	Senior Lepidopterist	1	0	1
6	Junior Lepidopterist	2	1	0
7	Veterinary Officer	3	3	0
8	Assistant Engineer	1	1	0
9	Administrative Assistant	1	0	1
10	Audit Officer	1	0	1
11	Accounts Superintendent	1	0	1
12	Range Forest Officer	3	3	0
13	Superintendent	2	0	2
14	Manager	1	1	0
15	Assistant Curator	3	0	3
	Assistant Horticulture Officer	1	0	1
16	Assistant Manager	2	0	2
17	Biologist / Education Officer	2	1	1
18	Lab Technician	1	0	1
19	First Division Asst.	4	1	3
20	Senior Driver	2	0	2
21	Forester	4	2	2
22	Horticulture Asst.	3	0	3
23	Animal Supervisor	5	0	5
24	Second Division Asst.	5	0	5
25	Driver	5	5	0
26	Plumber	3	1	2

27	Electrician	2	2	0
28	Head Gardener	4	0	4
29	Animal Keeper	40	40	0
30	Veterinary Lab Assistant	2	0	2
31	Computer Operator	6	3	3
32	Forest Guard	10	0	10
33	Forest Watcher	10	2	8
34	Mahouts	10	1	9
35	Kavadi	10	10	0
36	Attender (peon)	7	7	0
37	Gardener	8	8	0
38	Assistant Animal Keeper	25	25	0
39	Sweepers	15	15	0
	Total	208	136	72

1.9 Organizational structure



CHAPTER 6

DISASTER MANAGEMENT

1.1 INTRODUCTION

There are various environmental factors and also the factors created due to civil disturbances results in threatening conditions which may require a rapid and planned action to minimize the damage to the inmate animals, visiting guests and the facilities created. Some of the natural events like severe weather lead to flooding, earth quakes, draught, severe cold and wild fire not only can damage the park and its animals but will do serious damage to the local community, resources and equipments to salvage the natural catastrophes will be a challenge. The most important equipments like “**generators, axe, sickles, saws, water and adequate food troughs**” should be maintained by the park at all times. Bannerghatta Biological Park is bounded by the natural forest of National Park all around and always poses threat of forest fire, tree felling and hunting of wild animals.

1.2 DISASTER MANAGEMENT TEAM

The efficient management of the disaster will be utmost priority in the park management. The well planned and timely attended disasters would minimize the damage which is possible through a team constituted for the purpose. The following is the team constituted as disaster management team having the jurisdiction over all units of the park to address various kinds of disasters which are mentioned in the plan or otherwise.

- | | |
|--|-------------|
| 1. Deputy Director (admin) | Team leader |
| 2. Deputy Director (Veterinary Service) | Member |
| 3. Assistant Director (Veterinary Service) | Member |
| 4. Public Relation Officer (PRO) | Member |
| 5. Range Forest Officer (Concerned unit) | Member |
| 6. Zoo Engineer | Member |
| 7. Chief Security Officer | Member |

6.2.1 Flow of information

The concerned animal keepers or official in-charge of the place where such disaster take place shall immediately report to the Range Forest Officer of the unit. The Range Forest Officer, in-charge of the unit, immediately reports to the Deputy Director and Executive Director for immediate action. The Deputy Director after the receipt of such information shall immediately spring into action to combat and also to take stock of

the situation. The team shall immediately convene an emergency meeting to plan and mitigate the problem.

The disaster management team shall look into the following by conducting a regular meeting at least once in quarter and three meetings compulsorily in a year under the chairmanship of team leader. The Executive Director will have annual meeting to reveal the meeting in the 1st month of financial year.

- 1) Assessment of risk.
- 2) Likely impact and damage likely to be caused. Falling of trees, flooding of enclosures, snapping of power lines, breaking of water supply, breaking of enclosures, barriers, and escape of animals. In most cases it shall affect the life of animals, their safety and security besides that of the zoo staff and visitors.
- 3) What shall be the line of command for facing such exigencies and alternate command module if first one fails.
- 4) Equipments needed to speed up restoration measures.
- 5) Training to the staff to meet such exigencies and operate such equipments.
- 6) Periodic mock drills to stimulate preparedness among staff and to test the working of the equipments, which shall be kept maintained all times

1.3 FIRE CONTROL

The enclosures located within the Bannerghatta zoo don't have the threat of either accidental fire or natural fire because, none of the enclosures are connected with traditional electricity and no forest coverage is abutting to the zoo.

However the animal facility located in the Rescue Centre and Safari will have the threat of forest fire as they are located in the midst of forest area. The harsh summer prevails between mid February to April poses severe threat of forest fire. In order to manage the forest fire problem some of the strategies are adopted. Such as clearance of fire protection lines around the animal enclosure and engaging the forest fire watchers. Annually some fire incidents are do occur and the forest fire watchers are engaged to extinguish the fire.

1.4 FLOOD MANAGEMENT

The geographical location of the park is always remains favourable to receive both of the monsoons like North-East and South–West and also precipitation due to cyclonic effect. The over rain fall in the region leads to flood situation in the zoo and water inundates in deer’s enclosures. Due to flooding of enclosures the animal life not only become miserable but the situation leads to escape of the animals from the enclosures. The zoo will have a contingency plan for dealing such exigencies. The contingency plan will envisage evacuating the water, rescuing the escaped animals and providing proper drainage to divert the flood water. The plan also includes cleaning and sanitizing the enclosures to eliminate micro organisms and pathogens.

1.5 EPIDEMICS OUTBREAKS

Bannerghatta Biological Park is surrounded by large number of human settlements. All these settlements have number of village cattle which mostly depend on these forests for grazing. As these cattle are not regularly exposed for annual vaccinations, they act as a carrier for some of the dreaded wildlife diseases like Foot and Mouth (F&M), Hemorrhagic septicemia (HS), Anthrax, Rinderpest etc., The vaccination of these village cattle is to be carried out by department of Animal Husbandry and Veterinary Services and closely monitored by Bannerghatta Biological Park authorities. Any unmanaged situation leads to outbreak of epidemics which would end with bigger causalities in the populations.

6.5.1 Outbreak of Foot and Mouth Disease

During 2012-13 the outbreak of Foot and Mouth disease in the local village cattle spreads to the wild population of the park and resulted in deaths of large number of herbivores. The entire nilgai population housed in the herbivores safari wiped-out along with the large number of causalities in deer and wild boar population. Although, the zoo hospital backup medicine and other essential materials used efficiently to tackle the disease, the causalities could not be avoided. The problem was tackled through the support of local veterinary staff. As a lesson learnt in managing the epidemic disaster, the zoo hospital will be upgraded by providing all the facilities such as vaccine equipments, darting kits and other essential gadgets.

The adequate care has been taken to handle the other diseases which are suspected to be in the wild population of the park such as **Malignant Catteral Fever (MCF)**, **Canine Distemper** during 2011- 12 in the herbivore safari 02 number of gaur 06 year old mother with one and half year old calf have died within a span of one year and the cause

of death was confirmed as **Malignant Catteral Fever** (MCF) which is one of the rare disease and also **Canine Distemper** in the bear population. The Bannerghatta Biological Park authority in due consultant with Institute of Animal Health and Veterinary Biologicals (IAH&VB), Bengaluru and Indian Veterinary Research Institute (IVRI) working out the modalities to tackle this disease.

6.5.2 Tuberculosis disease in rescued bears

The rescue facilities created for housing the rescued dancing bears has witnessed the large number of deaths during 2011-12 and 2012-13 due to tuberculosis (TB). All these bears got the human TB transferred, while they were handled by the Khalandhars for the street performance. Series of deaths in rescue bears created hue and cry within and outside the BBP as it had become serious public issue. With the involvement of IAH&VB and Veterinary College, Bangalore the situation was handled and brought to control. The BBP hospital has been provided with required infrastructure and medicine to counter this kind of disaster.

1.6 CIVIL DISTURBANCES

During the breakdown of the law and order due to social disturbances, it is very important to have a plan for the supply of feed and fodder to the animals. Accordingly a standby food storage and food supply system is guaranteed to the animals.

The park is visited by large number of veterans, women, children and physically challenged persons. During civil disturbance period, evacuating the visitors to the safer area is more imminent as panic would results in injuries and damages. Therefore the park is equipped with evacuation team with volunteers. A siren in the zoo has been installed to give a warning alarm of such danger situation in the zoo.

Adequate police support also will be obtained from the local police office which is situated in the Bannerghatta itself.

1.7 ABRUPT STOPPAGE OF FEED SUPPLY

An alternative method of supply of food to the animals is planned by providing stored food in emergency situation. The zoo storage is planned to provide deep fridge facility which can store sufficient quantity of meat, chicken and fish to feed the carnivores. Further the enhanced facility in the store would accommodate the storage of emergency feeding articles like canned food, grains, and cereals etc., required for emergency situations. The sufficient quantity of hay, paddy straw, wheat and rice bran are also adequately stored to meet the emergencies.

In case of failure by the feed supplier to supply the daily requirement, it is planned to procure the required food articles from the government supplies and through cooperative outlets.

1.8 COLLAPSE OF BUILDINGS

Most of the buildings constructed in the limits of BBP are planned for a minimum period of 50 years. Due to any natural catastrophes if any buildings, animal enclosures etc., are collapsed the evacuation of animals and people trapped underneath will be the first priority. The departments involved in the evacuation such as fire force, police and task force constituted for building demolition will be approached for immediate assistance. Further it is a must to seek the support from outside agencies since such disaster cannot be handled by the zoo personals alone. It is absolute to maintain a good contact with other government department and non government agencies in such emergencies. The contact telephone number, address, email id be kept ready for insisting their services. The important officers to be in contact are

- Deputy Commissioner of the District
- Superintendent/Commissioner of Police
- Police station / Police control room
- Local Fire brigade
- Disaster management unit of the state
- Tahasildar of local area
- BESCO (Electricity board)– local office
- Hospitals
- Ambulance
- Veterinary hospitals, colleges and other vets in the city treating wild animals like the animal rescue centers

1.9 IT SYSTEM FAILURE

E-governance has been the tool of park administration as most of the important activities related to the administration are being carried out through e-media. E-ticketing, park website, CCTV and other electronic surveillance system is supported by power supply. If the failure of power supply in the park limits would paralyze the day to day

management. In order to ensure the power backup even during power failures the alternatives such as wind power, solar power, UPS backup and generator system have been installed. However in worst scenario the alternative power will be linked only to the needed facilities for the day to day requirements like e-ticketing, zoo hospital, CCTV.



Staff with Cricketer Sri Harbhajan Singh

CHAPTER-7

CONTINGENCY PLAN

7.1 INTRODUCTION

Every zoo have technically competent and well documented contingency plan for tackling the un-usual situations which are likely to emerge during the course of management. Further it is mandatory on the part of management to earmark the required financial resource apart from identifying the human resources to address the problems. Although, there is no document available at the disposal of park management, the emergencies are addressed based on the experience acquired by the staff by virtue of involving in the management. Bannerghatta Biological Park has 3 different management units such as zoo, safari and rescue centre wherein number of such emergencies arises.

The Biological Park is bounded by natural forest of Bannerghatta National Park wherein large number of wild animals are inhabited. The present area of the park was originally a part of national park which has the routes of traditional movement of wild animals like elephants, deers, sloth bears, leopards etc. The barricade around the boundary of BBP and conversion of forest area into animal enclosures has severely affected the traditional movement of wild animals. Therefore the tress passes of wild elephants, deers and leopards are regularly noticed in the area which many a time leads to conflict. This kind of conflict always results in the damage of boundary wall, damage of animal enclosures by the elephants and tress pass of leopards into the zoo and safari and hunting inside.

7.2 WILD ELEPHANT CONFLICT

The Forests in the Bannerghatta Wildlife Range of Bannerghatta National Park has become abode for the wild elephants by virtue of its good fodder and water. It is estimated around 50 to 60 of wild elephants have become resident to these forests which is roughly around 42 Sqkm. Some of the elephants have turned to be the crop riders and frequent to the agricultural field abutting to Bannerghatta Biological Park are passing through the Biological Park area including the Safari, Rescue Centre and Zoo. While

passing through they not only damage the boundary walls, enclosures and other structures but they also pick up conflict with captive animals.

Some of the male wild elephants are socialized with the captive female elephants housed in BBP are also regularly frequent to the zoo and rescue centre to join the captive herd. While doing so they create horror and panic among the zoo staff and zoo visitors as it commonly happens during the dawn and dusk hours including the day some times. Therefore it is binding on the management to engage the elephant scarring watchers during crop season to drive the elephants. Further repair the boundary wall and enclosures is a continuous work because it has to be attended as and when the damage done by the wild elephants.

7.3 ANIMAL RESCUED FROM WILD

Bannerghatta Biological Park has developed facilities for rescued animals with the state finance. The Central Zoo Authority have supported to develop the rescue centre in a comprehensive manner depending upon the scientific requirement in providing space and the facilities to the rescued animals. The various wild animals like tiger, sloth bear, leopard, deer, elephants and birds involved in the human conflict are rescued and brought to the Bannerghatta Rescue Centre for rehabilitation. The Karnataka Forest Department always seeks the assistance of expertise and facilities available at the disposal of Bannerghatta Biological Park in conducting the rescue operation. The Karnataka Forest Department further authorise the BBP authorities to house and maintain such rescue animals till they are rehabilitated by giving required financial assistance. Due to this approach large number of rescued animals from the nature is translocated to BBP in addition to housing the birds and animals seized by various authorities. The park has best veterinary expertise and facilities with equipments. However the adequate financial assistance has to be planned out of the park budget till it is reimbursed by the government.

7.3.1 Rescue Facilities

The following are the rescue facilities are under the control of Bannerghatta Biological Park

- Wildlife Rescue and Rehabilitation Centre for smaller mammals and birds
- Wildlife SOS for sloth bears
- Rescue and Rehabilitation Centre
- Life Time Care Facilities (Proposed in the plan)

7.4 ESCAPE OF ANIMALS FROM ENCLOSURES

The escape of a animals from the bear safari do occur at times. This is due to non co-operation of bears in remaining in the safari area as the natural food outside the safari area is available in the form of anthill, roots, honey and tubers etc. It is planned to strengthen the outer wall of the Bear Safari moat to prevent the escape of bears. The veterinary units and animal keepers are well trained in recapturing such bears.

Further the park also witnessed the events of escape of tiger from the safari and the leopard in the zoo during earlier years. Therefore there is a need to take call on these incidents and ensure the effective management system in place to combat the situation.

7.4.1 Measures to prevent escapes

The following are the identified measures to prevent animal escapes

- The trees around the enclosures are to be trimmed regularly to avoid jumping the moat and enclosures to escape.
- The doors and sliding gate system be always kept in good condition with lock and chain
- The peripheral path of the safaris and the moat be regularly maintained
- The Chain link fencing mesh checked annual basis and repaired as and when required.

7.5 MONKEY MENACE

The natural forest covering in the zone of Bannerghatta Biological Park more particularly Bannerghatta Zoo is the original habitat for the monkeys living presently. It is believed that this population is a resident population where the zoo and safari are developed. The availability of the natural food in the nature has become scarce and therefore monkey population has become dependent on the food supplied to the animals in the zoo and safari.

The availability of abundant food in the zoo and safari assures the comfortable life and stay. Therefore they have become naturalized in this area. Further the seasonal flowering, fruiting and flosses also guarantees the part of food seasonally. The left out food of visitors and feeding to these animals by the visitors also gives the assurance to confine the monkeys in this area. The food security guaranteed in this region for the resident monkey population results in multiplication of population and the population

size is dynamically growing year by year. If the population is not handled to control and regulate, the menace will multiply in its strength.

7.5.1 Measures to control the menace

To control and regulate the monkey menace, the following actions are to be taken

- The alpha male and potential reproductive female responsible for breeding are to be involved for clinical management like tubectomy and vasectomy
- Measures are to be taken to stop feeding by the visitors.
- The zoo animal feeding has to be done in the closed feeding kraal.
- The left out food from the visitors to be salvaged immediately.
- Visitor food courts are to be closed with proper barricading and provided with dustbins.

7.6 DOG MENACE

The northern part of Bannerghatta Zoo is merged with Bannerghatta Township. The large number of stray dogs live in the adjoining area will have access to the zoo. Even though boundary wall guards the entry, at some places there are vents and open drains pass through which facilitate the entry of dogs into the zoo. As the stray dogs are not exposed for reproduction controlling methods by the local bodies, the multiplication is fast and the zoo provides an assured place for littering and nursing the young ones.

7.6.1 Measures to control the menace

The adequate measures are to be taken to control the entry of dogs into the zoo by following

- All the vents, drainages and even to the entry gates, the cattle proof gratings to be fixed.
- Any stray dogs are noticed in the premises of zoo, safari and rescue centre are to be captured and release outside.
- Measures are to be taken to stop feeding by the visitors.
- The zoo animal feeding has to be done in the closed feeding kraal.
- The left out food from the visitors to be salvaged immediately.
- Visitor food courts are to be closed with proper barricading and provided with dustbins

7.7 ARRANGEMENT OF FOOD IN CASE OF STRIKE (NON SUPPLY BY CONTRACTORS/ STAFF)

In case of any exigencies arises due to agitation, protest and strike by the working staff, the food distribution to the animals will be affected. During such exigencies the disaster management team will take the responsibility of borrowing the staff services from National Park authorities and any voluntary service organization. In addition the security personal available under the control of BBP will be deployed to monitor the crisis.

7.8 SNAKE BITE

Although, the BBP staff are working in the forest area as all the units of BBP are located in the midst of forest, no incidences of snake bite so far recorded. however, as a safety measure anti-venom is kept in the Zoo hospital and shall be used as and when it is needed.

7.9 VISITORS GETTING INJURED

It is planned to have an **Emergency Medical Service Centre** which will have the first aid facility also. The injured visitor will be immediately shifted to first aid medical centre and treated. If it is further needed he will be referred to the hospital through zoo ambulance.

If any safari visitors injured or hurt the first aid facility kept in the bus will be used. An effective communicative system has been established by providing walkies and cell phones to staff to communicate this emergency information.

7.10 VISITORS FALLING INSIDE ENCLOSURE

The BBP has not witnessed such incidents so far, however, if it happens in future the following actions are planned.

- Distract the attention of animal to the fallen visitor
- Ladder, rope, net are kept ready at the Range of the zoo to rescue the fallen visitor
- If need be the animals will be chemically immobilized.

7.11 FIGHTING AMONG ANIMALS

The fighting among carnivore animal are quite serious and many at times this leads to either casualty or grave injury. In order to separate the fighting animal crackers,

drum beat may be used. It is always planned to release the compatible animals to the open enclosure to avoid fighting. Further the common doors and gates will be always chained and locked to avoid entry into the other enclosures. Also whenever the common fencing is running between two enclosures it is provided with double fencing in order to prevent the access.

7.12 EPIDEMICS

This is generally occurs during monsoon in the month of August and September and when the season remains wet due to rain and cloudy weather causing conducive environment for the flies, vectors to breed and spread the infections. The aged carnivore animals will also have the problems during this season.

7.12.1 Measures to control the epidemics

The park has following preventive measures to control the epidemics.

- i. To cut and clear all weeds and vegetation around the holding houses to a radius of 20m.
- ii. Fumigate the surroundings against the flies and vectors.
- iii. To ensure the proper cleaning and drying of the floor of the holding houses. Anti-septic deodorants are preferred to clean the floor to get rid off contamination.
- iv. Medicines will be kept ready for the known epidemic disease for administration when such noticed. Veterinary unit is always remains alert during the wet season.
- v. Care will be taken to make the premises free from leftovers of meat and other eatables.

CHAPTER - 8

CAPACITY BUILDING

8.1 INTERACTIVE TRAININGS

Ex-situ management either in Zoo or Safari essentially requires a very Skilled, knowledgeable and trained personnel for manage, upkeep and maintain the various captive establishments. As time changes the new challenges will emerge and the staff is required to upgrade their skills and potential to handle any eventualities. The task of capacity Building in different categories of park management more particularly in the field managerial level is very essential from the point of better care and management of animals by providing better nature education and smooth function of the zoo.

8.2 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 youngsters. A group of youngsters would be attached to such senior staff for some time, so that all the fine skills and nuances 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.

8.3 TO ENCOURAGE SPECIALIZATIONS AND INTERACTION WITH RETIRED STAFF

Tapping the experience of skilled and retired personnel is advantageous to maintain the zoo in good conditions. By virtue of spending lifetime in animal handling and care, some would develop finite and highly special knowledge about particular animal with respect to behavior and breeding ability. Zoo must tap this knowledge and encourage willing personnel among the existing staff to acquire and get expertise in particular group of animal species. It is desirable to elicit the preferences of each person,

and assign jobs to attain specialization in the field. In this background, it is planned to conduct interactive sessions to select staff with notable retired staff in Animal Keeping, Gardening, Security and Veterinary care.

8.4 AWARD TO STAFF MEMBERS

Motivation is important to sustain the interest of staff members. Therefore, the zoo has newly introduced giving rewards to staff members recognizing their service for exemplary services. Cash awards are being given to the animal keepers, gardeners and other staff with appreciation certificate. Further it is also proposed to institute awards in the following names on annual basis to the best outstanding contributor, best animal keeper, best gardener and special award respectively.

1. Chairman, Zoo Authority of Karnataka Award (Chairman Award Rs. 50,000/-)
2. Member Secretary, Zoo Authority of Karnataka Award (MS Award Rs. 40,000/-)
3. Zoo Director Award (ED Award Rs. 50,000/-)

8.5 RECRUITMENT POLICY

The Zoo had been established during the year 1971, and it has got 42 years of history. The Zoo has achieved all round progress in display of animals, breeding of endangered species and also imparting values of wildlife.

It is needless to state that the success of the Zoo Management depends upon the quality of staff working in the zoo. The recruitment is not so easy, especially the animal keepers, as the job of a keeper is quite risky and require guts and courage to work with the wild animals.

After taking stock of the existing staff strength, the comprehensive draft Cadre & Recruitment Rules are prepared and got approved by the Zoo Authority of Karnataka and now under active consideration of the government for final approval. Once the cadre and recruitment rule are approved, the existing vacancies would be filled up. Experience and skills are given priority over the qualification at the entry cadre like animal keepers, gardeners etc. Further ticketing, security, transportation, catering, gardening would be outsourced after following transparency act and rules.

8.6 KEEPERS TRAINING PROGRAMME

The park is planned to organize keepers training programme in collaboration with the Central Zoo Authority in regional languages for keepers. The themes included crisis management and zoo emergencies, enrichment, management of birds. The programme

could be organized for one month, providing opportunity to visit various zoos in the country to have practical knowledge and to interact with them for better management.

The keepers so trained should be entrusted with higher responsibility and incentives will be given. Also experienced and dedicated keepers will be sent to foreign zoos for learning the advanced skills of zoo management.

8.7 ADMINISTRATIVE TRAINING

The personnel working in administration section in the zoos were not sent for training to improve their skills. Normally after initial recruitment, they will be working continuously without any opportunity to enhance their skills. Their talents need to be recognized and encouraged for exposure training for the benefit of the zoo.

8.8 MIDDLE LEVEL, TOP LEVEL TRAINING ON ZOO MANAGEMENT

The Wildlife Institute of India and the Central Zoo Authority regularly conduct special and focused training and workshops on different aspects of wild life management and policy. Participation of top level management of zoo is must and essential to upgrade their knowledge and bring changes and adopt newer techniques as enunciated in national zoo policies and rules. Regular interaction and opportunity to visit other zoos would help to acquire suitable animals, enrichment of enclosure and other aspects of zoo management such as crowd management and initiation of better visitor facilities etc. it also provides an opportunity to interact with many experts in the field, who shall participate as faculty in the training programme. The zoo should take the benefit of the training to have trained officers in the management for better results.

8.9 TRAINING THE EXECUTIVES

It is always advisable an officer to work as the Executive Director for at least 5 years and he should be exposed for all the training in the country and foreign countries viz. Jersey Wildlife Preservation Trust and in Smithsonian Institute are preferred. He should also be sent to all the zoos to gain experience and to run the zoo on scientific lines. Further all other second line executives also should be sent to various trainings, exposure trips to various zoos inside the country and abroad.

8.10 ZOO VETS TRAINING

The works of the Zoo vets are very important from the point of healthcare management of animals. As the Zoo houses valuable animals and failure to diagnose and able to provide treatment in time may lose the valuable animals. The Zoo vets in majority of the Zoos work on deputation for 3 to 4 years. It takes at least 2 years to have control and by the time he gains experience he will be transferred to his parent department. The deputation period not less than 5 years is to be fixed and sent to foreign countries including New Jersey Wildlife Preservation Trust and also to participate in workshop/conference to acquire knowledge.

8.11 ZOO EDUCATORS TRAINING

As conservation education is one of the fundamental objectives of zoo, the Education officer should be trained properly to organize training programme for the students NGO's and Zoo volunteers.

8.12 ZOO VOLUNTEERS TRAINING

The volunteers should be given orientation training regularly, so that they can assist the Zoo management in due necessities.

8.13 REGIONAL COMMITTEE OF EXPERTS

A Regional committee of experts constituting leading veterinarians should be nominated to train Zoo vets and to assist in handling the case as and when required.

CHAPTER - 9

E-GOVERNANCE

9.1 INTRODUCTION

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 stake holders and clients. BBP has made use of significant advances in Information Technology sector and has 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.

9.2 COMPUTERIZATION OF OFFICE WORK

Presently there are sufficient computers installed in all the sections and they 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. The details of computers installed and proposed are as follows.

1. General Section	1 (1 Laptop)
2. Finance Section	1
3. Executive Director's chamber	1(1 Laptop)
4. Engineering Section (proposed)	1
5. Range Forest Officers	3
6. Hospital (one additional proposed)	2
7. Laptop with data card (proposed)	7

Realizing the need for exposure and training, many of the staff members have been trained at various Institutions and they are capable of utilizing the advanced software.

1.3 MAINTENANCE OF ACCOUNTS AND OFFICE RECORDS

The BBP is a unit of 'Zoo Authority of Karnataka' which is a Society registered under Karnataka Societies Registration Act, 1960. As per Section – 12 of this Act, 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. As per Section – 13 of the Act, it is also statutory requirement to get the accounts audited by a Chartered Accountant. To be in consistent with Section – 12 & 13 of the Act, accounts of BBP are being maintained in Double Entry System of Accounting.

The park has acquired the 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 will be computerized to achieve accuracy and transparency.

9.4 ENTRANCE GATE

This is most important aspects from the point of crowd regulation and revenue realization. The entrance tickets issued to the visitors have been computerized with facilities to monitor the flow of visitors and amount realized may be viewed by the Executive Director's chamber in real time thus preventing any loss and the details can be stored in Executive Director's computer system reducing the use of book ledgers. This facility will enable accuracy, efficiency and transparency. There are different layers of scrutiny and supervision over the entry of visitors with valid tickets. Ticket issuing is outsourced to reputed agency with clear defined functions and facilities to be provided. Security will allow the visitors after ensuring valid tickets. A permanent staff is kept a watch on ticket issuing. Both Executive Director and Deputy Director could monitor the movement of visitor and issue of tickets from their chambers.

9.5 BBP OFFICIAL WEBSITE

A new official website has been 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 is designed and hosted at <https://www.bannerghattabiologicalpark.org> with the assistance of M/s Trinity Instruments, Bangalore. The website is user friendly and covers all the sections with historical background with attractive photo feature section on the existing animals. The website is constantly updated with the latest information, happenings, animal acquisitions and any issue related to park.

9.6 E-TICKETING & E-COMMERCE FACILITY

Due to phenomenal growth in visitors, it is planned to integrate E-ticketing with the existing website of Zoo. With the help of our bankers, E-ticketing will be put in place in the current year 2012, thus reducing the long queue and rush near the entrance gate. M/s Trinity Instruments, Bangalore has been employed for integrating e-ticketing and adoption payment through the website. Setting up payment gateway service using credit card, debit card etc.

9.7 CLOSE CIRCUIT CAMERAS WITH TV MONITORS

The park has registered record visit of tourists in recent years with annual growth 15-20%, Coupled with multiples of educational and other learning programmes. 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. BBP is steadily increasing the number of CCTV's to have continuous monitoring and to take collective steps in day to day behavior 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 is a monitoring unit in the Chambers of Executive Director with 5 Close Circuit Cameras installed at different strategic points viz.

- | | | |
|--|---|----------|
| i. BMTC complex (Master control) Ticket counter | - | 1 Number |
| ii. Entrance gate | - | 1 Number |
| iii. Old zoo entrance | - | 1 Number |
| iv. Executive Director Office | - | 1 Number |
| v. Safari Main Entry Gate (near Butterfly Park gate) | - | 1 Number |

It is proposed to install some more cameras at sensitive points.

1.8 WIRELESS NETWORK

There is an effective wireless network System with 14 handsets, which are provided to the security personnel and park staff looking after protection duty stationed at strategic points. The Security Officer will be monitoring and collecting the information for every hourly basis throughout the day and communicating to all competent level. It will be made to work efficiently to prevent major mishaps and to take corrective steps. The security is in constant touch with Executive Director and reports immediately any accident of significance.

9.9 MEDIA MANAGEMENT

Photographs of new born animals, press release on new acquisition, training camps and any other development related to park is now 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 park to reach out to large public and would attract crowds with little expense in real time. Correct and factual reporting of happenings in the park helps us to maintain transparency and credibility. Also the message of conservation education and importance of captive breeding and 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.

9.10 E-Procurement Platform of Karnataka Government

The Government of Karnataka, Department of Personnel & Administrative Reforms (E-Governance) in its Notification No: DPAR 3 e-proc 2010(1) dated 14/1/2011 has issued notification to procure works/ goods/ services through tenders on e-

Procurement Platform of Karnataka Government. <https://www.eproc.karnataka.gov.in>). Accordingly, all tenders for procurement of works, goods and services are being processed through e-portal of Karnataka Government. As such, the first tender processed through e-portal during 2011-12 inviting tenders for the supply of feed and fodder and also for the works. Since then, all tenders of this institution are being conducted through e-portal of Karnataka Government, achieving transparency in procurement.

9.11 ATM FACILITIES

The Vijaya Bank authorities were also persuaded to establish a facility of ATM within the zoo limits of Bannerghatta. As a result an ATM was installed during 2012 and the space on rent was provided to bank authorities. It is 24 hour facility being availed by visiting tourists, zoo employees and the local villagers. The present ATM facility is located at the entrance, and there is need for establishment of another ATM facility at new entrance plaza where maximum visitation is always noticed.

9.12 ELECTRONIC WEIGHING MACHINE

The feed and fodder for herbivore meet chicken and fish for carnivore being supplied to the park on day to day basis is checked for the weight and measured by using electronic weighing machine installed in the storage complex. All other food articles distributed from the store are also being weighed before distributing to the animals. There is a plan to upgrade the electronic weighing system even to weigh to the extent of loaded trucks with grass and grains.

9.13 HOSPITAL COMPUTERIZATION

Separate computers are provided to the doctors apart from general computer, wherein all reports pertain to animal inventory, data entry on ISIS and reports are generated. Internet facility is provided to the doctors to keep in touch with other counter parts world over for exchange of information and recent advances in animal health management. The following activities are computerized.

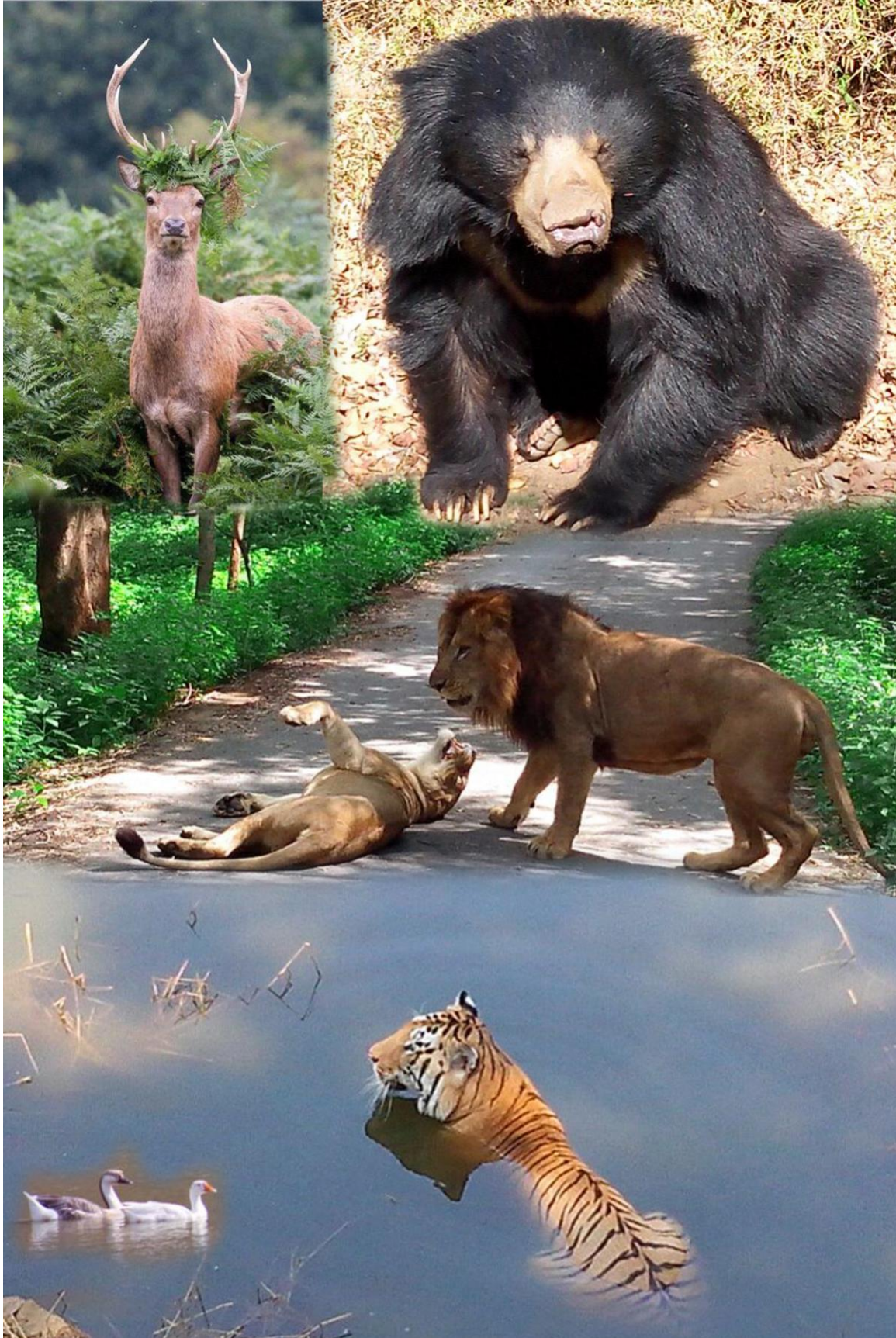
1. Data management software, updating of all information is being done daily basis.
2. Data documentation with regard to mortality, natality, acquisition and disposals.

3. ISIS (International Species Information System) & ARKS (Animal Record Keeping System): Online record keeping to have global access in the ZIMS software developed by ISIS will be adopted for better record keeping in zoos and it is user friendly. ZIMS can be used through internet. Required training to the concerned staff will be ensured.

9.14 E-BANKING

The financial management in the park is being changed from traditional to electronic system. The receipts and payments normally carried out on day to day basis in the park is being managed through E-banking. The payments from the offices are being made through E-banking by using RTGS facilities. It is planned to rationalize the payments only through RTGS method in order to ensure fast and timely transactions as this system proves more transparent.





CHAPTER 10

BROAD BUDGET ANALYSIS.

10.1 BROAD BUDGET ANALYSIS

This plan is envisaged for a period of 20 years from 2013-14 to 2033-34. The Bannerghatta Biological Park being located within the outskirts of Bengaluru is visited by large number of people from all over the world. It has the tremendous potentiality to grow further dynamically as Bengaluru being the most important tourist destination on the world map. The existence of lion, tiger, herbivore, bear safaris and Butterfly Park will remain as center of attractions of this place in future also. The increasing rate of visitors from year to year is the source of strength and inspiration for the multi dimensional development of this park. It has been proved during the year 2012-13 by achieving the ever highest revenue of Rs. 17.72 crores which is a national record. Therefore this elaborate plan envisioned for next 20 years will bring the total change through development, in the scenario of zoo management within and outside the country.

Central Zoo Authority has approved the Master Layout Plan for Bannerghatta Biological Park. In the approved Master Layout Plan it is proposed to extend the zoo area to 41.00 Ha from existing 12.80 Ha. In the zoo, different species such as primates, mammals, birds, reptiles and canids are planned to procure and display apart from creating an exclusive setup of African animals based on a theme called Africana. Most of the existing enclosures in the zoo are proposed for demolition and the new enclosures will be developed based on landscape plan with immersion exhibit concept. It is to achieve an integrated approach in the overall development the basic works such as visitors path, service roads, UGD, water supply pipe line will be realigned and executed.

As per the Central Zoo Authority mandates providing a minimum of 20.00 Ha of area for establishing the safari warrants to merge the existing lion safari with tiger safari to make it 20.00 Ha unit. This results in development of a new safari in 20.00 Ha area for lions apart from developing a new safari for the leopards in another 20.00 Ha of area. The proposed relocation of the rescued bears being monitored by Wildlife

SOS from the existing bear safari to Rescue Centre also demands for the creation of additional facilities. The establishment of Conservation and Breeding programme for the approved species a new infrastructure will have to be developed. A theme based project called Elephant Care Centre wherein night facilities will have to be provided. The proposed water supply project from Doddannanakere to zoo and rescue centre will be a priority work as water being the regulating factor for the management. All these new developmental activities apart from mini modifications and dismantle demands for huge financial resource.

10.2 REVENUE RESOURCE

In order to achieve the contemplated expenditure per annum for the entire plan period, it is imperative on the management authority to outsource the commensurate revenue. The following are the identified sources of revenue to the park

10.2.1 Internal Sources (Park)

- Gate Revenue (Zoo, Safari and Butterfly Park)
- Parking revenue
- Leases and rents
- Sales
- Animal adoption
- Donations
- Corporate Social Responsibility Contributions (CSR)

10.2.2 Grants

- Zoo Authority of Karnataka Grants
- Central Zoo Authority Grants
- Government Grants (Government of India & Government of Karnataka)

10.2.3 Loans

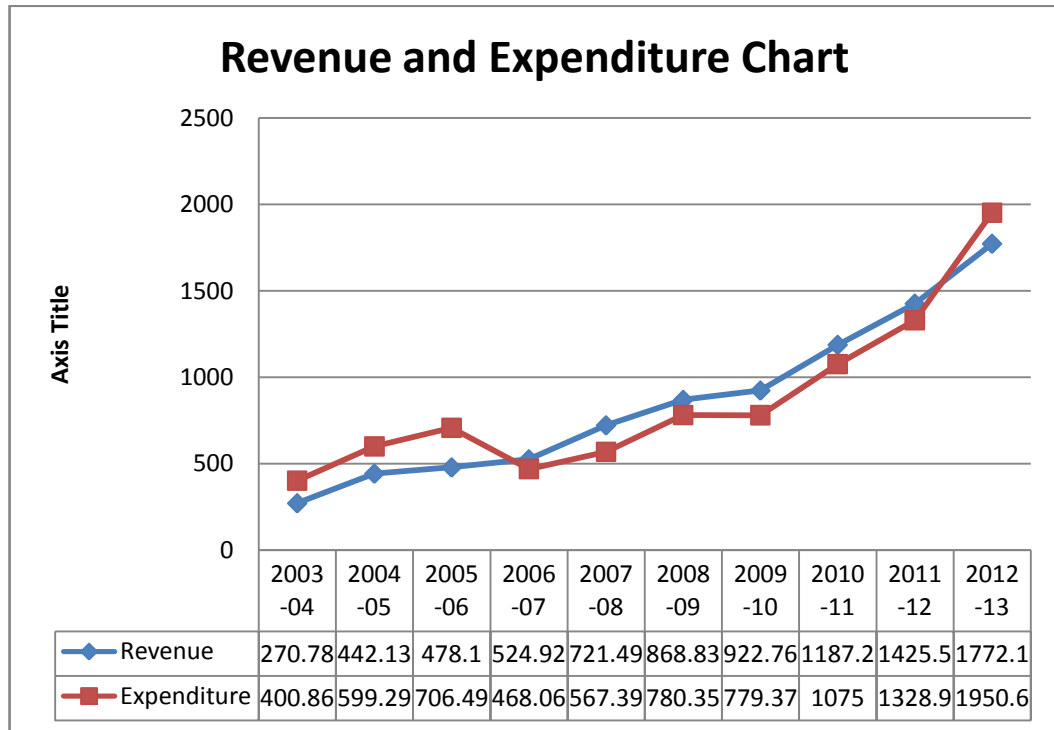
- It is also planned to avail the loans from the commercial banks during the crisis for maintenance and development with government guarantee.
- It is also planned to launch for public shares to mobilize fund

10.3 REVENUE REALIZED

Consequent to the steady increase in visitation the revenue inflow also being correspondingly increased. The average growth in the inflow of visitors and revenue,

the overall growth is around 20% to 25% . The revenue realization for the past 10 years is stated below

Statement of revenue inflow of the park for the last 10 years.



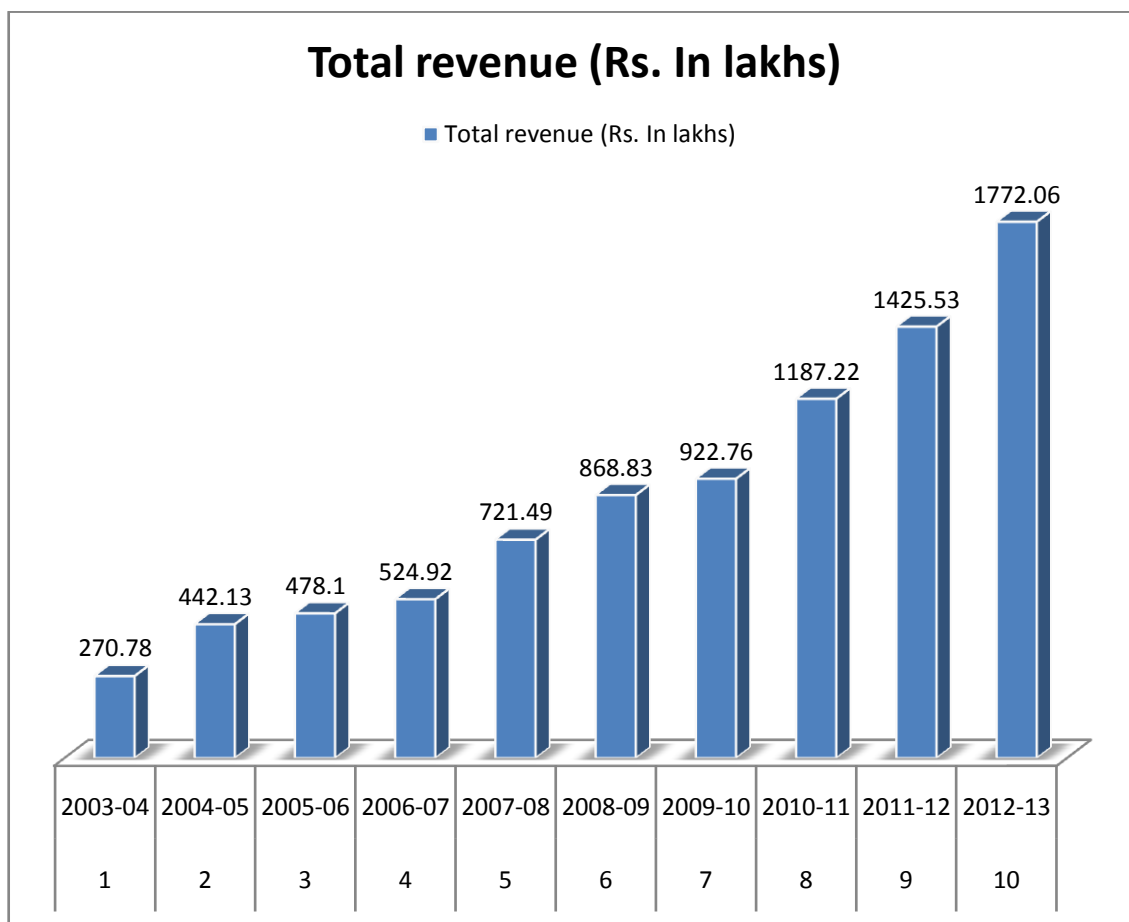
It is estimated around 20% to 25% of the revenue is being increased annually from last five years and assures the same sustainability during the plan period.

The bar chart stated below clearly indicates the sharp rise in revenue in the past 4 years which assures the management that the source of revenue will grow sustainably maintaining the minimum percentage of growth between 20% to 25%. The proposed development plan in adding the new attractive animals would further influence on inflow of visitors which in turn guarantees more revenue. The periodical revision in entrance fees will further contribute into the growth of revenue.

The other revenue oriented activates like parking fee, leases and rent, animal adoption, CSR contributions, sales and donations will also contribute substantially to the growth of park revenue.

In addition, the park authorities will have to explore the possibilities of securing the grants from Zoo Authority of Karnataka, Central Zoo Authority for the regular developmental activities. The other financial support may also be obtained from Government of Karnataka and Government of India towards implementation of

tourism oriented activities in the park for the benefit of visitors. In the past Department of Tourism, Government of India, Department of Bio-Technology, GoI have helped by giving the financial assistance for the development of Butterfly Park and other developmental activities under Master Plan. The financial institutions such as KUIDFC also extended the soft loans for the Development of BBP under Master Plan activities. Therefore there is a tremendous scope to avail the loan facilities for the development of park.

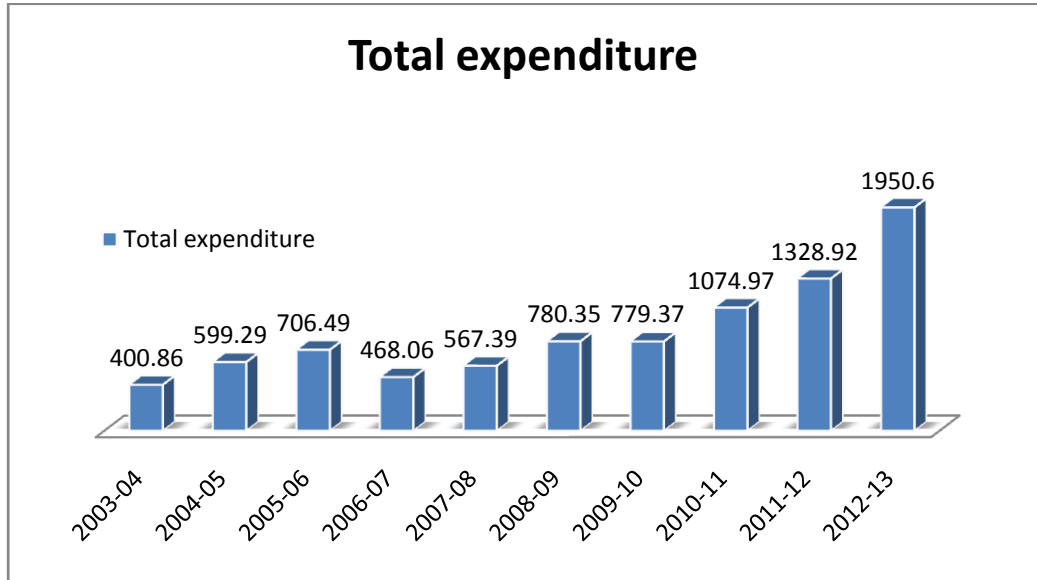


10.4 EXPENDITURE

The major expenditure of the park is mainly for feed & fodder and administrative expenses. It is estimated around 70% of the total revenue is going towards recurring expenditure leaving behind 30% of the revenue towards development and civil maintenance activities. Since the park is not having assured source of financial support either from ZAK or from the government, the internal revenue only the assured source.

The following statement reveals the annual expenditure of the park for the past 10 years.

Statement of expenditure of the park for last 10 year



The annual revenue and expenditure of the park is running parallel and the inflow of revenue is just sufficient for the recurring expenditure only. In absence of any special grants or special packages with a definite financial assistance, the park will miss out the opportunity of growing at par with other developed zoos. Therefore it is highly essential to outsource the possibility of obtaining the financial support for implementing the developmental activities.

10.5 REVENUE PROJECTIONS FOR THE PLAN PERIOD

Based on the past records revenue earning by the Bannerghatta Biological Park and exploring some of the other possibilities to take the financial support for comprehensive development of BBP as per the approved Master Plan, the anticipated revenue is projected as below. During the plan period the 1st phase of 5 years are very crucial from the point of development. The developmental activities listed for implemented during first 05 years will bring the big change to the park as large number of new attractive animal will be added to the inventory apart from providing facilities to the visitors which would stimulate the more visitors to flow in. If the anticipated grants from any of the source are not forthcoming then the choice of availing the loan support shall be explored. This will be availed with the approval of the ZAK from the accredited financial institutions like KUIDFC, KSFC and any

nationalized banks. Under any circumstance no private loans are encouraged and will be avoided.

During the plan period availability of grant in excess of the budget for the particular year if any, the development works listed in the plan period budget will be taken up for execution on priority wise. In case of any deficit in the availability of the grant works will be carried forward to next financial year as spill over works in addition to the works proposed during the year.

Statement of revenue projections during the plan period

Rs. in lakhs				
Sl. No	Source	Details	Anticipated Revenue per year	Anticipated Revenue for the plan period
1	Internal Sources	Gate Revenue (Zoo, Safari and Butterfly Park)	1500.00	30,000.00
		Parking revenue	20.00	400.00
		Leases and rents	30.00	600.00
		Sales	5.00	100.00
		Animal adoption	25.00	500.00
		Corporate Social Responsibility Contributions (CSR)	25.00	500.00
		Donations	25.00	500.00
2	Grants	Zoo Authority of Karnataka Grants	200.00	4000.00
		Central Zoo Authority Grants	-	300.00
		Government Grants (GoK)	100.00	5000.00
		Government Grants (GoI)	100.00	
3	Bank Loans*	On government guarantee		
4	Shares**			
	Loans from government agencies like KUIDFC, KSFC			
			Total	41,900.00

* Based on the need, the loans will be raised from the banks against government guarantee.

** Based on decisions of ZAK, the public shares will be launched in order to ensure financial stability.

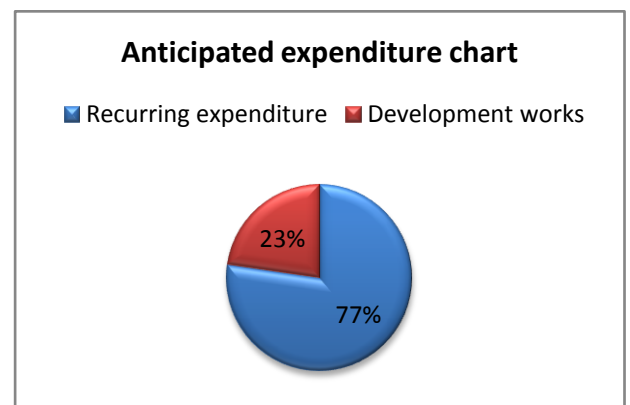
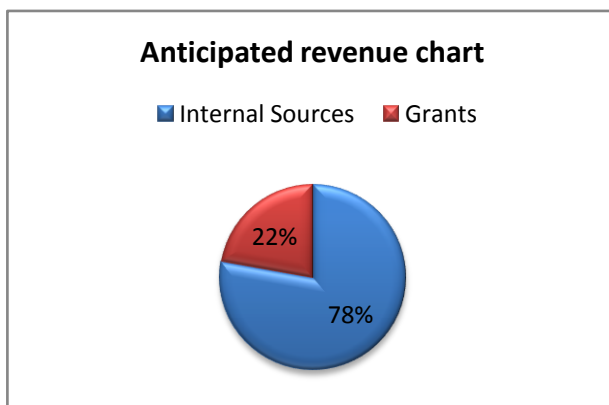
10.6 EXPENDITURE PROJECTIONS FOR THE PLAN PERIOD

The expenditure contemplated in the plan period is directly proportional to the revenue anticipated in the plan period. If the anticipated revenue is affected in any one of the year correspondingly the expenditure also affected result in causing impact on the development. Therefore the management authorities need to evince equal importance on management of both revenue and expenditure as they are complimentary to each other. The anticipated expenditure for the plan period is as stated below.

Statement of expenditure projections during the plan period

Sl. No	Head	Anticipated expenditure per year	Anticipated expenditure per plan period
1	Recurring expenditure	1600.00	32000.00
2	Capital expenditure		9400.00
Total			41400.00

The summary statement of the budget and expenditure contemplated for the plan period appears to be more balanced as the source of revenue and the strength of the revenue earning is more realistic. The anticipated revenue appears to be more than anticipated expenditure.



10.7 CONSTRUCTION AND DEVELOPMENT

Considering the above main proposals in the approved Master Layout Plan, the tentative budget required are derived based on the current schedule of rates. The estimated cost of the works may vary depending on the design, specification and time of implementation.

10.7.1 Zoo

The approved Master Layout Plan of zoo is categorized into 4 sections for the convenient of construction and maintenance. The following structures are to be demolished and their details section wise as follows

10.7.1.1 Enclosures

➤ **Section – 1: Structures to be demolished**

Sl.No	Particulars	Line estimate amount (Rs. In lakhs)
1	Hippopotamus enclosure	2.50
2	Rose ringed parakeet enclosure	0.50
3	Peacock enclosure	0.50
4	Monkey enclosure	0.50
5	Empty enclosure	0.50
6	Old ticket counter	1.50
7	Elephantry	0.50
8	Indian giant squirrel enclosure	0.50
9	Caiman crocodile enclosure	0.50
10	White Peafowl enclosure	0.50
11	Indian porcupine enclosure	0.50
12	Red eared turtle enclosure	0.50
13	Iguana enclosure	0.50
14	Star tortoise enclosure	0.50
15	Cobra enclosure	0.50

16	Rat snake enclosure	0.50
17	King cobra enclosure	0.50
18	RFO Zoo Office building	0.50
19	Information centre building	0.50
	Total	12.50

➤ **Section – 1: Modifications of enclosures**

Sl.No	Particulars	Line estimate amount (Rs. In lakhs)
1	Aquatic bird enclosure	215.00

➤ **Section – 1: New Enclosures**

Sl.No	Particulars	Line estimate amount (Rs. In lakhs)
1	Lion tailed macaque enclosure	80.00
2	Nilgiri Langur enclosure	60.00
3	Common Languar enclosure	55.00
4	Asamese Macaque enclosure	55.00
5	Slender lorries enclosure	45.00
6	Indian Giant squirrel enclosure	25.00
7	Bird Parks (Parrots and Pheasants) enclosure	105.00
	Total	425.00

➤ **Section – 2: Structures to be demolished**

Sl.No	Particulars	Line estimate amount (Rs. In lakhs)
1	Marsh crocodile enclosure	1.00
2	Lion tailed macaque enclosure	0.50
3	Rhesus macaque enclosure	0.30

4	Gharial crocodile enclosure	0.75
5	Jackal enclosure	0.50
6	Mithun enclosure	0.20
7	Indian Wolf enclosure	0.30
8	Leopard enclosure	1.00
9	Wild dog enclosure	0.40
10	Zebra enclosure	0.50
	Total	5.45

➤ **Section – 2: New Enclosures**

Sl.No	Particulars	Line estimate amount (Rs. In lakhs)
1	Aquatic walk through aviary	65.00
2	Leopard cat enclosure	40.00
3	Jungle cat enclosure	40.00
4	Large Indian civet enclosure	55.00
5	Small Indian civet enclosure	40.00
6	Lizards enclosure	25.00
7	Serpentarium	105.00
8	Gharial crocodile enclosure	60.00
9	Marsh crocodile enclosure	60.0
10	Hippopotamus enclosure	115.00
11	Mouse Deer enclosure	25.00
12	Barking Deer enclosure	35.00
13	Sangai Deer enclosure	35.00
14	Hog Deer enclosure	35.00
15	Swamp deer enclosure	35.00
	Total	770.00

➤ **Section – 3: Structures to be demolished**

Sl.No	Particulars	Line estimate amount (Rs. In lakhs)
1	Ostrich enclosure	0.50
2	Emu enclosure	0.35
3	Love birds enclosure	0.30
5	Duck enclosure	0.30
6	Cobra enclosure	0.50
7	Himalayan black bear enclosure	1.00
8	Green shop	0.40
9	Eagle/owl enclosure	0.40
10	Khaleeja pheasants enclosure	0.30
	Total	4.05

➤ **Section – 3: New Enclosures**

Sl.No	Particulars	Line estimate amount (Rs. In lakhs)
1	Himalayan Black bear enclosure	105.00
2	White Tiger enclosure	105.00
3	Olive Baboon enclosure	45.00
4	Hamadrys Baboon enclosure	45.00
5	Wolf enclosure	35.00
6	Wild dog enclosure	35.00
7	Fox enclosure	35.00
8	Hyena enclosure	30.00
9	Jackal enclosure	35.00
10	Otter enclosure	40.00

11	Terrestrial birds park	75.00
	Total	585.00

➤ **Section – 4: New Enclosures**

Sl.No	Particulars	Line estimate amount (Rs. In lakhs)
1	Zebra enclosure	50.00
2	Giraffe/Ostrich	105.00
3	Chimpanzee	70.00
4	Gnu/Eland	45.00
5	African Lion	60.00
6	Hunting Cheetah	85.00
7	Exotic Birds complex	100.00
8	Jaguar	75.00
9	Puma	50.00
	Total	640.00

10.7.1.2 Other development works

Sl. No	Item of Work	Line estimated Cost (Rs in Lakh)
1	Construction of new visitors path for a length 2800 meters	125.00
2	Construction of service road for a length 2250 meters	45.00
3	Underground drainage for a length 2025 meters	25.00
4	Providing water supply distribution pipe line for a length of 3100 meters	18.00
5	Remodeling of existing power supply system	20.00
6	Development of green area	120.00
7	Development of rest places for visitors (9 numbers)	90.00

8	Development of drinking water facilities (9 numbers)	50.00
9	Providing common room facilities for animal keepers at zoo	20.00
10	Construction of zoo hospital complex and facilities	400.00
11	Construction of administrative block	250.00
12	Construction of staff quarters	400.00
13	Establishment of library	10.00
14	Providing water supply from Doddannanakere and from Doddabandekere	210.00
15	Establishment of Effluent Treatment Plant (2 numbers)	100.00
16	Construction of overhead tank (2.50 lakhs liter capacity)	25.00
17	Up gradation of water storage tanks	25.00
18	Up gradation of 4 toilets and construction 2 new toilets	40.00
19	Up gradation of existing buildings (ED office, WADDL lab, Existing Zoo Hospital, Interpretation Centre, 1 st floor of BMTC bus stand)	85.00
20	Up gradation of zoo kitchen	15.00
21	Face-lifting of entry gates and parking area gates	100.00
22	Development of parking area (4 wheeler, 2 wheeler)	150.00
23	Up gradation of CCTV	10.00
24	Research, education and training	150.00
25	Development of Horticulture	50.00
26	Maps and signage's	75.00
27	Creation of food court for visitors	25.00
28	Up gradation of clock room	20.00
29	Procurement of animals/birds	400.00
30	Purchase of vehicles	70.00
31	Development of approach road from Bannerghatta	75.00
32	Establishment of Biodiversity Park	100.00

33	Establishment of Suvarnamukhi Religious Garden	50.00
34	Establishment of Medicinal Plant Garden	60.00
35	Establishment of Orchidarium	50.00
36	Establishment of Arboretum	50.00
37	Miscellaneous	70.00
	Total	3578.00

10.7.2 Safari

Sl.No	Item of Work	Line estimated Cost (Rs in Lakh)
1	Construction of leopard safari	430.00
2	Construction of lion safari	400.00
3	Providing retaining wall to the moat to avoid the entry of elephants around tiger safari	100.00
4	Up gradation of bear safari including animal holding house	65.00
5	Up gradation of tiger safari including animal holding house	75.00
6	Providing partition at Herbivore safari in front of Nature Camp	15.00
7	Providing partition work to bifurcate herbivore safari	20.00
8	Providing feeding platform at herbivore safari (2 numbers)	25.00
9	Up gradation of safari roads (11.50 km length)	120.00
10	Development of water bodies inside the herbivore safari	35.00
11	Development of water bodies inside tiger safari	35.00
12	Up gradation of entry and exit gates	25.00

13	Construction of gate operators shed at entry and exit gates	30.00
14	Development of service road inside safari	50.00
15	Up gradation of Range Forest Officer (Safari) office and veterinary officers field office	25.00
16	Providing common room facilities for animal keepers (5 number)	80.00
17	Miscellaneous	80.00
	Total	1610.00

10.7.3 Elephant Care Centre

Sl. No	Item of Work	Line estimated Cost (Rs in Lakh)
1	Construction of size stone masonry wall around night shelter of 10.00 Ha	100.00
2	Construction of kitchen and feeding house	30.00
3	Construction of approach road inside elephant care centre	10.00
4	Up gradation of Seegadikunte tank	10.00
5	Up gradation of open tanks (Puttanakunte, Venkaiahnakunte, Mulegundekere, Doddannanakere,) in elephant corridor	60.00
	Total	210.00

10.7.4 Conservation and Breeding Centre

Sl. No	Item of Work	Line estimated Cost (Rs in Lakh)
1	Establishment of conservation and breeding centre	350.00
	Total	350.00

10.7.5 Rescue and Rehabilitation Centre

Sl. No	Item of Work	Line estimated Cost (Rs in Lakh)
1	Construction of rehabilitation centre for the dancing bears	280.00
2	Establishment of life care rescue centre for birds	80.00
3	Establishment of life care rescue centre for primates	100.00
4	Establishment of life care rescue centre for mammals	150.00
5	Establishment of life care rescue centre for reptiles	80.00
6	Up gradation of existing lion and tiger block	30.00
	Total	720.00

10.7.6 Butterfly Park

Sl. No	Item of Work	Line estimated Cost (Rs in Lakh)
1	Development of open tank	50.00
2	Development of Bandekere near Butterfly Park	50.00
3	Development of gardens	50.00
4	Development of children play area	50.00
5	Up gradation of host plant garden	50.00
6	Development of insectorium inside the Butterfly Park	25.00
	Total	275.00

10.7.7 Budget Abstract

Sl. No	Unit		Item of Work	Line estimated Cost (Rs in Lakh)
1	Zoo	Section -1	Structures to be demolished	12.50
2	Zoo		Modification of enclosures	215.00
3	Zoo		New enclosures	425.00
4	Zoo	Section -2	Structures to be demolished	5.45
5	Zoo		Modification of enclosures	0
6	Zoo		New enclosures	770.00
7	Zoo	Section -3	Structures to be demolished	4.05
8	Zoo		Modification of enclosures	0
9	Zoo		New enclosures	585.00
10	Zoo	Section -4	Structures to be demolished	0
11	Zoo		Modification of enclosures	0
12	Zoo		New enclosures	640.00
13	Zoo	Development works		3578.00
14	Safari	Development works		1610.00
15	Elephant Care Centre			210.00
16	Conservation and Breeding Centre			350.00
17	Rescue and Rehabilitation Centre			720.00
18	Butterfly Park			275.00
	Total			9400.00

Broad budget out lay for the plan period			
Year 2014-15			
Sl.No	Item of Work	Estimated Cost (Lakh)	Remarks
1	Construction of new visitors path (Section 1, 2, 3)	85.00	
2	Providing underground drainage upto proposed effluent treatment plant (ETP) inside zoo	15.00	
3	Providing water supply distribution pipeline inside zoo	18.00	
4	Construction of Hippopotamus enclosure	115.00	
5	Construction of Himalayan Black Bear enclosure	105.00	
6	Construction of zebra enclosure	50.00	
7	Construction of Giraffe enclosure	105.00	
8	Providing water supply from Doddannanakere and from Doddabandekere	210.00	
9	Development of green areas	50.00	
10	Development of drinking water facilities inside the zoo	30.00	
11	Construction of overhead tank (2.50 lakh capacity)	25.00	
12	Construction of rehabilitation centre for rescued dancing bears	150.00	
13	Establishment of Effluent Treatment Plant (ETP) inside zoo	50.00	
14	Construction of lion safari	100.00	
15	Up gradation of entry and exit gates at safaris	25.00	
16	Construction of gate operators shed at entry and exit gates	30.00	
17	Procurment of animals and birds	100.00	
18	Establishment of Suvarnamukhi Religious Garden	50.00	
	Sub-total	1313.00	

	Year 2015-16		
Sl.No	Item of Work	Estimated Cost (Lakh)	Remarks
1	Construction of aquatic birds enclosures	215.00	
	Development of green areas	30.00	
3	Construction of Lion Tailed Macaque enclosures	80.00	
4	Construction of common langur enclosure	55.00	
5	Construction of wolf enclosure	35.00	
6	Construction wild dog enclosure	35.00	
7	Construction of jackal enclosure	35.00	
	Remodeling of existing power supply system	20.00	
8	Construction of lion safari	300.00	
9	Up gradation of tiger safari including animal holding house	75.00	
10	Construction of rehabilitation centre for rescued dancing bears	130.00	
11	Procurement of animals and birds	60.00	
12	Procurment of vehicles	45.00	
13	Development of Horticulture	15.00	
14	Upgradation of Nature Museum side of Zoo Cafeteria	25.00	
15	Establishment of Interpretation Centre at 1 st floor of BMTC	25.00	
	Sub-total	1180.00	

	Year 2016-17		
Sl.No.	Item of Work	Estimated Cost (Lakh)	Remarks
1	Construction zoo hospital complex	200.00	
2	Construction of birds parks (parrots and pheasants)	105.00	
3	Construction of terrestrial birds park	75.00	
4	Construction of serpentarium	105.00	
5	Development of parking area	150.00	
6	Up gradation of CCTV network	10.00	
4	Up gradation of safari road	120.00	
5	Up gradation of bear safari including animal holding house	65.00	
6	Establishment of Life Care Centre for birds	30.00	
7	Establishment of Life Care Centre for primates	50.00	
8	Establishment of Life Care Centre for mammals	50.00	
9	Construction of size stone masonry wall around night shelter of Elephant Care Centre	100.00	
10	Construction of kitchen and feeding house at Elephant Care Centre	30.00	
11	Construction of approach road inside the Elephant Care Centre	10.00	
12	Upgradation of cloak room	20.00	
13	Development of horticulture garden	35.00	
14	Providing paertion at Herbivore safari infront of nature camp	15.00	
	Sub-total	1170.00	

	Year 2017-18		
Sl.No.	Item of Work	Estimated Cost (Lakh)	Remarks
1	Construction zoo hospital complex facilities	200.00	
2	Construction of Indian Giant Squirrel enclosure	25.00	
3	Construction of mouse deer enclosure.	25.00	
4	Construction barking deer enclosure	35.00	
5	Construction hog deer enclosure	35.00	
6	Construction swamp deer enclosure	35.00	
7	Construction Sangai deer enclosure	35.00	
8	Development of rest places for visitors	90.00	
9	Establishment of conservation breeding centre	200.00	
10	Establishment of life care rescue centers for birds	50.00	
11	Establishment of life care rescue centre for primates	50.00	
12	Establishment of life care rescue centre for mammals	100.00	
13	Development of Bandekere near Butterfly Park	50.00	
14	Construction of leopard safari	180.00	
15	Development of drinking water facilities at zoo	20.00	
16	Maps and signages	50.00	
	Sub-total	1180.00	

Year 2018-19			
Sl.No	Item of Work	Estimated Cost (Lakh)	Remarks
1	Construction of tiger enclosures inside zoo	105.00	
2	Construction of new visitors path balance works	40.00	
3	Construction of service road for the length of 2250 meters.	45.00	
4	Development of green area	40.00	
5	Construction of Nilgiri Languru	60.00	
6	Construction of assamese macaque enclosure	55.00	
7	Construction of slender lorries enclosures	45.00	
8	Construction of aquatic walk through aviary	65.00	
9	Construction of Gharial enclosures	60.00	
10	Construction of Marsh enclosures	60.00	
11	Construction of leopard safari balance works	250.00	
12	Establishment of conservation breeding centre balance works	150.00	
13	Providing partition work to bifurcate herbivore safari	20.00	
14	Providing feeding platform at Herbivore safari	25.00	
15	Construction of administrative block	250.00	
16	Procurement of birds and animals	100.00	
	Sub-total	1370.00	

Year 2019-20			
Sl.No	Item of Work	Estimated Cost (Lakh)	Remarks
1	Construction of Hyena enclosure	30.00	
2	Construction of Chimpanzee enclosure	70.00	
3	Construction of fox enclosure	35.00	
4	Construction of common room facilities for animal keepers at zoo	20.00	
5	Establishment of library	10.00	
6	Providing UGD at Section – 4 of zoo	10.00	
7	Creation of food court for visitors	25.00	
8	Procurement of animals and birds	70.00	
9	Development of insectorium inside the Butterfly Park	25.00	
	Sub-total	295.00	

Year 2020-21			
Sl.No	Item of Work	Estimated Cost (Lakh)	Remarks
1	Construction of Olive Baboon enclosure	45.00	
2	Construction of Hamadrys baboon enclosure	45.00	
3	Construction of Hunting Cheeta enclosure	85.00	
4	Construction of Gnu/Eland enclosure	45.00	
5	Construction of Puma enclosure	50.00	
6	Miscellaneous	15.00	
	Sub-total	285.00	

Year 2021-22			
Sl.No	Item of Work	Estimated Cost (Lakh)	Remarks
1	Construction of staff quarters	100.00	
2	Construction of Jaguar enclosure	75.00	
3	Construction of leopard cat enclosure	40.00	
4	Construction of Jungle Cat enclosure	40.00	
5	Procurement of animals and birds	35.00	
6	Miscellaneous	15.00	
	Sub-total	305.00	

Year 2022-23			
Sl.No	Item of Work	Estimated Cost (Lakh)	Remarks
1	Construction of staff quarters	100.00	
2	Construction of Large Indian Civet enclosure	55.00	
3	Construction of small Indian civet enclosure	40.00	
4	Construction of lizard enclosure	25.00	
5	Procurement of animals and birds	35.00	
6	Miscellaneous	15.00	
	Sub-total	270.00	

Year 2023-24			
Sl.No	Item of Work	Estimated Cost (Lakh)	Remarks
1	Construction of African Lion enclosure	60.00	
2	Construction of exotic birds complex	100.00	
3	Construction of staff quarters	100.00	
4	Miscellaneous	15.00	
	Sub-total	275.00	

Year 2024-25			
Sl.No	Item of Work	Estimated Cost (Lakh)	Remarks
1	Construction of Otter enclosure	40.00	
2	Upgradation of existing ED office, WADDL, Existing Zoo Hospital	35.00	
3	Construction of staff quarters	100.00	
4	Upgradation of toilets (4 nos.)	10.00	
5	Reserch education and training	50.00	
6	Upgradation of zoo kitchen	15.00	
7	Miscellaneous	15.00	
	Sub-total	265.00	

Year 2025-26			
Sl.No	Item of Work	Estimated Cost (Lakh)	Remarks
1	Facelifting of entry gates and parking area gates	100.00	
2	Development of water bodies inside herbivore safari	35.00	
3	Development of host plant garden	50.00	
4	Reserch education and training	50.00	
5	Miscelleneous	15.00	
	Sub-total	250.00	

Year 2026-27			
Sl.No	Item of Work	Estimated Cost (Lakh)	Remarks
1	Establishment of Bio-diversity park	100.00	
2	Development of water bodies inside tiger safari	35.00	
3	Development of service road inside safari	50.00	
4	Development of open tank inside Butterfly Park	50.00	
5	Miscelleneous	15.00	
	Sub-total	250.00	

Year 2027-28			
Sl.No	Item of Work	Estimated Cost (Lakh)	Remarks
1	Upgradation of water storage tanks at zoo	25.00	
2	Providing common room facilities for animal keepers (5 numbers)	80.00	
3	Development of garden at Butterfly Park	50.00	
4	Miscellaneous	15.00	
	Sub-total	220.00	

Year 2028-29			
Sl.No	Item of Work	Estimated Cost (Lakh)	Remarks
1	Establishment of Medical Plant Garden	60.00	
2	Upgradation of Seegadekunte tank	10.00	
3	Establishment of life care centre for reptiles	80.00	
4	Miscellaneous	15.00	
	Sub-total	165.00	

Year 2029-30			
Sl.No	Item of Work	Estimated Cost (Lakh)	Remarks
1	Development of approach road from Bannerghatta to BBP	75.00	
2	Reserch, education and training	50.00	
3	Construction of new toilet	30.00	
4	Miscelleneous	15.00	
	Sub-total	170.00	


Year 2030-31			
Sl.No	Item of Work	Estimated Cost (Lakh)	Remarks
1	Estalishmnet of Orchidarium	50.00	
2	Upgradation of RFO Safari Office	25.00	
3	Upgradation of open tanks (Puttanakunte, Venkaiahnakunte, Mulegundikere, Doddannanakere) in elephant corridor	60.00	
4	Upgradation of existing lion and tiger block in Rescue Centre	30.00	
5	Miscelleneous	11.00	
	Sub-total	176.00	

Year 2031-32			
Sl.No	Item of Work	Estimated Cost (Lakh)	Remarks
1	Estalishmnet of Arboretum	50.00	
2	Development of children play area in Butterfly Park	50.00	
3	Providing retaining wall to the moat to avavoid the entry f elephants around tiger safari	50.00	
	Sub-total	150.00	


Year 2032-33			
Sl.No	Item of Work	Estimated Cost (Lakh)	Remarks
1	Providing retaining wall to the moat to avavoid the entry of elephants around tiger safari.	50.00	
2	Effluent Treatment Plant	50.00	
3	Miscelleneous	11.00	
	Sub-total	111.00	

CHAPTER – IX

Annexure to the Master Plan



GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT & FORESTS
Central Zoo Authority



F. No. 19-80/92-CZA(125)(Vol. IX)(M) / 5159

DATE: 24.06.2014

To

The Executive Director
Bannerghatta Biological Park,
Bangalore (Karnataka).

Sub:- Master Plan of the Bannerghatta Biological Park, Bangalore and designs for the construction of Tiger enclosure at Bannerghatta Biological Park, Bangalore.

Sir,

The Master Plan of the Bannerghatta Biological Park, Bangalore and the designs for the construction of Tiger enclosure were placed before the members of the Expert Group on Zoo Designing of the Central Zoo Authority in its meeting held on 5th June, 2014 and following decisions were taken:-

Master Plan

The Master Plan scrutinized and recommended for approval subject to the following observations:-

- i. There should be a Forword from the Chief Wildlife Warden, Government of Karnataka and Preface should be written by the Member Secretary, Zoo Authority of Karnataka and Executive Summary may be written by Executive Director, Bannerghatta Biological Park, Bengaluru.
- ii. On page 196, the point no. 2 should be read as "fool proof arrangement to prevent the entry of rodents inside the animal enclosure as well as in animals' cell".
- iii. No slides and swings to be provided in the children corner instead, some equipment which can entertain the children as well as make them aware about the behaviour, biology and ecological importance of wild animals may be provided.


Designs for the construction of Tiger enclosure


The design was scrutinized and not approved. The design of the Tiger exhibit of Zoo and Rescue Centre, Mukundpur, Satna is enclosed herewith for your reference

Yours faithfully,
sd/-
(B. S. Bonal)
Member Secretary

Encl: as above

Copy to the Chief Wildlife Warden, Government of Karnataka, Bangalore for favour of information.





(Inder Dhamija)
DIG (Hqr.)

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GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT & FORESTS

Central Zoo Authority



F. No. 19-80/92-CZA(125)(Vol. VIII)(M) / 5005

DATE: 03.06.2014

To
The Executive Director
Bannerghatta Biological Park,
Bengaluru (Karnataka).

Sub:- Revised Master Plan of the Bannerghatta Biological Park, Bengaluru.

Ref:- Your office letter No. A2/BBP/Master Plan/ 2014-15 dated 08.05.2014.

Sir,

Reference is invited to the above cited correspondence.

The revised Master Plan of the Bannerghatta Biological Park, Bengaluru was scrutinized by the members of the Expert Group on Zoo Designing of the Central Zoo Authority and the following observations were made:-

- There should be Foreword from the Chief Wildlife Warden, Government of Karnataka and Preface should be written by the Member Secretary, Zoo Authority of Karnataka and Executive Summary may be written by Executive Director, Bannerghatta Biological Park, Bengaluru.
- On page 196, the point no. 2 should be read as "fool proof arrangement to prevent the entry of rodents inside the animal enclosure as well as in animals' cell".
- No slides and swings to be provided in the children corner instead, some equipment which can entertain the children as well as make them aware about the behaviour, biology and ecological importance of wild animals may be provided.

Keeping in view of the above, you are requested to revise the Master Plan and submit three amended copies to this Authority for further scrutiny/ approval at our end.

Yours faithfully,


(Inder Dhamija)
DIG (Hqr.)

Copy to the Chief Wildlife Warden, Government of Karnataka, Bangalore for favour of information.

(Inder Dhamija)
DIG (Hqr.)

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GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT & FORESTS
Central Zoo Authority



F. No. 19-80/92-CZA(125)/4603

Date: 07. 04. 2014

To,

Executive Director,
Bannerghatta Biological Park,
Bannerghatta,
Bengaluru,
Karnataka.

Sub: - Submission of master plan for long term development of Bannerghatta Biological Park, Bengaluru. – Regarding.

Ref: - Your letter No. F/WL/Master Plan/CZA/2013-14 dated 17.03.2014.

Sir,

Reference is invited to the aforesaid correspondence.

The master plan of the Bannerghatta Biological Park, Bengaluru has been scrutinized by the members of Expert Group on Zoo Design, CZA and the observations have been marked in the enclosed copy. You are requested to carry out the necessary amendments and submit a revised copy of master plan to this office for its approval and scrutiny.

Yours faithfully,

(Dr. Brij Kishor Gupta)
Evaluation and Monitoring Officer

Encl. As above

Copy to: Chief Wildlife Warden, Government of Karnataka, Bengaluru for
favour of information.

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GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT & FORESTS
Central Zoo Authority



THROUGH REGISTERED POST

F. No. 19-80/92-CZA(125)(Vol. VIII)(M) 4235 DATE: 28.01.2014

To

The Executive Director
Bannerghatta Biological Park,
Bangalore – 560 003 (Karnataka).

Sub:- Master (layout) Plan of the Bannerghatta Biological Park, Bangalore.

Sir,

Reference is invited to your letter No. A2/BBP/Master Layout Plan/2013-14 dated 28.12.2013.

The Master (layout) Plan of the Bannerghatta Biological Park, Bangalore was placed before the 46th Meeting of the Expert Group on Zoo Designing of the Central Zoo Authority held on 3rd January, 2014. After detailed deliberation, the design was approved subject to the following:-

The Layout Plan of Bannerghatta Biological Park with various component were examined and decided as below:-

1. **Layout plan for Safari and Rescue Centre** : It is recommended for approval with following changes:
 - a) The entry into the jungle lodges will be from outside the herbivore safari and there will be no entry gate from the herbivore safari into the jungle house.
 - b) The kitchen for the elephant night house will be shifted further away from the visitor road.
 - c) All the rescued bears will be shifted to the rescue area and the entire area occupied by bear & rescue centre will be part of the bear safari.



Bannerghatta Biological Park (Zoo) : Layout Plan of the Bannerghatta Biological Park (Zoo) is recommended for approval with the changes that instead of White tiger, the enclosure will be a tiger enclosure where the white or normal both tigers can be kept, if required.

...2/-

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3. **Butterfly Park :-**

No change is suggested for the butterfly park.

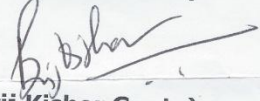
4. As far as maps for the Bannerghatta Biological Park is concerned, there should be one map compassing all the units like zoo, butterfly park and the safari and details of the each unit should be given separately.

5. The proposed aquarium is to be done away.

**Yours faithfully,
sd/-
(B. S. Bonal)
Member Secretary**

Copy to the Chief Wildlife Warden, Government of Karnataka, Bangalore for favour of information.

Forwarded by



**(Dr. Brij Kishor Gupta)
Evaluation and Monitoring Officer**



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GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT & FORESTS

Central Zoo Authority



THROUGH REGISTERED POST

F. No. 19-80/92-CZA(125)(Vol. VIII)(M) / 2736

DATE: 06.05.2013

To

The Executive Director
Bannerghatta Biological Park,
Bangalore (Karnataka).

**Sub:- Revised Master (layout) Plan of the Bannerghatta Biological Park,
Bangalore.**

Sir,

The revised Master (layout) Plan of the Bannerghatta Biological Park, Bangalore was placed before the Meeting of the Expert Group on Zoo Designing of the Central Zoo Authority held on 23rd April, 2013.

After detailed deliberation, it was decided that the Bannerghatta Biological Park should submit the Master (layout) Plan in total including Zoo, Safari, Rescue Centres and Butterfly Park. Recommendation for approval of the layout plan shall be communicated once the layout plan of Biological Park as a whole is received. However, the committee after scrutiny of the layout plan of the zoo area (part of BBP) recommended for its approval.



488
9/5/2013

Yours faithfully,

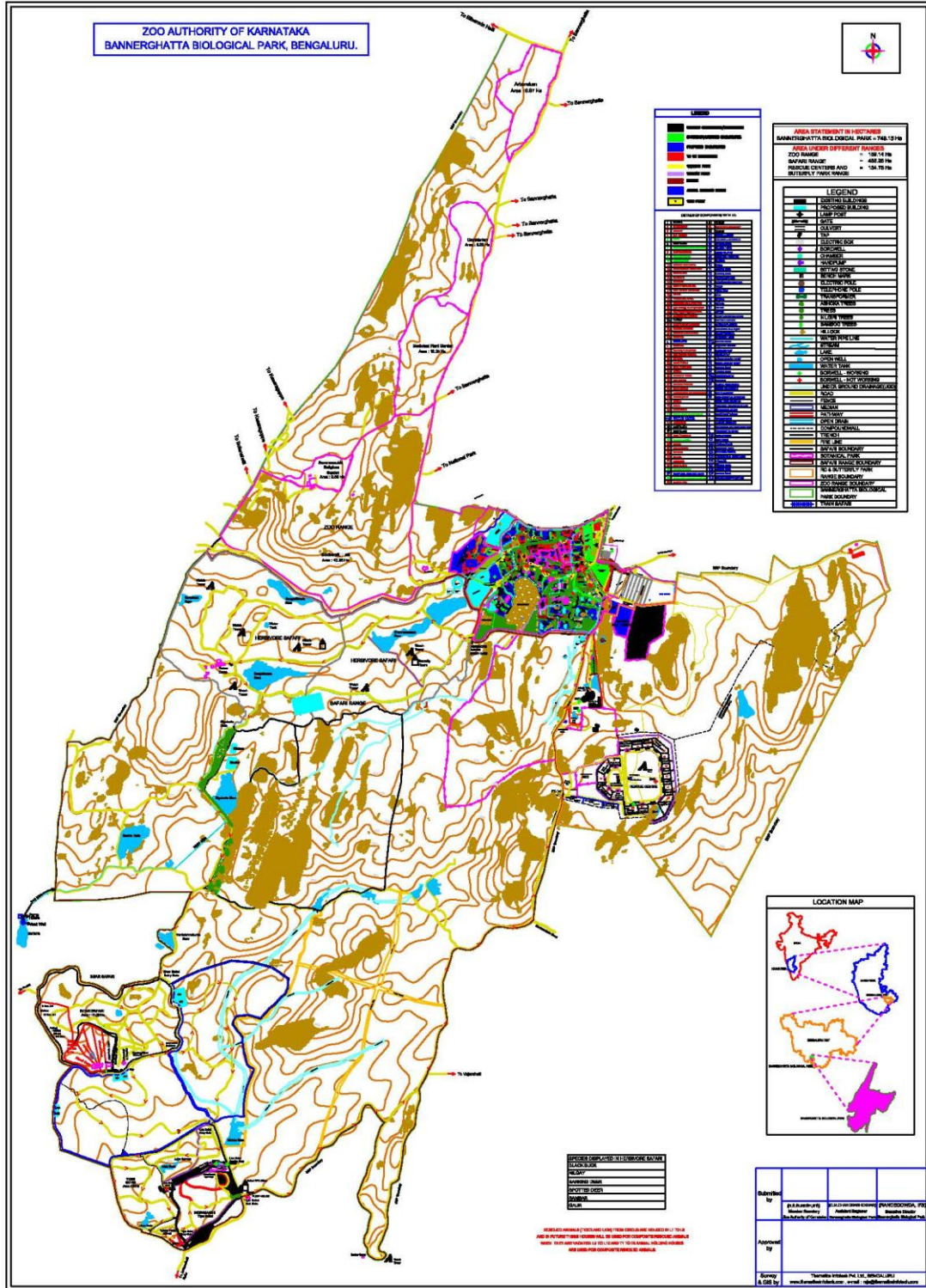
(B. S. Bonal)
Member Secretary

Copy for favour of information and necessary action to:-

1. The Chief Wildlife Warden, Karnataka, Bangalore.
2. The Member Secretary, Zoo Authority of Karnataka, Mysore.

(B. S. Bonal)
Member Secretary

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Contour map of BBP



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GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT & FORESTS
Central Zoo Authority



F. No. 19-80/92-CZA(125)(Vol. VIII)(M)/2505

DATE: 01.04.2013

To

The Executive Director
Bannerghatta Biological Park,
Bengaluru (Karnataka).

Sub:- Master (layout) Plan of the Bannerghatta Biological Park, Bengalure.

Sir,

The Master (layout) Plan of the Bannerghatta Biological Park, Bengaluru – Zoo Section was finalized in consultation with Sh. S. C. Sharma, Retd. Addl. DGF (W), MoEF, Mr. Kartick Satyanarayan, Member, CZA, Dr. Brij Kishor Gupta, Evaluation & Monitoring Officer, CZA, Dr. R. Raju, Director on 6th – 7th March 2013 and other officers of the Zoo with a view to ensure following points:-

1. Approach to cafeteria, directly from the main entry to the zoo, even before visitors entering the zoo has to be avoided. Green buffer all around the cafeteria has to be done. Only small part of the cafeteria should be used, rest of the building should be used educate and apprise the visitors regarding the in situ conservation in Karnataka and its linkages with zoo.
2. A minor adjustment is required in the proposed periphery fence of the zoo to ensure that migratory route of wild elephants is not impacted.
3. The water body which falls in the National Park but it is just next to visitors path should be converted into the natural wetland which could viewed both by National Park visitors as well as Zoo Visitors. Measures to attract free ranging birds in this area would be taken. Boating has to be stopped.
4. The visitor pathway has been aligned in such a way that visitors get exposure to India fauna before reaching the exotic animals. Efforts have been made to adopt taxonomical theme.
5. Service road has been aligned in such a way that it does not run parallel/overlap with the visitor path at any point but crossing at some points is unavoidable.
6. The authorities have been guided to design the viewing areas and feeding/retiring cells in such a way that visitors do not see the feeding cells.



Engineer
Bannerghatta

...2/-

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7. While designing the animal enclosures, precaution has to be taken to ensure that excessive use of RCC and steel is avoided. So far it has been observed that there is tendency to over use the RCC and cement concrete at the gate and parking area.
8. For approval of the layout plan, the zoo authorities have to take detailed review of the Safaris and the Rescue Centre. Following observations are important in this regards:
 - a. The entry gate and feeding of Tiger Safari are too close that at times visitors view the feeding from close distance, while the gate is being operated.
 - b. Some of the feeding cells have become old and may need renovation/replacement.
 - c. Road path may also need some realignment.
 - d. The number of animals has to be kept limited within the carrying capacity of the area i.e. to not more than 10-15 tigers/lions in Tiger Safari/Lion Safari and not more than 20 Gaurs and 100 deer species in Herbivore Safari.
 - e. There is no point in having an Elephant Safari, if the elephants are kept chained. The Zoo Authorities have to muster courage to keep in the Safari the elephants that are not chained. This would need technical support to monitor possibilities of musth and handle the elephants in musth or else they should keep elephant camp only. The minimum area for Elephant Safari should be of 50 hectares.
 - f. Bear Safari should have only such bears where human impacting is minimal i.e. the bears rescued from wild. Other bears including *kalandar* bears and bears from other zoos should be housed in rescue centre. The same principle shall apply to Panther Safari too.
9. The detailed design of hospital/veterinary facility centre has to be prepared and got approved from Central Zoo Authority. The facility should have isolation, quarantine and impatient wards, post-mortem room, Operation Theater, Laboratory, Medicine Room, Doctors room etc.
10. Incinerator of appropriate size should be installed at the earliest opportunity. The present system of disposal of animals and bones is unhygienic and invites feral dogs in the zoo premises.
11. The water of drainage should not be allowed to into the water bodies of Zoo or National Park. Sewage pipe lines have to be connected with Municipal Sewage Trunk Line near the Zoo.
12. Some facilities for interpretation on the spot through innovative devices should be installed near the enclosures and visitors educated through by those devices.
13. The Bonnet macaques are serious menace, the feeding kraals of all the herbivores should be covered from top.

...3/-

14. It has been seen that some new facilities have come up while master plan is in process. Any construction future should be done strictly in accordance to the approved master plan from Central Zoo Authority.
15. Since Zoo is getting large number of carnivores as rescued animals, they may transfer the circus animals to other rescue centres in consultation with Central Zoo Authority.
16. Provision for housing Rescued Bears also has to make in the master layout and master plan and this should be constructed on priority.
17. Conservation Breeding Area has to be provided at an appropriate place.
18. The Zoo Authorities have been directed not to have many circles (round about) on the visitor path.
19. The position of mounds as shown in animal exhibits ca not be decided in the enclosures at this stage. This will be decided while finalizing the design of the individual animal enclosures, so mound should be shown in the enclosure for time being. Director has been already requested to ensure this.

You are hereby requested to submit the amended copy of the Master (layout) Plan and Master Plan of the Bannerghatta Biological Park, Bengaluru incorporating the above observations and submit separate layout plan for Safaris, Rescue Centre, Hospital, Conservation Breeding Centres and Butterfly House should be submitted.

Yours faithfully,


(B. S. Bonal)

Member Secretary

Copy to the Chief Wildlife Warden, Government of Karnataka, Bengaluru for favour of information.

(B. S. Bonal)
Member Secretary



GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT & FORESTS
Central Zoo Authority



F. No. 19-80/92-CZA (125)(Vol. VIII)(M)/2477 DATE: 25.03.2013

✓ To

The Executive Director
Bannerghatta Biological Park,
Bangalore (Karnataka).

**Sub:- Animal Collection Plan of the Bannerghatta Biological Park,
Bangalore.**

Sir,

Please find herewith the Animal Collection Plan of the Bannerghatta Biological Park, Bangalore after scrutiny by Sh. S. C. Sharma Member, Expert Group on Zoo Designing of the Central Zoo Authority for the appropriate action at your end.

Yours faithfully,
sd/-
(B. S. Bonal)
Member Secretary

Encl: as above

Copy for favour of information to:-

1. The Chief Wildlife Warden, Government of Karnataka, Bangalore.
2. The Member Secretary, Zoo Authority of Karnataka, Mysore



(Dr. Brij Kishor Gupta)
Evaluation and Monitoring Officer

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Bannerghatta Biological Park -Animal Collection Plan

S.N	Species	Present stock with zoo				Minimum Animals Required				Optimum number of Animals				Animals to be acquired or removed				Remarks
		M	F	U	T	M	F	U	T	M	F	U	T	M	F	U	T	
Mammals																		
1	Macaque Assamese : <i>Macaca assamensis</i>	0	0	0	0	2	3	0	5	4	6	0	10	2	3	0	5	To be acquired
2	Macaque Rhesus : <i>Macaca mulatta</i>	2	6	0	8	0	0	0	0	0	0	0	0	-2	-6	0	-8	To be taken of Display
3	Common or Hanuman Langour: <i>Presbytis entellus</i>	1	3	0	4	2	3	0	5	4	6	0	7	1	0	0	1	To be acquired
4	Nilgiri Langour: <i>Presbytis thoni</i>	0	0	0	0	2	3	0	5	4	6	0	10	2	3	0	5	To be acquired
5	Lion Tailed Macaque: <i>Macaca silenus</i>	1	1	0	2	2	3	0	5	4	6	0	10	1	2	0	3	To be acquired
6	Rhess Macaque	2	6	0	8	0	0	0	0	0	0	0	0	-2	-6	0	-8	To be transferred
7	Slender loris: <i>Loris tardigradus</i>	0	0	0	0	2	3	0	5	4	6	0	10	2	3	0	5	To be acquired
8	Mouse Deer: <i>Tragulus memina</i>	0	1	0	1	2	3	0	5	4	6	0	10	2	2	0	4	To be acquired
9	Indian Giant Squirrel - <i>Ratufa indica</i>	1	2	0	3	2	3	0	5	4	6	0	10	1	1	0	2	To be acquired
10	Leopard cat	0	0	0	0	2	3	0	5	4	6	0	10	2	3	0	5	To be acquired
11	Jungle cat	0	0	0	0	2	3	0	5	4	6	0	10	2	3	0	5	To be acquired
12	Great Indian Civet/Small Indian Civet	0	0	0	0	2	3	0	5	4	6	0	10	2	3	0	5	To be acquired
13	Toddy Cat : <i>Paradoxurus hemaphysodes</i>	1	1	2	4	2	3	0	5	4	6	0	10	1	2	-2	1	To be acquired
14	Leopard : <i>Panther pardus</i>	13	12	0	25	2	3	0	5	4	6	0	10	-9	-6	0	-15	Only animals of wild origin to kept on
15	Tiger - Royal Bengal:- <i>Panthera tigris tigris</i>	21	19	0	40	2	3	0	5	14	6	0	20	-7	-13	0	-20	Only animals of wild origin to kept on
16	White Tiger-Royal Bengal- <i>Panthera tigris tigris</i>	4	3	0	7	2	3	0	5	4	6	0	10	0	3	0	3	By breeding

Bannerghatta Biological Park -Animal Collection Plan

S.N	Species	Present stock with zoo				Minimum Animals Required				Optimum number of Animals				Animals to be acquired or removed				Remarks	
		M	F	U	T	M	F	U	T	M	F	U	T	M	F	U	T		
17	Lion - Asiatic:- <i>Panthera leo persica</i>	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	-1	To be moved to some other Zoo since Zoo has no space to house
18	African Lion :- <i>Panthera leo leo</i>	0	0	0	0	2	3	0	5	4	6	0	10	2	3	0	5	0	To be acquired
19	Lion - Hybrid <i>Panthera leo</i>	16	15	0	31	2	3	0	5	16	15	0	31	0	0	0	0	0	Circus Lion not to be
20	Himalayan Black Bear : <i>Selenarctos thibetanus</i>	4	2	0	6	2	3	0	5	4	6	0	10	0	4	0	4	4	Minimum 1 female to be acquired as
21	Sloth Bear:- <i>Melursus ursinus</i>	18	17	0	35	2	3	0	5	4	6	0	10	-14	-11	0	-25	0	Only animals of wild origin to kept on
22	Jackal : <i>Canis aureus</i>	2	4	0	6	2	3	0	5	4	6	0	10	2	2	0	4	4	By breeding
23	Grey Wolf	3	0	0	3	2	3	0	5	4	6	0	10	-1	3	0	2	2	Minimum 2 females to be acquired as
24	Heyna	0	0	0	0	2	3	0	5	4	6	0	10	2	3	0	5	5	aquisition
25	Wild Dog	2	0	0	2	2	3	0	5	4	6	0	10	0	3	0	3	3	Female to be acquired
26	Indian Elephant	5	9	0	14	2	3	0	5	4	6	0	10	-1	-3	0	-4	0	Exchange/Transfer
27	Barking Deer : <i>Muntiacus muntjak</i>	2	3	0	5	2	3	0	5	4	6	0	10	2	3	0	5	5	By breeding
28	Swam Deer	0	0	0	0	2	3	0	5	4	6	0	10	2	3	0	5	5	aquisition
29	Sanghal-Thamin deer	3	4	0	7	2	3	0	5	4	6	0	10	1	2	0	3	3	By breeding
30	Black Buck : <i>Antelope cervicapra</i>	7	14	0	21	2	3	0	5	6	14	0	20	-1	0	0	-1	-1	
31	Chinkara	1	0	0	0	0	0	0	0	0	0	0	0	-1	0	0	-1	-1	To be transferred

Bannerghatta Biological Park -Animal Collection Plan

S/N	Species	Present stock with zoo						Minimum Animals Required						Optimum number of Animals						Animals to be acquired or removed						Remarks
		M	F	U	T	M	F	U	T	M	F	U	T	M	F	U	T	M	F	U	T					
32	Nilgai or Blue Bull:- <i>Boselaphus tragocamelus</i>	3	5	0	8	2	3	0	5	6	14	0	20	3	9	0	12	By breeding								
33	Sambar:- <i>Cervus unicolor</i>	88	90	0	178	2	3	0	5	30	70	0	100	-58	-20	0	-78	to be released in the fr								
34	Hog Deer: <i>Axis Porcinus</i>	4	8	0	12	2	3	0	5	6	14	0	20	2	6	0	8	By breeding								
35	Gaur or Indian Bison:- <i>Bos gaurus</i>	5	2	0	7	2	3	0	5	5	5	0	10	0	3	0	3	Aquisition								
36	Porcupine : <i>Hystrix Indica</i>	3	2	5	10	2	3	0	5	4	6	0	10	1	4	-5	0	By breeding								
37	Mithun: <i>Bos Frontalis</i>	0	1	0	1	0	0	0	0	0	0	0	0	0	-1	0	-1	To be taken offdispay								
38	Otter	0	0	0	0	2	3	0	5	4	6	0	10	2	3	0	5	aquisition								
Total - mammals		213	250	7	449	66	99	0	165	187	294	0	478	-60	13	-7	-54									
Mammals Exotic																										
Saaias																										
1	Marmosets : Callimico goeldii	1	0	0	1	0	0	0	0	0	0	0	0	-1	0	0	-1	To be taken offdispay/								
2	Hippopotamus : <i>Hippopotamus amphibius</i>	2	5	0	7	2	3	0	5	2	5	0	7	0	0	0	0									
3	Zebra : <i>Equas burchelli</i>	1	0	0	1	2	3	0	5	4	6	0	10	1	3	0	4	aquisition								
4	Chimpanzee	0	0	0	0	2	3	0	5	4	6	0	10	2	3	0	5	aquisition								
5	Hamadryas Baboons	1	2	3	6	2	3	0	5	4	6	0	10	3	4	-3	4	By breeding								
6	Olive Baboons	0	0	0	0	2	3	0	5	4	6	0	10	2	3	0	5	aquisition								
7	Giraffe	0	0	0	0	2	3	0	5	4	6	0	10	2	3	0	5	aquisition								

Proposed animal collection plan of BBP

Bannerghatta Biological Park - Animal Collection Plan

S.N	Species	Present stock with zoo			Minimum Animals Required			Optimum number of Animals			Animals to be acquired or removed			Remarks				
		M	F	U	T	M	F	U	T	M	F	U	T					
8	Gnu/Eland	0	0	0	0	2	3	0	5	4	6	0	10	2	3	0	5	acquisition
9	Hunting Chetha	0	0	0	0	4	6	0	10	4	6	0	10	4	6	0	10	acquisition
10	Jaguar	0	0	0	0	2	3	0	5	4	6	0	10	2	3	0	5	acquisition
11	Puma	0	0	0	0	2	3	0	5	4	6	0	10	2	3	0	5	acquisition
Total Mammals Exotic Species		5	7	3	15	22	33	0	55	38	59	0	97	19	31	-3	47	
Grand Total Mammals		248	237	10	464	88	52	0	146	93	132	0	575	44	110	-10	17	
Birds																		
1	Great Indian Horn bill : <i>Buceros vicoznis</i>	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	-1
2	Pea fowl Indian : <i>Pavo cristatus</i>	0	1	0	1	2	3	0	5	2	3	0	5	2	2	0	4	
3	Pea fowl white : <i>Pavo cristatus</i>	2	5	0	7	2	5	0	7	2	5	0	7	0	0	0	0	
4	Spoon bill : <i>Platalea leucorodia</i>	2	2	1	5	4	6	0	10	4	6	0	10	2	4	-1	5	
5	Kalji Pheasant: <i>Lophus leucomehana</i>	1	0	0	1	0	0	0	0	0	0	0	0	-1	0	0	-1	To be deleted
6	Fowl Jungle Grey : <i>Gallus sonnerati</i>	1	0	0	1	2	3	0	5	2	3	0	5	1	3	0	4	acquisition
7	Red Jungle Fowl:	2	0	0	2	2	3	0	5	2	3	0	5	0	3	0	3	acquisition
8	Barn Owl : <i>Tyto alba</i>	0	0	1	1	0	0	0	0	0	0	0	0	0	0	-1	-1	
9	Long eared Owl : <i>Asio otus</i>	2	1	0	3	2	3	0	5	4	6	0	10	0	2	0	2	

Bannerghatta Biological Park - Animal Collection Plan

S.N	Species	Present stock with zoo				Minimum Animals Required				Optimum number of Animals				Animals to be acquired or removed				Remarks
		M	F	U	T	M	F	U	T	M	F	U	T	M	F	U	T	
10	Parakeet alexandrine : <i>Psittacula</i>	1	3	0	4	2	3	0	5	4	6	0	10	1	0	0	1	
11	Parakeet rose ring : <i>Psittacula k</i>	17	4	0	21	2	3	0	5	4	6	0	0	-13	2	0	-11	
12	Baya Weaver : <i>Ploceus phillinus</i>	0	0	2	2	0	0	0	0	0	0	0	0	0	0	-2	-2	
13	Heron Night : <i>Nyctocorax nyctic</i>	0	0	2	2	2	3	0	5	4	6	0	10	2	3	-2	3	
14	Ibis White : <i>Threskiornis actio</i>	20	35	0	55	4	6	-	10	6	14	-	20	-14	-21	0	35	Exchange
15	Munia Black Headed : <i>Lonchura</i>	1	5	0	6	0	0	0	0	0	0	0	0	-1	-5	0	-6	
16	Stork painted : <i>Mycteria leucoc</i>	2	2	0	4	0	2	0	2	0	2	0	2	-2	0	0	-2	
17	Grey Pelican : <i>Pelecanus philipp</i>	5	5	0	10	5	5	0	10	6	14	0	20	1	9	0	10	By breeding
18	Red crested pochard : <i>Netta ruf</i>	17	14	0	31	4	6	0	10	6	14	0	20	-11	0	0	-11	
19	Chines ring necked Pheasant : <i>Phasianus colchicus torquatus</i>	2	4	0	6	4	6	0	10	4	6	0	10	2	2	0	4	By breeding
20	Silver Pheasant : <i>Lophra nycthemera nyxtenera</i>	2	1	0	3	2	3	0	5	2	3	0	5	0	2	0	2	Aquistion
21	Golden Pheasant : <i>Chrysolophu</i>	5	5	0	10	4	6	0	10	4	6	0	10	-1	1	0	0	Exchange
22	Lady Amherst's Pheasant : <i>Chrysolophus amherstiae</i>	2	4	0	6	4	6	0	10	4	6	0	10	2	2	0	4	By breeding
23	Black Swan	0	1	0	1	2	3	0	5	2	3	0	5	2	2	0	4	
24	Green Winged Macaws : <i>P.Chloropterus</i>	1	1	0	2	1	3	0	4	1	3	0	4	0	2	0	2	
25	Emu : <i>Dromaius novaehollandia</i>	2	2	0	4	0	2	0	2	0	2	0	2	-2	0	0	-2	
26	Ostrich : <i>Struthio Camelus</i>	3	4	0	7	4	6	0	10	4	6	0	10	1	2	0	3	By breeding

Proposed animal collection plan of BBP

Bannerghatta Biological Park -Animal Collection Plan

S.N	Species	Present stock with zoo						Minimum Animals Required						Optimum number of Animals						Animals to be acquired or removed						Remarks	
		M	F	U	T	M	F	U	T	M	F	U	T	M	F	U	T	M	F	U	T						
27	Rhea	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
28	Orange Winged Amazon Parakeet	2	2	0	4	2	3	0	5	2	3	0	5	0	1	0	1	0	1	0	1	0	1	0	1		
29	Sun Conure	1	1	0	2	2	3	0	5	2	3	0	5	1	2	0	3	0	3	0	3	0	3	0	3		
30	Crowned Crane	3	1	0	4	2	3	0	5	2	3	0	5	-1	2	0	1	0	1	0	1	0	1	0	1		
31	Cockatiels :	1	1	0	2	2	3	0	5	2	3	0	5	1	2	0	3	0	3	0	3	0	3	0	3		
32	Love Birds	8	7	0	15	0	0	0	0	0	0	0	0	-8	-7	0	-15	0	-15	0	-15	0	-15	0	-15	To be taken off display	
33	coackateel	48	45	0	93	0	0	0	0	0	0	0	0	-48	-45	0	-93	0	-93	0	-93	0	-93	0	-93		
Total -Birds		154	158	6	318	62	98	0	160	75	135	0	200	-65	-32	-6	-53										
Reptiles																											
1	Crocodile long snouted Gharial: <i>Gravialis gangeticus</i>	0	0	0	0	2	3	0	5	4	6	0	10	2	3	0	5										
2	Crocodile Marsh : <i>Crocodylus palustris</i>	0	4	0	4	2	3	0	5	4	6	0	10	2	-1	0	1										
3	Indian Star Tortoise : <i>Geochelone elegans</i>	17	11	0	28	4	6	0	10	6	14	0	20	-11	3	0	-8										
4	Red - eared slider Turtle: <i>Trachemys scripta elegans</i>	4	5	0	9	4	6	0	10	6	14	0	20	0	1	0	1										
5	Indian Mud or Flap shell Turtle: <i>Lissemys punctata</i>	0	0	89	89	4	6	0	10	6	14	0	20	6	14	-89	-69										
6	Batagar Terrapin or River Terrapin: <i>Batagar baska</i>	3	2	0	5	4	6	0	10	6	14	0	20	1	4	0	5										
7	Indian Rock Python : <i>Python molurus</i>	12	8	0	20	4	6	0	10	6	14	0	20	-6	6	0	0										

Proposed animal collection plan of BBP

Bannerghatta Biological Park - Animal Collection Plan

S.N	Species	Present stock with zoo				Minimum Animals Required				Optimum number of Animals				Animals to be acquired or removed				Remarks
		M	F	U	T	M	F	U	T	M	F	U	T	M	F	U	T	
8	Indian Cobra : <i>Naja naja</i>	2	2	0	4	4	6	0	10	6	14	0	20	2	4	0	6	
9	King Cobra: <i>Ophiophagus hannah</i>	10	10	0	20	4	6	0	10	6	14	0	20	-4	4	0	0	
10	Viper Russells : <i>Vipera russelli</i>	1	1	0	2	4	6	0	10	6	14	0	20	3	5	0	8	
11	Rat Snake: <i>Ptyas mucousus</i>	0	0	8	8	4	6	0	10	6	14	0	20	4	6	-8	2	
12	Snake Sand Boa : <i>Eryx conicus</i>	0	0	30	30	4	6	0	10	6	14	0	20	6	14	-30	-10	
13	Common Indian Monitor Lizard: <i>Varanus bengalensis</i>	1	1	0	2	4	6	0	10	6	14	0	20	3	5	0	8	
14	Iguana green	0	0	1	1	4	6	0	10	6	14	0	20	4	6	-1	9	
Total -Reptiles		50	44	128	222	52	78	0	130	80	180	0	260	12	74	-128	-42	



जहाँ है हरियाली।
वहाँ है खुशहाली।।



GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT & FORESTS

Central Zoo Authority



THROUGH SPEED POST

F. No. 19-80/92-CZA(125)(Vol. VII)(M) 1923

DATE: 29.05.2012

30

To

The Executive Director
Bannerghatta Biological Park,
Bangalore (Karnataka).

Sub:- Finalization of the Master Plan of the Bannerghatta Biological Park, Bangalore.

Sir,

Please recall discussions held during visit by Sh. S. C. Sharma, Retd. Addl. DGF (WL), MoEF, Government of India and Dr. Brij Kishor Gupta, Evaluation & Monitoring Officer, CZA, who had carried out the field appraisal of the Bannerghatta Biological Park, Bangalore on 25th April 2012 with respect to the Master Plan of the Zoo, as deputed by the Central Zoo Authority.

The team members have submitted their report indicating various amendments to be carried out in the Master Plan of the zoo. A copy of the report is enclosed herewith for your perusal. You are requested to amend the Master Plan accordingly and submit four copies to this office for further necessary action at our end.

Yours faithfully,

(B. S. Bonal)
Member Secretary

Encl: as above

Copy for favour of information to:-

1. The Chief Wildlife Warden, Government of Karnataka, Bangalore.
2. The Chairman, Zoo Authority of Karnataka, Bangalore
3. The Member Secretary, Zoo Authority of Karnataka, Mysore.

(B. S. Bonal)
Member Secretary

Bikaner House, Annexe VI, Shahjahan Road, New Delhi-110011
Phone : 011-23381585, 23073072, 23070375 (EPABX), Fax : +91-11-23386012
E-mail : cza@nic.in Website : <http://www.cza.nic.in>

Date: 23 May, 2012

Shri B. S. Bonal
Member Secretary
Central Zoo Authority
New Delhi

Subject: Inspection report regarding visit to Sri Chamarajendra Zoological Gardens, Mysore and Bannerghatta Biological Park, Bangalore for finalization of master plan – Reg.

Sir,

We visited the Sri Chamarajendra Zoological Gardens, Mysore and Bannerghatta Biological Park, Bangalore during the period 24th -25th April, 2012 respectively. The matter was discussed at length with the Director of the Zoos, Member Secretary & Chairman, Zoo Authority of Karnataka and Chief Wildlife Warden of Karnataka. On the basis of the consensus developed during these discussions concept paper for finalization of master plan for aforesaid zoos have been developed and are being put up for your perusal.

Member Secretary, Zoo Authority of Karnataka was keen acquiring more exotic animals for Mysore Zoo. The zoo already has 70 exotic species out of 170 species housed in the zoo. The zoo has very limited space and quite cramped, therefore the request can not be exceeded to. We have proposed removal of common exotic and indigenous birds which are not much of display value.

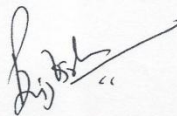
A draft of letter to CWLW, Karnataka has also been put up for your approval, if the CWLW, Karnataka supports the idea of moving one group of exotic animals i.e. Australian or Pan American to Bannerghatta that will release lot of pressure from Mysore Zoo.

In the interim period the concept plan could be sent to concerned zoos for finalization of the master plan and submitting the same to the CZA.

Yours faithfully,



S. C. Sharma



Brij Kishor Gupta

Encl. As above

MASTER PLAN FOR FUTURE DEVELOPMENT OF BANNERGHATTA BIOLOGICAL PARK, BANGALORE

BACKGROUND

Bannerghatta Biological Park had its origin as picnic spot in 1974 with an small area of 41 hectares with very small and dingy enclosures .In early Nineties a Tiger Safari was established to accommodate the Siberian Tigers rescued from the circuses in U.K. Subsequently larger Safaris were established for display of tiger and lions .Consequent to ban on performance of tigers ,lions and bears in circuses a Rescue Center for lions and tigers was established and a Bear Safari was also constructed .More or less at the same time a BUTTERFLY PARK was set up with the assistance of the Department Of Science and Technology, Government Of india. Of late well laid out Deer Safaris have also have come up As a result of the developments enumerated above the safaris ,rescue center and the butterfly park have become the major areas of the activity and the old zoo has continued. Existence of such cramped zoo at the entry point of national park is counterproductive .The unplanned collection of wild animals in the old zoo is hardly making any significant contribution to ex-situ conservation of WILDLIFE. Most of the endangered species are represented by single or unpaired animals Species which need special mention in this regard are Grey Jungle Fowl, Lion Tailed Macaque, Mouse Deer and Monitor Lizard .Important endangered species of other regions of the country namely Asiatic Lion, Chinkara , Great Indian Hornbill and White stork are also represented by unpaired and single animals. One single Slander Loris and the single Assamese macaque have died during 2011-2012. But for tiger and panthers there has been hardly any breeding of Scheduled animals. The number of births and death of animals at the zoo during last three years do not speak very well about the status of the management of the zoo-

PERIOD	NUMBER OF BIRTHS	NUMBER OF DEATHS
SCHEDULED ANIMALS		
2008-2009	2	24
2009-2010	6	15
2010-2011	18	29
2011-2012	15	33
	-----	-----
	41	101

OTHER THAN SCHEDULED ANIMALS

2008-2009	1	3
2009-2010	103	36
2010 -11	51	54
2011-2012	21	21
	-----	-----
	1 76	116
	-----	-----

*deaths of star tortoises, red eared terrapins and Japanese quails seized from the smugglers where more than 1000 animals died not included.

**Births include 139 births of cheetal and Sambhar

In view of the situation explained above the zoo authorities have decided to re do the old zoo for housing the reptiles and birds making appropriately designed naturalistic enclosures of suitable dimensions taking due care to leave green buffers around each enclosure .Mammalian Species are to be shifted to the new area identified for expansion of the zoo. Most of the species are to be in safaris. The species which can not be displayed in safaris shall be housed in nature emerging enclosures of optimum dimensions as per needs of the species to be housed. The zoo must optimize its conservation role through planned breeding of identified endangered species endemic to the region. Ample availability provides unique opportunity to the zoo to make significant contribution in this regard.

The zoo has been making significant contribution to the upkeep and health care of rescued animals. The facilities have to be expanded further to take care of Ungulates ,Primates ,Birds and Reptiles

Collection Plan

Taking in to consideration the needs of conservation of endangered species ,conservatio education and satisfaction of the curiosity of visitors as well as the past performance of the zoo in upkeep and health care of various species following collection plan is proposed for the zoo-

(A) SPECIES FOR PLANNED BREEDING-

GREY JUNGLE FOWL, RED JUNGLE FOWL, RED SPUR FOWL, GREY PARTRIDGE, GAUR, INDIAN WOLF, DHOLE, LION TAILED MACAQUE, NILGRI LANGUR, INDIAN GIANT SOUIRREL. MONITOR LIZARD, KING COBRA

An off the display area of 20 hectares to be earmarked for the purpose and effort to get 20 number of each species through panned breeding to be made getting as many founder animals as possible but not less than 2males and five females

(B) SPECIES TO BE DISPLAYED IN SAFARIES-

INDIAN LION, TIGER, PANTHER, SLOTH BEAR, GAUR, SAMBHAR - CHEETAL-KANKAR-WIILD BOAR, BLUE BULL-HOG DEER-BLACK BUCK, ELEPHANT

MAMMALIAN SPECIES TO BE DISPLAYED IN NATURE EMERSING ENCLOSURES-

FIRST PHASE - JUNGLE CAT, LEOPARD CAT, JACKAL, TODDY CAT, HYENA, SANGHAI, LOIN TAILED MACAQUE, RHESUS MACAQUE, COMMON LANGUUR, NILGIRI LANGUR

SECOND PHASE - WILD DOG, WOLF, COMMON FOX, SWAMP DEER

EXOTIC SPECIES- HIPPPPO,

BIRDS - PAINTED STORK, OPENBILLED STORK, PIN TAIL, RUDY SHELL DUCK, COMB DUCK, LESSR WHSILING TEAL, GREY LEG GOOSE, RED CRESTED POCHARD, LESSER ADJUTANTSTORK, GREY PELICAN, ROSE RINGED PARAKEET, ALEXANDARIN PARAKEET, SLATY HEADED PARAKEET, RED BRESTED PARAKEET, RED JUNGLE FOWOL, GREY JUNGLE FOWL, PEA COCK PEA COCK WHITE, KALEEZ PHEASNT

EXOTIC SPECIES- OSTRICH, EMU, LADY AMHERSTS PHEASANTS, GOLDEN PHEASANT, CHINESE RING NECKED PHEASANT, BLACK SWAN

REPTILES- GHARIYAL, MARSH CROCDILE, INDIAN ROCK PYTHON, INDIAN COBRA, KING COBRA, RUSSELS VIPER, RAT SNAKE, SAND BOA, CAIMAN, STAR TORTOISE. RIVER TERRAPIN, INDIAN FLAP SHELL TURTLE.

*NOTE:

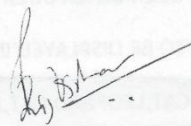
1. The Siberian tiger and hybrid Lions can be housed in one block of the rescue centre and other block of the rescue centre could be used for housing the circus animals.

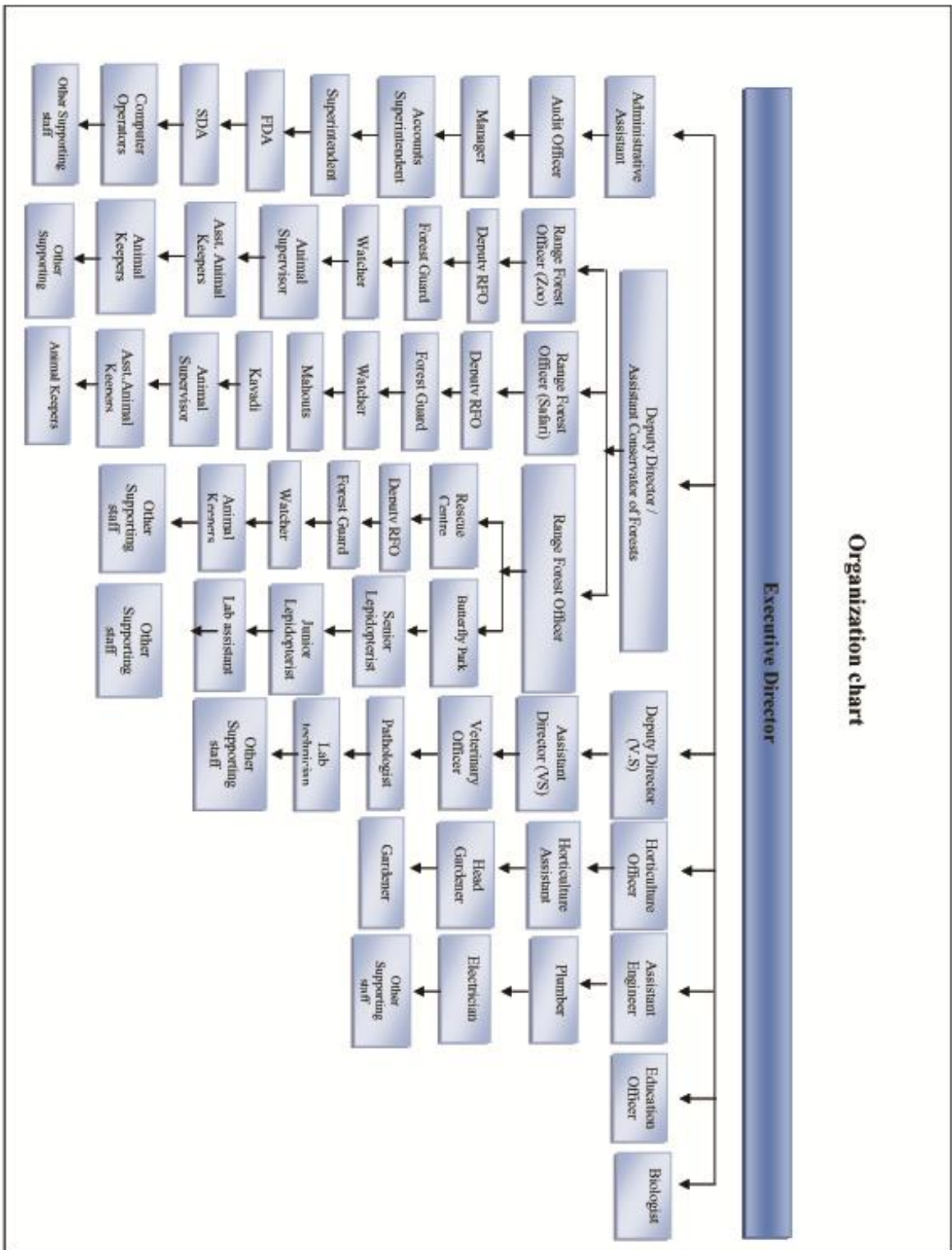
2. The common birds like Love birds and Cockatiel could be housed in Small aviaries in Jungle lodges and kept outside the inventory of the zoo. Smaller native birds like Munia, Koel and Weaver bird could also be removed from display and released into the wild.

OTHER SUGGESTIONS

1 Health care facilities appear to be too inadequate. A well planned and adequately equipped hospital need to be created In off the display area of the old zoo. The existing hospital should be converted in to visitor education and information centre







Organisation Chart

The distributed of posts in different units under Bannerghatta Biological Park

Sl. No .	Category Posts	ED Office	BBP ZOO	BBP Safari	BBP Rescue Centre	BBP Butterfly Park	BBP Hospital	Total
1	Executive Director,	1						1
2	Deputy Director	1						1
3	Asst. Director (AH & VS)						1	1
4	Senior Lepidopterist					1		1
5	Junior Lepidopterist					2		2
6	Veterinary Officer		1	1	1			3
7	Assistant Engineer	1						1
8	Administrative Assistant	1						1
9	Audit Officer	1						1
10	Accounts Superintendent	1						1
11	Range Forest Officer		1	1	1			3
12	Superintendent	2						2
13	Manager	1						1
14	Assistant Curator		1	1	1			3
15	Assistant Horticulture Officer	1						1
16	Assistant Manager	2						2
17	Biologist / Education Officer	2						2
18	Lab Technician					1		1
19	First Division Asst.	4						4
20	Senior Driver	2						2
21	Forester	1	1	1	1			4
22	Horticulture Asst.	1	1		1			3
23	Animal Supervisor		2	2	1			5

24	Second Division Asst.	5						5
25	Driver	5						5
26	Plumber		1	1	1			3
27	Electrician		1		1			2
28	Head Gardener	4						4
29	Animal Keeper		14	14	12			40
30	Veterinary Lab Assistant						2	2
31	Computer Operator	2	1	1	1		1	6
32	Forest Guard		4	3	3			10
33	Forest Watcher		4	3	3			10
34	Mahouts		10					10
35	Kavadi		10					10
36	Attender (peon)	3	1	1	1		1	7
37	Gardener	8						8
38	Assistant Animal Keeper		5	5	5	5	5	25
39	Sweepers		13			2		15
Total		49	71	34	33	11	10	208

GOVERNMENT OF KARNATAKA

Principal Chief Conservator
of Forests (Wildlife) and
Chief Wildlife Warden
Karnataka State



Off: 080-3345846
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Aranya Bhavan, II Floor,
18th Cross, Malleswaram,
Bangalore - 560 003

No: EST/WL/CR-17/2002-03

Date: 22-7-2003

To:
The Principal Secretary,
Forests, Environment and Ecology Department,
Government of Karnataka,
M S Building,
Bangalore- 560 001.

Sir,

Sub: Proposal for reorganizing of the Bannerghatta Biological Park,
Bannerghatta National Park and Cauvery Wildlife Division -reg.

- Ref: 1. This office D O letter even number dated 20-11-2002 addressed to
PCCF, copied to Pr. Secy, FEE.
2. The table showing the areas proposed to be covered by the
above three Divisions, furnished to Govt. by this office.

* * * * *

In this office letter in reference (1) above, a set of proposals were submitted
for reorganizing the Wildlife Wing of Karnataka, including territorial boundaries
of Divisions and reorganizing the unit officers. Further, a statement was submitted
proposing the extent of areas to be included under 3 Divisions, viz., Bannerghatta
Biological Park, Bannerghatta National Park and Cauvery Wildlife Division.

A meeting was held on 7-7-2003 in this office with the DCFs, ACFs and
RFOs of the above 3 Divisions, and the question of delimiting the boundaries of
the above Divisions was discussed in detail. Based on our discussion, I am
proposing the following jurisdiction to the above 3 Divisions.

I. The jurisdiction of the Executive Director, Bannerghatta Biological Park

The following table describes the proposed areas for inclusion and the
purpose for which they are meant.

Page- 1

Sl. No	Areas identified	Area in ac., gunt.	Area in Ha	Purpose for which required
A	Existing			
1.	Reserve Forest			
a)	Ragihalli Reserve Forest (Part)	164.33	66.70	Existing Bear Safari, "Born Free Foundation" facility, Tiger Safari, Lion Safari and proposed Leopard Safari.
b)	Kalkere Reserve Forest (Part)	292.15	118.32	Proposed nature interpretation area, nature walk, elephant joy ride, arboretum, etc.
c)	Bannerghatta Reserve Forest (Part) <i>B. Kaval Sp 1</i>	435.06	176.01	Existing herbivore safari, JLR Camp and adjoining natural forest, excluding Hakki Pikki Colony.
2.	Government wastelands handed over to the Karnataka Forest Department during 1978 in Sy. No. 16 and 21 of Byrappanahalli village and in Sy. No. 130 of Bannerghatta village.	253.19	102.58	Parking area, Rescue Centre, Mirza hill, Dinosaur Park etc., (for existing & future expansion)
3.	Private lands acquired (and some in the process of acquisition) in Bannerghatta and Byrappanahalli villages.	168.28	68.27	Existing Rescue Centre, CUPA & proposed Butterfly Park, KSTDC restaurant, Bus stand, etc.,
	Total (A)	1314.21	531.88	
B	Additional areas proposed (Reserve Forests)			
1.	That part of land existing in Ragihalli RF (Part) and Bannerghatta Lac Reserve (Part) surrounded by asphalted safari road leading from Park to Tiger safari and the existing metal road from Tiger safari to Bear safari and further proceeding towards Herbivore safari (including the road and 39 meters of view lines on outer boundary) as described in enclosed sketch.	469.12	190.00	Proposed nature trek, elephant safari, bird watching programmes and other future uses.
2.	The forest area falling in between Udagabande and Hajamanakallu Road including Udagabande watch tower (as described in enclosed sketch).	24.23	10.00	For landscape viewing and nature trek/walk.
	Total (B)	494.00	200.00	
	Grand total (A + B)	1808.21	731.88	

Note:

1. All the buildings, structures, vehicles and water impoundments in the above areas shall stand transferred to Bannerghatta Biological Park.
2. The areas given in the above table shall be excluded from the final notification of the Bannerghatta National Park.

Head quarters of the officers of Bannerghatta Biological Park.

It is proposed that the DCFs (Executive Director, Bio-park), office may be fixed at the Bio-park premises. The headquarters of the existing 1 ACF, 2 RFOs, 1 Forester and 3 Forest Guards may continue as it is (for this a GO No. FEE.271.FWL.2002, Bangalore dated 21-3-2003 has already been issued).

II. The jurisdiction of the Dy. Conservator of Forests, Bannerghatta National Park:

The following table describes the proposed areas.

Sl. No.	Description of the area	Extent covered
1	The entire Forest areas of the existing Bannerghatta National Park	11,005.89 ha.
2	(Less) area transferred to bio-park a. Reserve Forest = 561.03 b. Govt. waste land transferred = 102.58 c. Private land acquired = 68.27 Total = 731.88	731.88 ha.
3.	Net area (Sl no. 1 -2) after reorganization	10,274.01 ha.

The earlier proposal to include Kanakapura WL Range to BNP was found to be administratively inconvenient. All the officers who participated in the meeting were of the same view. Hence, the Kanakapura WL Range has been excluded.

Head quarters of the officers of Bannerghatta National Park.

The existing and proposed headquarters of the DCF, ACF and RFOs is given in the table below:

Sl. No.	Designation	Existing HQ	Proposed HQ
1.	DCF, BNP	Bannerghatta	Kalkere
2.	ACF, BNP	Bannerghatta	Kalkere
3.	RFO, WL, Bannerghatta	Bannerghatta	Kalkere
4.	RFO, WL, Anekal	Anekal	Anekal
5.	RFO, WL, Harohalli	Harohalli	Harohalli

A sketch delimiting the Bannerghatta Bio-park and the Bannerghatta National Park is enclosed for illustration.

III. The jurisdiction of the Dy. Conservator of Forests, Cauvery Wildlife Division :

The following table describes the proposed areas.

Sl. No.	Description of the area	Existing area	Proposed area
1	Total area of the Cauvery WL sanctuary	52,696 ha.	52,696 ha.

No change is proposed in the existing area of the Cauvery Wildlife Division. The earlier proposal to delete the Kanakapura WL Range and attach it to Bannerghatta National Park Division, may be treated as withdrawn.

Head quarters of the officers of Cauvery Wildlife Division.

The existing and proposed headquarters of the DCF, ACF and RFOs is given in the table below:

Sl. No.	Designation	Existing HQ	Now proposed HQ
1.	DCF	Kanakapura	Kanakapura
2.	ACF	Hanur	Hanur
3.	PFO, WL Kanakapura	Kanakapura	Kanakapura
4.	RFO, WL Hanur	Hanur	Hanur
5.	RFO, WL Cowdalli	Cowdalli	Cowdalli
6.	RFO, WL M M Hills	M M Hills	M M Hills

All previous proposals made in regard to the above 3 Divisions may be treated as withdrawn.

It is requested that a GO may be issued indicating the delimitation of the first 2 Divisions (Bannerghatta Bio-park and BNP) and the headquarters of the concerned officers.

As regards Cauvery WL Divisions, no changes are necessary, and the status-quo may be continued.

The earlier proposal by this office to shift Headquarter of DCF, Kollegal Division, to Chamarajanagar, may be treated as withdrawn.

Necessary orders may kindly be caused to be issued.

Yours faithfully,



Principal Chief Conservator of Forests
(Wildlife)

Encl:

A sketch illustrating the proposal.

ಕರ್ನಾಟಕ ಸರ್ಕಾರದ ನಡವಳಿಗಳು

ವಿಷಯ: ಬನ್ನೇರುಘಾಟ್ ರಾಷ್ಟ್ರೀಯ ಉದ್ಯಾನವನ ಹಾಗೂ
ಬನ್ನೇರುಘಾಟ್ ಬಯೋಲಾಜಿಕಲ್ ಪಾರ್ಕ್‌ನ ಪ್ರಸಾರ
ರಚನೆ ಬಗ್ಗೆ

- ಓದಲಾಗಿದೆ 1) ಸರ್ಕಾರದ ಆದೇಶ ಸಂಖ್ಯೆ: ಅಪಜೀ 271 ಅಪಸೇ 2002, ದಿನಾಂಕ: 21-03-2003
2) ಪ್ರಧಾನ ಮುಖ್ಯ ಅರಣ್ಯ ಸಂರಕ್ಷಣಾಧಿಕಾರಿ (ವನ್ನಜೀವಿ) ಇವರ ಪತ್ರ ಸಂಖ್ಯೆ:
ಇಎಸ್‌ಟ : ಡಬ್ಲ್ಯೂಎಲ್‌:ಸಿಆರ್-17:2002-03, ದಿನಾಂಕ: 22-07-2003

.....

ಪ್ರಸ್ತಾವನೆ:

ಮೇಲೆ (1) ರಲ್ಲಿ ಓದಲಾದ ದಿನಾಂಕ: 21-03-2003 ರ ಆದೇಶದಲ್ಲಿ ಬನ್ನೇರುಘಾಟ್ ಬಯೋಲಾಜಿಕಲ್ ಪಾರ್ಕ್‌ನಲ್ಲಿರುವ ಪ್ರಾಣಿಸಂಗ್ರಹಾಲಯ, ಹುಲಿಧಾಮ, ಸಿಂಹಧಾಮ, ಕರಡಿಧಾಮ, ಬರಕೆಧಾಮ, ಉದ್ದೇಶಿತ ಚಿಟ್ಟೆಗಳ ಉದ್ಯಾನವನ, ಪ್ರಾಣಿಗಳ ರಕ್ಷಣಾ ಘಟಕ ಇವುಗಳನ್ನು ಅಂತರಾಷ್ಟ್ರೀಯ ಮಟ್ಟದ ಹಂತಕ್ಕೆ ಅಭಿವೃದ್ಧಿಪಡಿಸಲು ಹಾಗೂ ಇವುಗಳ ಪರಿಣಾಮಕಾರಿ ಮೇಲುಸ್ತುವಾರಿಗಾಗಿ ನಿರ್ದೇಶಕರು, ಬನ್ನೇರುಘಾಟ್ ಬಯೋಲಾಜಿಕಲ್ ಪಾರ್ಕ್ ಹುದ್ದೆಯನ್ನು ಸೃಷ್ಟಿಸಲಾಗಿತ್ತು.

ಮೇಲೆ (2) ರಲ್ಲಿ ಓದಲಾದ ದಿನಾಂಕ: 22-07-2003 ರ ಪತ್ರದಲ್ಲಿ ಪ್ರಧಾನ ಮುಖ್ಯ ಅರಣ್ಯ ಸಂರಕ್ಷಣಾಧಿಕಾರಿ(ವನ್ನಜೀವಿ), ಬೆಂಗಳೂರು ಇವರು, ಆಡಳಿತಾತ್ಮಕ ಹಿತದೃಷ್ಟಿಯಿಂದ ಮತ್ತು ವನ್ನಜೀವಿ ವಲಯದ ಸಮರ್ಪಕ ನಿಯಂತ್ರಣ ಹಾಗೂ ಸುಲಲಿತವಾಗಿ ಕಾರ್ಯನಿರ್ವಹಿಸಲು ಅನುವಾಗುವಂತೆ ಬನ್ನೇರುಘಾಟ್ ರಾಷ್ಟ್ರೀಯ ಉದ್ಯಾನವನದ 11,005.89 ಹೆಕ್ಟೇರ್ ಪ್ರದೇಶದ ಪೈಕಿ 731.88 ಹೆಕ್ಟೇರ್ ಪ್ರದೇಶವನ್ನು ಬನ್ನೇರುಘಾಟ್ ಬಯೋಲಾಜಿಕಲ್ ಪಾರ್ಕ್‌ನ ಅಧೀನಕ್ಕೊಳಪಡಿಸಿ, ಬನ್ನೇರುಘಾಟ್ ಬಯೋಲಾಜಿಕಲ್ ಪಾರ್ಕ್‌ನ ವ್ಯಾಪ್ತಿಯನ್ನು ನಿಗದಿಪಡಿಸಲು ಹಾಗೂ ಬನ್ನೇರುಘಾಟ್ ರಾಷ್ಟ್ರೀಯ ಉದ್ಯಾನವನದ ಕೆಲವು ಅಧಿಕಾರಿಗಳ ಕೇಂದ್ರ ಸ್ಥಾನವನ್ನು ಸ್ಥಳಾಂತರಿಸುವ ಬಗ್ಗೆ ಸರ್ಕಾರಕ್ಕೆ ಪ್ರಸ್ತಾವನೆಯನ್ನು ಸಲ್ಲಿಸಿರುತ್ತಾರೆ.

ಸರ್ಕಾರವು ಪ್ರಧಾನ ಮುಖ್ಯ ಅರಣ್ಯ ಸಂರಕ್ಷಣಾಧಿಕಾರಿಗಳ (ವನ್ನಜೀವಿ) ಪ್ರಸ್ತಾವನೆಯನ್ನು ಕೂಲಂಕಷವಾಗಿ ಪರಿಶೀಲಿಸಿ ಬನ್ನೇರುಘಾಟ್ ಬಯೋಲಾಜಿಕಲ್ ಪಾರ್ಕ್‌ನ ವ್ಯಾಪ್ತಿಯನ್ನು ನಿಗದಿಪಡಿಸಿ ನಿರ್ದೇಶಕರ ಕಾರ್ಯವ್ಯಾಪ್ತಿಗೆ ತರಲು ಹಾಗೂ ಬನ್ನೇರುಘಾಟ್ ರಾಷ್ಟ್ರೀಯ ಉದ್ಯಾನವನದ ಕೆಲವು ಅಧಿಕಾರಿಗಳ ಕೇಂದ್ರ ಸ್ಥಾನವನ್ನು ಸ್ಥಳಾಂತರಿಸಲು ನಿರ್ಧರಿಸಿ ಈ ಕೆಳಕಂಡಂತೆ ಆದೇಶ ಹೊರಡಿಸಿದೆ.

ಸರ್ಕಾರದ ಆದೇಶ ಸಂಖ್ಯೆ: ಅಪಜೀ 271 ಅಪಸೇ 2002,
ಬೆಂಗಳೂರು, ದಿನಾಂಕ: 09-09-2003

ಸರ್ಕಾರವು ಪ್ರಸ್ತಾವನೆಯನ್ನು ಕೂಲಂಕಷವಾಗಿ ಪರಿಶೀಲಿಸಿ ತಕ್ಷಣದಿಂದ ಚಾರಿಗೆ ಬರುವಂತೆ ಹಾಗೂ ಮುಂದಿನ ಆದೇಶದವರೆಗೆ ಬನ್ನೇರುಘಾಟ್ ಬಯೋಲಾಜಿಕಲ್ ಪಾರ್ಕ್‌ನ ವ್ಯಾಪ್ತಿಯನ್ನು ಈ ಕೆಳಕಂಡಂತೆ ನಿಗದಿಪಡಿಸಿದೆ.

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ಕ್ರಮ ಸಂಖ್ಯೆ	ಪ್ರದೇಶ	ಹೆಕ್ಟೇರುಗಳಲ್ಲಿ
01	ರಾಗೀಹಳ್ಳಿ ಮೀನಲು ಅರಣ್ಯ (ಭಾಗ)	66.70
02	ಕಲ್ಲೇ ಮೀನಲು ಅರಣ್ಯ (ಭಾಗ)	118.32
03	ಬನ್ನೇರುಘಟ್ಟ ಮೀನಲು ಅರಣ್ಯ (ಭಾಗ)	176.01
04	ಅರಣ್ಯ ಇಲಾಖೆಗೆ ಸರ್ಕಾರವು 1978 ರಲ್ಲಿ ಹಸ್ತಾಂತರಿಸಲಾದ ಬೈರಪ್ಪನ ಹಳ್ಳಿ ಗ್ರಾಮದ ಸರ್ವೆ ನಂ:18 ಮತ್ತು 21 ರ ಪ್ರದೇಶ ಹಾಗೂ ಬನ್ನೇರುಘಟ್ಟ ಗ್ರಾಮದ ಸರ್ವೆ ನಂ: 130 ರಲ್ಲಿರುವ ಪ್ರದೇಶ	102.58
05	ಬನ್ನೇರುಘಟ್ಟ ಹಾಗೂ ಬೈರಪ್ಪನ ಹಳ್ಳಿ ಗ್ರಾಮದಲ್ಲಿ ವಶಪಡಿಸಿಕೊಂಡಿರುವ ಖಾಸಗಿ ಜಮೀನು	68.27
06	ರಾಗೀಹಳ್ಳಿ ವಲಯದಲ್ಲಿ ಲಭ್ಯವಿರುವ ಭಾಗಶಃ ಪ್ರದೇಶ, ಉದ್ಯಾನವನದಿಂದ ಟ್ರೈಗರ್ ಸೆಫಾರಿಗೆ ಇರುವ ಡಾಂಬರೀಕೃಷ್ಣ ಸೆಫಾರಿ ರಸ್ತೆಯೊಂದಿಗೆ ಸುತ್ತುವರಿದಿರುವ ಬನ್ನೇರುಘಟ್ಟ ಕೊಳವೆ ಮೀನಲು ಪ್ರದೇಶ (ಭಾಗ), ಹುಲಿ ಸೆಫಾರಿಯಿಂದ ಕರಡಿ ಸೆಫಾರಿಯವರೆಗೆ ಇರುವ ರಸ್ತೆ ಹಾಗೂ ಶಾಖಾಪಾರಿ ಪ್ಯಾಕೇಜ್ ಸೆಫಾರಿ ಪ್ರದೇಶ.	190.00
07	ಉದಗುಂಡೆ ವೀಕ್ಷಣಾ ಗೋಪುರವು ಸೇರಿದಂತೆ ಉದಗುಂಡೆ ಮತ್ತು ಹೆಚ್ಚಾಕುವ ಕಲ್ಲು ರಸ್ತೆ ನಡುವೆ ಬರುವ ಅರಣ್ಯ ಪ್ರದೇಶ.	10.00
	ಒಟ್ಟು ಪ್ರದೇಶ	731.88

ಮೇಲ್ಕಂಡ ಪ್ರದೇಶ ಹಾಗೂ ಅದರಲ್ಲಿರುವ ಎಲ್ಲಾ ಕಟ್ಟಡಗಳು, ವಾಹನಗಳು ಹಾಗೂ ಇನ್ನಿತರ ಅಪತ್ತು ಪದ್ಧತಿಗಳನ್ನು ಬನ್ನೇರುಘಟ್ಟ ರಾಷ್ಟ್ರೀಯ ಉದ್ಯಾನವನದ ವ್ಯಾಪ್ತಿಯಿಂದ ಬೇರ್ಪಡಿಸಿ ಬನ್ನೇರುಘಟ್ಟ ಬಯೋಲಾಜಿಕಲ್ ಪಾರ್ಕಿನ ವ್ಯಾಪ್ತಿಗೆ ತರಲಾಗಿದೆ.

ಬನ್ನೇರುಘಟ್ಟ ಬಯೋಲಾಜಿಕಲ್ ಪಾರ್ಕಿಗೆ ಪರ್ಗಾಯಿಸಲಾದ 731.88 ಹೆಕ್ಟೇರ್ ಪ್ರದೇಶವನ್ನು ಹೊರತುಪಡಿಸಿ ಉಳಿದ 10,274.01 ಹೆಕ್ಟೇರುಗಳನ್ನು ಪ್ರದೇಶವನ್ನು ಬನ್ನೇರುಘಟ್ಟ ರಾಷ್ಟ್ರೀಯ ಉದ್ಯಾನವನದ ವ್ಯಾಪ್ತಿಯಲ್ಲಿಯೇ ಮುಂದುವರಿಸಲಾಗಿದೆ.

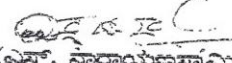
ಬನ್ನೇರುಘಟ್ಟ ಬಯೋಲಾಜಿಕಲ್ ಪಾರ್ಕಿನ ನಿರ್ದೇಶಕರು ಹಾಗೂ ಇನ್ನಿತರ ಹುದ್ದೆಗಳ ಕೇಂದ್ರ ಸ್ಥಾನವನ್ನು ಸರ್ಕಾರಿ ಆದೇಶ ಸಂಖ್ಯೆ ಆಪಜೇ 271 ಆಪಸೇ 2002, ದಿನಾಂಕ: 21-03-2003 ರಲ್ಲಿ ನಿಗದಿಪಡಿಸಿರುವಂತೆ ಮುಂದುವರಿಯತಕ್ಕದ್ದು.

.....3....

ಬನ್ನೇರುಘಟ್ಟ ರಾಷ್ಟ್ರೀಯ ಉದ್ಯಾನವನದ ವಿವಿಧ ಅಧಿಕಾರಿಗಳ ಕೇಂದ್ರ ಸ್ಥಾನವನ್ನು ಈ ಸಂದರ್ಭಕ್ಕೆ ಸ್ಥಳಾಂತರಿಸಲಾಗಿದೆ.

ಕ್ರಮ ಸಂಖ್ಯೆ	ಹುದ್ದೆಯ ಹೆಸರು	ಅಸ್ತಿತ್ವದಲ್ಲಿರುವ ಸ್ಥಳ	ಸ್ಥಳಾಂತರಗೊಂಡ ಸ್ಥಳ
01	ಉಪ ಅರಣ್ಯ ಸಂರಕ್ಷಣಾಧಿಕಾರಿ, ಬನ್ನೇರುಘಟ್ಟ ರಾಷ್ಟ್ರೀಯ ಉದ್ಯಾನವನ	ಬನ್ನೇರುಘಟ್ಟ	ಕಲೈರೆ
02	ಸಹಾಯಕ ಅರಣ್ಯ ಸಂರಕ್ಷಣಾಧಿಕಾರಿ, ಬನ್ನೇರುಘಟ್ಟ ರಾಷ್ಟ್ರೀಯ ಉದ್ಯಾನವನ	ಬನ್ನೇರುಘಟ್ಟ	ಕಲೈರೆ
03	ವಲಯ ಅರಣ್ಯಾಧಿಕಾರಿ(ವನ್ಯಜೀವಿ), ಬನ್ನೇರುಘಟ್ಟ ರಾಷ್ಟ್ರೀಯ ಉದ್ಯಾನವನ	ಬನ್ನೇರುಘಟ್ಟ	ಕಲೈರೆ

ಕರ್ನಾಟಕ ರಾಜ್ಯಪಾಲರ ಆದೇಶಾನುಸಾರ ಮತ್ತು ಅವರ ಹೆಸರಿನಲ್ಲಿ


(ಎಸ್. ನಾರಾಯಣಸ್ವಾಮಿ),

ಸರ್ಕಾರದ ಅಧೀನ ಕಾರ್ಯದರ್ಶಿ-4,
ಅರಣ್ಯ ಪರಿಸರ ಮತ್ತು ಜೀವಿಶಾಸ್ತ್ರ ಇಲಾಖೆ.

ಇವರಿಗೆ

- 1) ಮಹಾಲೇಖಪಾಲರು, ಕರ್ನಾಟಕ, ಬೆಂಗಳೂರು
- 2) ಪ್ರಧಾನ ಮುಖ್ಯ ಅರಣ್ಯ ಸಂರಕ್ಷಣಾಧಿಕಾರಿ, ಅರಣ್ಯ ಭವನ, ಬೆಂಗಳೂರು
- 3) ಪ್ರಧಾನ ಮುಖ್ಯ ಅರಣ್ಯ ಸಂರಕ್ಷಣಾಧಿಕಾರಿ (ವನ್ಯಜೀವಿ), ಅರಣ್ಯ ಭವನ, ಬೆಂಗಳೂರು.
- 4) ಅಧ್ಯಕ್ಷರು, ಕರ್ನಾಟಕ ಮೃಗಾಲಯ ಪ್ರಾಧಿಕಾರ, ಶ್ರೀ ಚಾಮರಾಜೇಂದ್ರ ಪ್ರಾಣಿ ಸಂಗ್ರಹಾಲಯ, ಮೈಸೂರು
- 5) ಕಾರ್ಯಕಾರಿ ನಿರ್ದೇಶಕರು, ಕರ್ನಾಟಕ ಮೃಗಾಲಯ ಪ್ರಾಧಿಕಾರ, ಶ್ರೀ ಚಾಮರಾಜೇಂದ್ರ ಪ್ರಾಣಿ ಸಂಗ್ರಹಾಲಯ, ಮೈಸೂರು
- 6) ಅರಣ್ಯ ಸಂರಕ್ಷಣಾಧಿಕಾರಿ, ಬೆಂಗಳೂರು ಪತ್ರ, ಬೆಂಗಳೂರು.
- 7) ಉಪ ಅರಣ್ಯ ಸಂರಕ್ಷಣಾಧಿಕಾರಿ, ಬನ್ನೇರುಘಟ್ಟ ರಾಷ್ಟ್ರೀಯ ಉದ್ಯಾನವನ
- 8) ಉಪ ಅರಣ್ಯ ಸಂರಕ್ಷಣಾಧಿಕಾರಿ, ಬನ್ನೇರುಘಟ್ಟ ಬಯೋಲಾಜಿಕಲ್ ಪಾರ್ಕ್, ಬೆಂಗಳೂರು
- 9) ಅಧೀನ ಕಾರ್ಯದರ್ಶಿ, ಅರಣ್ಯ- ಎ ಮತ್ತು ಬಿ, ಅ ಪ ಜೀ ಇಲಾಖೆ
- 10) ಶಾಖಾ ರಕ್ಷಾ ಕಡತ : ಮಾಸಿಕ ರಾಜ್ಯ ಪತ್ರ : ಹೆಚ್ಚುವರಿ ಪ್ರತಿಗಳು

11/1/23
→

Government order – Extent of BBP

8	ಶ್ರೀಮತಿ ಉಷಾ ಕೋಂ ನಾಗರಾಜರಟ್ಟ ಪ್ರತಿನಿಧಿ, ಸ್ವೀಕೃತ ಸಂಸ್ಥೆ, ದೊಮ್ಮನಂದ್ರ, ಆನೇಕಲ್ ತಾಲ್ಲೂಕು	ಸದಸ್ಯರು
9	ಶ್ರೀಮತಿ ಮಧುಭೂಷಣ್, ಆರ್.ಜಿ.ಸರ್, ದೀಪಾ ಸಂಸ್ಥೆ, ಸಂ. 33/1-9, ತ್ಯಾಗರಾಜ ಲೇಔಟ್, ಮಾರುತಿ ಸೇವಾನಗರ ಅಂಚೆ, ಜಯಚಾರತಿ ನಗರ, ಬೆಂಗಳೂರು	ಸದಸ್ಯರು
10	ವ್ಯವಸ್ಥಾಪಕರು, ಸ್ಟೇಟ್ ಬ್ಯಾಂಕ್ ಆಫ್ ಮೈಸೂರು, ಆನೇಕಲ್	ಸದಸ್ಯರು
11	ಡವ್ವಟಿ ಕಮೀಷನರ್ ಆಫ್ ಪೊಲೀಸ್, ಬೆಂಗಳೂರು ದಕ್ಷಿಣ ವಿಭಾಗ, 4ನೇ ಬ್ಲಾಕ್, ಜಯನಗರ, ಬೆಂಗಳೂರು	ಸದಸ್ಯರು
12	ಉಪ ಕಾರ್ಮಿಕ ಅಧಿಕಾರಿ ರೀಜನ್-2, ಕಾರ್ಮಿಕ ಭವನ, ಬನ್ನೇರುಘಟ್ಟ ರಸ್ತೆ, ಬೆಂಗಳೂರು	ಸದಸ್ಯರು
13	ಸಹಾಯಕ ನಿರ್ದೇಶಕರು, ರೇಷ್ಮೆ ಕೃಷಿ ಇಲಾಖೆ, ಆನೇಕಲ್	ಸದಸ್ಯರು
14	ಸಹಾಯಕ ಭೂವಿಜ್ಞಾನಿ, ಗಣಿ ಹಾಗೂ ಭೂಗರ್ಭ ಇಲಾಖೆ, ಬೆಂಗಳೂರು ದಕ್ಷಿಣ ಕಛೇರಿ, 13ನೇ ಮೈಸೂರು ರಸ್ತೆ, ಬೆಂಗಳೂರು	ಸದಸ್ಯರು



ಕರ್ನಾಟಕ ರಾಜ್ಯಪತ್ರ ಮತ್ತು ಅರ್ಜಿ ಸಂಪನ್ಮೂಲ ಇಲಾಖೆ
 ಸಹಾಯಕ ನಿರ್ದೇಶಕರು
 ಸ್ವ ಉದ್ಯೋಗ ಕಾರ್ಯಕ್ರಮಗಳು ಹಾಗೂ ವಿದೇಶಿ ವ್ಯಾಪಾರ ಇಲಾಖೆ
 ಗ್ರಾಮೀಣಾಭಿವೃದ್ಧಿ ಮತ್ತು ಪಂಚಾಯತ್ ರಾಜ್ ಇಲಾಖೆ

FOREST, ENVIRONMENT AND ECOLOGY SECRETARIAT NOTIFICATION

No: FEE 19 FWL 98, Bangalore, Dated: 5th March 2004

Whereas by reason of its ecological faunal, floral, geomorphological or zoological association, or importance for the purpose of protecting, propagating or developing wildlife therein or its environment, the Government considered it necessary to constitute the area, the situation and limits of which are specified in the Schedule to the Notification No: AFD 61 FWL 74, dated: 6-25/9-1974 published in the Karnataka Gazettee dated: 9-1-75 as National Park called the "Bannerghatta National Park" in exercise of the powers conferred by sub-section (1) of section 35 of the Wildlife Protection Act, 1972 (Central Act 53 of 1972).

Whereas, while reconciling the survey number wise extent of the areas of Reserve Forests of Bannerghatta National Park, as per the directions of the Hon'ble Supreme Court in W.P. No: 202/1995, an extent of 1564.08 acres was added to the National Park area and thereby the total area raised to 27037.16 acres/10941.88 ha. Further during 1978 Government Waste lands in Sy.No. 16 and 21 of Byrappanahalli village and Sy.No. 130 of Bannerghatta village to an extent of 253.19 acres/102.38 ha were handed over by Revenue Department to Forest Department.

Whereas, certain private lands over an extent of 168.28 acres/68.27 ha in Bannerghatta and Byrappanahalli villages were acquired by following the land acquisition procedure vide Notification No: LAQ(2) SE9 1977-78 dated: 25-6-1977 of te Deputy Commissioner, Bangalore.

Whereas, thus altogether 11112.73 ha is the total extent out of which 246 acres/ 106.84 ha in to be deleted as per the decision taken on 16-4-2003 as the same has been granted to the beneficiaries at various stages starting from 1942 to 1976.

Whereas, the Balance area is 11005.89 ha out of which 731.88 ha has been earmarked for Bannerghatta Biological Park as per G.O.FEE 271 APASE 2002 dated: 09-09-2003. The remaining area of 10274.01 ha shall be the net National Park area.

Now therefore, in exercise of the powers conferred by sub-section (1) of section 35 of the Wildlife Protection Act, 1972 (Central Act 53 of 1972), the Government of Karnataka hereby declares the area, the situation and limits of which are specified in the schedule below as a National Park called "Bannerghatta National Park".

SCHEDULE

Name of the District - Bangalore Urban and Bangalore Rural.

Sl. No	Area (Name of the Reserve Forests)	Land Measurement	
		(in acres)	(in ha)
1.	Kalkere Reserve Forest	1067.20	432.00
2.	Bannerghatta Reserve Forest	0.09	0.09
3.	Bannerghatta Lake Reserve	42.38	17.38
4.	Ragihalli north Extension Block Reserve Forest	1236.20	500.41
5.	Ragihalli Reserve Forest	7050.22	2853.31
6.	Siddahalla Lake Reserve	359.30	145.59
7.	Ragihalli Extension Block South Reserve Forest	632.32	256.09

Sl. No.	Area (Name of the Reserve Forests)	Land Measurement	
		(in acres)	(in ha)
3.	Gullahatti Reserve Forest	3709-36	1501.38
೪.	Narukki Reserve Forest	1039-12	784.83
10.	Mahadeshwara Reserve Forest	5892-14	2384.60
11.	Bantanal Extension Reserve Forest	1120-00	453.26
12.	Bantanal Reserve Forest	2335-11	945.07
	Total	25387-05	10274.01

BOUNDARY DESCRIPTION

North:

The boundary of the Bannerghatta National Park starts from the Southwest corner of Sy.No. 108 of Gottigere and runs towards Northeast along its boundary to the common junction bandh of Sy.No. 107 and 108 of Gottigere and Sy.No. 8 and 7 of Basavanapura village and continue to run through the northern boundary of Kalkere R.F. upto the Southeast corner of Sy.No. 4 of Basavanapura village.

East:

And then, the boundary line runs along the eastern boundary of the Kalkere Reserve Forest till it touches the northern boundary of Bannerghatta Reserve Forest at south west corner of Sy.No. 196 of Bannerghatta and turns to east and runs along the northern boundary of the Bannerghatta Reserve Forest upto the north west corner of Sy.No. 21 of Byrappanahalli village and runs along the northern boundary of Sy.No. 21, and north eastern boundary of Sy.No. 20 and northern boundary of Sy.No. 6, 10, 11 of Byrappanahalli and northern boundary of Sy.No. 236, 237, 130 and 129 of Bannerghatta village and till it touches north west corner of Suddahalla Lake Reserve. Then runs along the northern and eastern boundary of the Suddahalla Lake Reserve and joins the northeast corner of Ragihalli Reserve Forest and runs along the eastern boundary of Ragihalli Reserve Forest and along the eastern and south western boundary of Ragihalli Extension Block south Reserve Forest and joins the southern boundary of Ragihalli Reserve Forest near Ragihalli and runs along the boundary of the said Reserve Forest till it reaches the Gullahatti Kaval Reserve Forest then runs towards south along its eastern boundary and meets the northern boundary of Karadikal Reserve Forest and runs along the said boundary towards east till it reaches Mahadeswara Reserve Forest and runs along its northern boundary and turn towards south along its eastern boundary and joins the interstate boundary (Karnataka and Tamilnadu) and runs along the interstate boundary to west enclosing Mahadeswara Reserve Forest., and towards south by enclosing Bantanal Extension Reserve Forest and Bantanal Reserve Forest upto Southeast corner of the Bantanal Reserve Forest

South:

And then, the boundary runs along the southern boundary of Bantanal Reserve Forest upto South-west corner of the Bantanal Reserve Forest

West:

Then the boundary line runs along the western, northern and western boundary of Bantanal Reserve Forest and then the Southern and western boundary of Bantanal Extension Reserve Forest and South-western boundary of Mahadeswara Reserve Forest and runs towards west along the southern boundary of Karadikal Reserve Forest and Gullahatti Reserve Forest Then runs towards north along the western boundary of Gullahatti Kaval Reserve Forest and along the western boundary of Ragihalli Reserve Forest excluding the released area (Hikkipikki colony) and western boundary of Bannerghatta Reserve Forest and Kalkere Reserve Forest and joins the starting point i.e., the Southwest corner of Sy.No. 108 of Gottigere (i.e., Northwest corner of Kalkere Reserve Forest.)

Enclosures:

1. BANNERGHATTA BIOLOGICAL PARK

Bannerghatta Biological Park is a Tourism Zone covering Zoo, Safaris and the Rescue Centre of the Central Zoo Authority built for the rehabilitation of rescued animals from circuses and street plays. It is brought under the jurisdiction of "Zoo Authority of Karnataka" for the special purpose of conservation and breeding of endangered wild animals, research on wildlife and creation of public awareness etc., This enclosure have the special status as "Bannerghatta Biological Park. Comprising of 66.70 + 140.00 + 10.00 = 216.70 ha. of Ragihalli Reserve Forest., 118.32 ha of Kalkere Reserve Forest., 176.01 ha of Bannerghatta R.F., 50.00 ha of Bannerghatta Lake Reserve, 102.58 ha of Government waste land and 68.27 ha of Acquired Land. Total extent of 731.88 ha is exclusively reserved for Bannerghatta Biological Park as per G.O. No: FEE 271 APASE 2002. dated 09-09-2003.

NB - The boundary descriptions be defined and notified to due course.

2. Chhodahalli village in Mahadeswara Reserve Forest in Anekal Taluk.

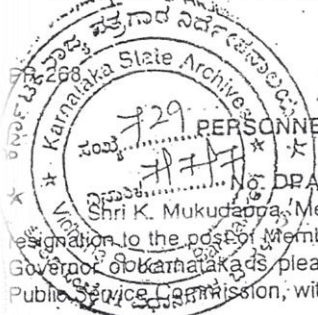
3. Kanime and Shivapura hamlets in Mahadeswara Reserve Forest in Kanakapura Taluk.
4. Gullahalli Kaval Village and Muninagara in Gullahalli Reserve Forest of Kanakapura Taluk.
5. Ukkada Hamlet inside the Bantanal Reserve Forest of Kanakapura Taluk.
6. 254 A.C. of granted land and 10 A.c of settlements in 4 bits in Sy No. 17 of Ragihalli - Ragihalli South Extension Reserve Forest

Right of Way:

1. Bannerghatta - Kagglipura Road via Kasaraguppe through the national park.
2. Ragihalli Road from Bannerghatta - Anekal Main Road passing through the National Park.
3. Indaluvadi - Maralawadi road via Uruganadoddi passing through the National Park.
4. Bangalore - Bannerghatta Road near Kalkere through the National Park.
5. Road to "Choodahalli from Thammanayakanahalli in Mahadeswara Reserve Forest of the National Park.
6. Link road from Indluvadi - Maralawadi road to Kanime Shivapura in Mahadeswara Reserve Forest.
7. Therubeedi - Maralawadi road in Bantanal Reserve Forest.
8. Yalachawadi - Vasupatna Road in Bantanal Reserve Forest.

By order and in the name the Governor of Karnataka
K.V. JAYALAKSHMI

Under Secretary to Government,
Forest, Environment and Ecology Department.



PERSONNEL AND ADMINISTRATIVE REFORMS SECRETARIAT
NOTIFICATION

No. DPAR 5 SSC 2004, Bangalore, dated 10th March 2004

Shri K. Mukudappa, Member, Karnataka Public Service Commission, Bangalore has rendered his resignation to the post of Member, Karnataka Public Service Commission vide letter dated 1.3.2004. The Governor of Karnataka is pleased to accept the resignation of Sri K. Mukudappa, Member, Karnataka Public Service Commission, with effect from 3.3.2004.

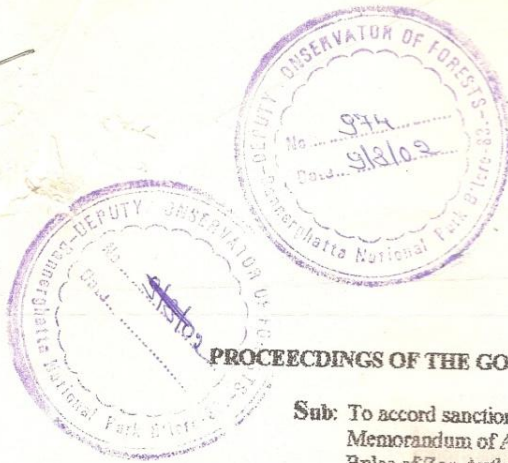
By Order and in the name of the Governor of Karnataka
H.R. Nagendra

Under Secretary to Government

Department of Personnel & Administrative Reforms (Service Rules)

PR-264

Gazette notification



1

PROCEEDINGS OF THE GOVERNMENT OF KARNATAKA

Sub: To accord sanction for amending the Memorandum of Association and Rules of Zoo Authority of Karnataka.

*_*_*_*_*_*_*_*_*_*

READ:

1. G. O. No. FFD 354 FWL 78 (1) DATED 08-01-1979.
2. G. O. No. FFD 43 FWL 79 DATED 19-07-1979.
3. G. O. No. AHFF 30 FWL 90 DATED 19-02-1992.
4. G. O. No. FEE 252 FWL 2000 DATED 15-05-2001.
5. NOTIFICATION No. DPAR 101 SFP 2000 DATED 30-08-2001.
6. G.O. NO. FEE 176 FNG 2001 DATED 20-12-2001.
7. LETTER OF PCCF (WL) NO.ZAK-CMN-CR-30/98-99 DATED 30-11-2001.

PREAMBLE:

In the Government Order read at (1) above, the Government has accorded sanction to set up a registered society designated as the "Zoo Authority of Karnataka". In the G.O. read at (2) above, the Government has framed Memorandum of Association and Rules for the said Society. In the G.O. read at (3) above the jurisdiction of the Zoo Authority of Karnataka was restricted only to the Mysore Zoo. Vide this G.O., the Government in exercise of the powers under Rules 16(1) further amended the Memorandum of Association and Rules which were framed in G. O. No. FFD 45 FWL 79 dated 19-07-1979. In the G.O. at (4) above, the jurisdiction of the Zoo Authority of Karnataka was extended to all the recognized zoos in Karnataka. In this order it was stated that after detailed review the unrecognized zoos in the state would be closed. A post designated as "Member Secretary" of Zoo Authority of Karnataka was created vide G.O. read at (6) above. In the Notification read at (5) above an officer in the rank of Chief Conservator of Forests has been posted in the newly created post. The Principal Chief Conservator of Forests (Wildlife) has submitted the proposals for bringing in amendments to the Memorandum of Association and rules vide letter read at (7) above.

ZAK
file
B
9/8/02

In a meeting convened by the Principal Secretary, Forest, Environment and Ecology Department on 17-01-2002, the above issues were discussed and it was decided that the following zoos may be brought under the control of the Zoo Authority of Karnataka.

1. Sri. Chamarajendra Zoological Garden, Mysore
2. Zoo portion of the Bannerghatta National Park, which may henceforth be called Bannerghatta Biological Park.
3. Children's Park and Mini Zoo, Bellary.
4. Children's Park and Mini Zoo, Gulbarga.
5. Indira Priyadarshini Prani Sangrahalaya, Davangere.
6. Mini Zoo at Kittur Rani Chennamma Nisargadhama, Bhutharamanahatti, Belgaum.

7. Children's Park -cum-Mini Zoo, Binkadakatti, Gadag.
8. Tiger and Lion Safari, Tyavarekoppa, Shimoga.

In the above meeting, it was decided to modify the Governing Council. Consequent upon the appointment of the full time Member Secretary to the Zoo Authority of Karnataka, it was also decided to bring in amendments to Rule 2 (f), rule 8, rule 9, rule 10(a), rule 11, rule 14, rule 15, rule 16-2 (b) rule 16-2 (d) and rule 21 and to include a new para-2 (h). In order to have local participation in the management of the zoos, constitution of a Zoo Advisory Committee for all the recognized zoos in Karnataka was envisaged in the said meeting. Finally it was decided in the meeting to provide staff for all the recognized zoos based on the guidelines of Central Zoo Authority.

The proposals were again discussed in a meeting on 24-06-2002 under the chairmanship of Hon'ble Minister for Forest, Environment and Ecology. It was decided that the Memorandum of Association and the Rules of the Zoo Authority of Karnataka need to be given a fresh look and extensive changes may be required. However, this may take some more time. However, as eight Zoos, including Sri Chamarajendra Zoological Gardens, Mysore, have to be taken over by the Zoo Authority of Karnataka and as a full time Member Secretary, Zoo Authority of Karnataka has already been appointed, it was felt that the Government Order incorporating necessary amendments to the Rules of the Zoo Authority of Karnataka, decision regarding responsibility and powers of the Member Secretary of Zoo Authority of Karnataka and other relevant instructions should be issued immediately for smooth functioning of the Zoo Authority of Karnataka in its new dispensation. It was decided that proposals for the Advisory Committees for the Zoos might be deferred for the time being pending detailed examination of the Memorandum of Association and Rules of the Zoo Authority of Karnataka. It was also decided to revise the proposed constitution of the Governing Council and make a few alterations to the amendments proposed in the meeting of 17-01-2002.

After thorough discussions the Government has decided to bring the amendments to the above said Memorandum of Association and Rules of the Zoo Authority of Karnataka vide a Government Order.

GOVERNMENT ORDER NO. FEE 252 FWL 2000 BANGALORE DATED : 20-07-2002

Consequent upon the extension of the jurisdiction of the Zoo Authority of Karnataka to all the recognized zoos, the following zoos are brought under Zoo Authority of Karnataka with immediate effect:

installments i.e., 1st May and 1st September. This is considered important in view of the fact that the expenditure on feed and up-keep of animals and salary of the staff cannot be delayed.

7. The Central Account of the ZAK shall be maintained by the Member Secretary, ZAK, in any scheduled/Nationalized Bank. In addition, each zoo shall be authorized to maintain one bank account. All the gate collections and other revenue and donations collected shall be credited to the account maintained by the zoo and shall be used in a manner described under the rules of the Zoo Authority of Karnataka.

BY ORDER AND IN THE NAME OF THE
GOVERNOR OF KARNATAKA

K.V. Jayalakshmi
(K.V. JAYALAKSHMI) 20/7/2002

Under Secretary to Government,
Forest, Environment & Ecology Dept.,

To

The Compiler, Gazette, Karnataka.
It is requested to publish G.O. in the next issue
of the Gazette and to supply 100 copies of the same
to the Forest Department.

Copy to:

1. Accountant General (Audit I and II) counts and Entitlement, Karnataka, Bangalore.
2. The Principal Chief Conservator of Forests, Bangalore.
3. Principal Chief Conservator of Forests (Wildlife) Bangalore.
4. The Secretary, Central Zoo Authority, Bikaner House, Shahajahan Road,
New Delhi 110 011.
5. The Secretary, Ministry of environment and Forests, Paryavaran Bhavan,
CGO Complex, Lodi Road, New Delhi 110 001.
6. The Member Secretary, Zoo Authority of Karnataka, Mysore.
7. The Conservators of Forests of Territorial Circles.
8. The Conservator of Forests and Director, Bannerghatta National Park, Bangalore.
9. The Deputy Secretary, Finance Department, Vidhana Soudha, Bangalore.
10. The Deputy Secretary, Law Department, Bangalore.
11. The Assistant Director, Planning Department, Bangalore
12. The Deputy Conservators of Forests of Territorial Divisions of Bellary, Gulbaraga,
Davanagere, Belgaum and Gadag and wildlife Division, Shimoga.
13. The Executive Director, Sri Chamarajendra Zoological Gardens, Mysore.
- ✓ 14. The Deputy Conservator of Forests, Bannerghatta Biological Park, Bannerghatta.

PROCEEDINGS OF THE GOVERNMENT OF KARNATAKA

Subject:

*The Zoo Authority of Karnataka framing of the Memorandum of Association and
Rules of the Society Approval of*

Order No. FFD 45 FWL 79, Bangalore: dated the 19th July 1979

Read: (1) Government Order No. FFD. 354. FWL.78 (I) dated: 8-1-1979
(2) Letter No. WLP.MZO.CR.7/78-79 dated: 1-2-1979 from the Chief
Conservator of Forests (Development), Bangalore.

PREAMBLE:

In the Government Order cited (1) above, Government have constituted a Society designated as, "the Zoo Authority of Karnataka" to be registered under the Registration of Societies Act, to look after the zoo at Mysore and also such other Zoological Gardens or Zoos as may be established any where in the State from time to time. The Chief Conservator of Forests (Development) has now submitted for approval of Government Draft Memorandum of Association and Byelaws of the Society.

ORDER

Government are pleased to approve the Memorandum of Association and the Rules of the Zoo Authority of Karnataka as indicated in the annexure to this order

The Chief Conservator of Forests (Development) is requested to take further necessary action to register the Society under the Registration of Societies Act etc.

By order in the name of the
Governor of Karnataka,

Sd/-

(H. Muniram)

Under Secretary to Government,
Food and Forest Department.

To

The compiler, Karnataka Gazette, Bangalore for kind publication in the Gazette.

He is requested to send 100 printed copies to the CCF (D), Bangalore.

Copies to:

1. The Chief Conservator of Forests (Development), Bangalore
2. The Accountant General, Karnataka, Bangalore.
3. The Director of Horticulture, Bangalore
4. The Finance Department (Expenditure -V)
5. The Finance Department (Budget).
6. Dr. R.D. Nanjajah, Director, Institute of Veterinary and Biological Research
Institute, Hesaraghatta,
7. Sri C.D. Krishnegowda, Curator, Mysore Zoo, Mysore
8. Sri N.S. Adkoli, No. 1116, 36D Cross, Tilaknagar, Bangalore.
9. Dr. M.R. Rajeskhara Setty, F.N.A., Professor and Head of the Department of
Zoology, University of Mysore, Mysore
10. The Chief Conservator of Forests (General), Bangalore
11. Conservator of Forests, Wildlife Preservation, Bangalore.
12. The Conservator of Forests, Mysore Circle, Mysore
13. The Weekly Gazette.
14. The Section Guard File.
15. The Section Compilation File.
16. Press Table.

PROCEEDINGS OF THE GOVERNMENT OF KARNATAKA

Sub:- Reconstitution of Society known as "Zoo Authority of Karnataka".

READ:

- 1) Govt. Order No: FFD/45/FWL/79 Dated: 19th July 1979.
- 2) Govt. Order No: FEE/204/FWL/2000 Dated: 17-5-2003.
- 3) G.O. No: FEE 189 FWL 2001, dt: 15-09-83.
- 4) Correspondence ending with Letter No: MSY/65/AMOA/2002/514 Dated: 01-08-2005 from the Member Secretary, Zoo Authority of Karnataka, Mysore.



Preamble:

In Government Order read (1) above, the Memorandum of Association and Rules of Zoo Authority of Karnataka, registered as a Society under Registration of Societies Act, 1960 were approved. In G.O dt: 17-05-2003 read (2) above, the Government Constituted the Governing Council of the Zoo Authority of Karnataka with 13 members.

In letter dt: 01-08-2005 read (4) above, the Chief Conservator of Forests, and member Secretary, Zoo Authority of Karnataka has requested to reconstitute the Society of Zoo Authority of Karnataka as resolved in 93 rd Governing Council meeting and in the Special General meeting of the Society as per G.O. dt: 17-05-2003 as read (3) above.

The Government have examined the proposal with reference to the composition of the Governing Council of Zoo Authorities of the neighbouring States and the fact that the Karnataka Zoo Authority is taking several initiatives like improving Bannerghatta National Park which required coordination among various Departments - Agencies of the Government like ITY Department, KSRTC / BMTC, Animal Husbandry and PD. Moreover, the Government of India has also sanctioned a Project called Bannerghatta Biological Park at a total cost of Rs. 20.00 crores which needs constant follow up and close coordination with the Government of India officers at the highest levels.

.....2.....

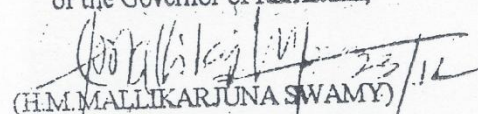
.....2.....
In view of the above, the Government has taken a decision to reconstitute the composition of "Zoo Authority" of Karnataka. Hence the following order.

GOVERNMENT ORDER NO: FEE 242 FWL 2005, BANGALORE. Dated: 23-12-2005.

1. Government. is pleased to reconstitute the composition of "Zoo Authority of Karnataka" under Rule 4 of the "Zoo Authority of Karnataka Rules".

Sl. No.	Members	Designation
1	Principal Secretary to Govt., Forest, Ecology & Environment Dept., Govt. of Karnataka	Chairman
2	PCCF(wl) and Chief wildlife warden, Bangalore	Member
3	Director, Institute of Animal Health & Vet. Biologicals, Bangalore	Member
4	Head of the Dept. of Zoology, University of Mysore	Member
5	Mayor, Mysore City Corporation	Member
6	Secretary to Government (Forest), Forest, Ecology and Environment Department, Bangalore.	Member
7	Secretary (Finance), Vidhana Soudha, Bangalore.	Member
8	Chief Engineer, PWD, Bangalore.	Member
9	Director, Dept. of Animal Husbandry & Vet. Services, Bangalore.	Member
10	3 Non-official Members to be nominated by the Govt.	Member
11	Member-Secretary, ZAK, Mysore.	Member Secretary

By the Order and in the name
of the Governor of Karnataka,


(H.M. MALLIKARJUNA SWAMY)
Under Secretary to Government,
Forest, Environment & Ecology Dept.

To:

- 1) The Accountant General (Audit I & II) Accounts and Entitlement, Karnataka. Bangalore.
- 2) The Principal Chief Conservator of Forests, Aranya Bhavan, Malleshwaram, Bangalore.
- 3) Principal Secretary to Government, Forest, Ecology & Environment Department.
- 4) Principal Chief Conservator of Forests (Wildlife), Aranya Bhavan, Malleshwaram, Bangalore.

.....3.....

... 3 ...

- 5) Private Secretary to Hon'ble Minister for Forest, Environment & Ecology Department, Vidhanasoudha, Bangalore.
- 6) The Secretary, Central Zoo Authority, Bikaner House, Shahajahan Road, New Delhi-110 011.
- 7) The Secretary, Ministry of Environment and Forests, Paryavaran Bhavan, CGO Complex, Lodi Road, New Delhi-110 011.
- 8) Director, Institute of Animal Health & Vet. Biologicals, Bangalore.
- 9) Head of the Dept. of Zoology, University of Mysore.
- 10) Mayor, Mysore City Corporation.
- 11) Secretary to Government (Forest), Forest, Ecology & Environment Department.
- 12) Secretary to Government, Finance Department, Vidhana Soudha, Bangalore.
- 13) Chief Engineer, PWD, Bangalore.
- 14) Director, Dept. of Animal Husbandry & Vet. Services, Bangalore.
- 15) Member-Secretary, Zoo Authority of Karnataka, Mysore.
- 16) Executive Director, Bannerghatta National Park, Bangalore.
- 17) Spare Copies.

GOVERNMENT OF KARNATAKA

EE 242 FWL/2005

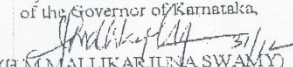
Karnataka Government Secretariat,
M.S. Building,
Bangalore, dated: 31-12-2005.

CORRIGENDUM

In G.O. No. FEE 242 FWL 2005, dated: 23-12-2005 in the first para of the order after the words "Zoo Authority of Karnataka under Rule 4" the following words shall be inserted.

"and also the Governing Council of Zoo Authority of Karnataka under rule-6 of the".

In the table at Sl. No. 2 under column, designation "Member" shall be read as "Vice Chairman".

By the Order and in the name
of the Governor of Karnataka,

(H.M. MALLIKARJUNA SWAMY)
Under Secretary to Government,
Forest, Environment & Ecology Dept.

To:

- 1) The Accountant General (Audit I & II) Accounts and Entitlement, Karnataka, Bangalore
- 2) The Principal Chief Conservator of Forests, Aranya Bhavan, Malleshwaram, Bangalore.
- 3) Principal Secretary to Government, Forest, Ecology & Environment Department.
- 4) Principal Chief Conservator of Forests (Wildlife), Aranya Bhavan, Malleshwaram, Bangalore.
- 5) Private Secretary to Hon'ble Minister for Forest, Environment & Ecology Department, Vidhanasoudha, Bangalore.
- 6) The Secretary, Central Zoo Authority, Bikaner House, Shahajahan Road, New Delhi-110 011.
- 7) The Secretary, Ministry of Environment and Forests, Paryavaran Bhavan, CGO Complex, Lodi Road, New Delhi-110 011.
- 8) Director, Institute of Animal Health & Vet. Biologicals, Bangalore.
- 9) Head of the Dept. of Zoology, University of Mysore.
- 10) Mayor, Mysore City Corporation.
- 11) Secretary to Government (Forest), Forest, Ecology & Environment Department.
- 12) Secretary to Government, Finance Department, Vidhana Soudha, Bangalore.
- 13) Chief Engineer, PWD, Bangalore.
- 14) Director, Dept. of Animal Husbandry & Vet. Services, Bangalore.
- 15) Member-Secretary, Zoo Authority of Karnataka, Mysore.
- 16) Executive Director, Bannerghatta National Park, Bangalore.
- 17) Spare Copies.

EXECUTIVE DIRECTOR



☎ Off. : 080 - 27828540

: 080 - 27828300

Fax: 080 - 27828400

Email: bannerghattazoo@gmail.com

BANNERGHATTA BIOLOGICAL PARK, BANNERGHATTA, BANGALORE -560 0 83

NO. A2/BBP/Advisory Committee/CR-1/2011-12

Date: 23/ 03/ 2012

OFFICIAL MEMORANDUM

Sub: Constitution of "**advisory committee**" for the management of Bannerghatta Biological Park-reg

Ref: 1. Rule 10 (A) of the Memorandum of Association and Rules of the Society of ZAK issued vide order No. FFD 45 FWL 79, Bangalore dated: 19th July 1979

2. G.O No. FEE.252.FWL.2002 dated: 28-04-2003



PREAMBLE

The Zoo Authority of Karnataka in the Memorandum of Association and Rules of the Society vide Rule 10(A) have provided to constitute an advisory committee for the local participation and management for each of the recognized zoos of Karnataka. The Chairman and the members to be appointed for the said advisory committee has been explained in the MoA of ZAK.

The government of Karnataka vide their order no cited under reference (2) have also clearly identified the different department officers of district level to involve meaningfully and contribute for the efficient governance of BBP in the different field of administration and management.

Accordingly, there is a need to constitute an advisory committee with immediate effect for the management of Bannerghatta Biological Park in the different disceplene. Hence the following order


ORDER

As explained in the preamble it is herewith ordered by constituting an advisory committee for the management of Bannerghatta Biological Park by including the following members.

SI.No.	MEMBERS	Designation
1.	Conservator of Forests, Bangalore Circle, Bangalore	Chairman
2.	The Executive Director, BBP, Bannerghatta	Member Secretary
3.	Deputy Commissioner, Bangalore Urban District.	Member
4.	Superintendent of Police, Bangalore Urban District.	Member

5.	The CEO of the Zilla Panchayath, Bangalore Urban District.	Member
6.	Deputy Director and District Officer of the Department of Animal Husbandry and Veterinary Sciences, Bangalore Urban District.	Member
7.	Head of the Department of Zoology, Bangalore University, Bangalore.	Member
8.	Superintending Engineer, PWD South Circle, Bangalore.	Member
9.	Pro. S.N. Hegde, Former Vice-Chancellor C/o Sri Amarnath. R. Shetty, 'Sri Sai Dhama', #50, RMV Judicial Officers Layout, Sanjaynagar, Bangalore - 560096 Phone: 32917961	Member
10.	Dr. S. Nagaraju Former Registrar, KVAFS University #20, 6 th Main Road, Srikanteswara Nagar, Nandini Layout Post, Bangalore 560 096	Member
11.	Deputy Director, BBP.	Member
The local officers of BBP shall be the member invitees.		

The above advisory committee shall advise on the management issues relating to health and upkeep of animals, maintenance, development and enhancement of resources. The committee shall also advise on gardening, plant diversity, controlled breeding program, population control, revenue and finance management, research, security and all other crucial management issues of BBP. The committee shall meet once in bimonthly or atleast once in quarter and submit recommendations to BBP, ZAK for further needful action. This committee shall come into force with immediate effect.


 (Dr. R. Raju) 23/03/2012
Executive Director,
Bannerghatta Biological Park,
Bannerghatta, Bangalore

Copy to

- Submitted, The Member Secretary, Zoo Authority of Karnataka, Mysore for kind information.
- The Conservator of Forests, Bangalore Circle, Bangalore
- The Deputy Commissioner, Bangalore Urban District
- The Superintendent of Police, Bangalore Urban District
- The CEO of the Zilla Panchayath, Bangalore Urban District
- District Officer of the Department of Animal Husbandry and Veterinary Sciences, Bangalore Urban District
- Head of the Department of Zoology, Bangalore University, Bangalore

P.T.O

Advosory cummittee

- The Superintending Engineer, PWD South Circle, Bangalore
- Pro. S.N. Hegde, Former Vice-Chancellor, C/o Sri Amarnath. R. Shetty, '**Sri Sai Dhama**', #50, RMV Judicial Officers Layout, Sanjaynagar, Bangalore – 560096, Phone: 32917961
- Dr. S. Nagaraju, Former Registrar, KVAFS University, #20, 6th Main Road, Srikanteswara Nagar, Nandini Layout Post, Bangalore 560 096
- The Deputy Director, BBP, Bannerghatta.
- Assistant Director (Veterinary Service), BBP, Bannerghatta
- Range Forest Officer, Zoo Range, BBP, Bannerghatta
- Range Forest Officer, Safari Range, BBP, Bannerghatta

Copy respectfully submitted to

- The Principal Chief Conservator of Forests and Head of Forest Force, Aranya Bhavan, Malleswaram, Bangalore for kind information
- The Principal Chief Conservator of Forests (Wildlife) and Chief Wildlife Warden, Aranya Bhavan, Malleswaram, Bangalore for kind information

EXECUTIVE DIRECTOR



☎ Off. : 080 - 27828540

: 080 - 27828300

Fax : 080 - 27828400

Email: bannerghattazoo@gmail.com

BANNERGHATTA BIOLOGICAL PARK, BANNERGHATTA, BANGALORE -560 0 83

NO. A2/BBP/Animal Health Management/2011-12

Date : 27/ 07/ 2011

OFFICIAL MEMORANDUM

Sub: - Constitution of "**animal health monitoring committee**" for managing the captive animals housed in BBP - reg.

Ref: - DO letter no. A2/ZAK/BBP/PEND/CR-11/2011-12 dated: 24-05-11 of the Member Secretary Zoo Authority of Karnataka, Mysore

Preamble

The management of health and hygienics of captive animals housed in various units of Bannerghatta Biological Park is a serious concern in the day to day management. The core principles of animal's welfare and ethics is based on the kind and quality of feeding done to these animals and kind and quality of enclosure we provide in the captive setup. Most of the time it is noticed that the diet of these animals are inadequately planned and unmanaged seasonally and scientifically as per the requirement and thus leading to various kinds of biological problems leading to untimely deaths.

The following are the basic principles normally to be followed in managing the captive animals in zoo, safari and animal Rescue Centre.

1. Providing freedom from pain, injury and diseases through an appropriate preventive and responsive veterinary intervention.
2. Ensuring the freedom from hunger and thirst by providing timely food with required quality and quantity by fixing Nutritious diet and free access to clear and potable water.
3. Ensuring freedom from thermal and physical discomfort through the provision of optimum temperature, shade and beddings.

4. Ensuring freedom from fear and distress through a positive reinforcement, calm and gentle handling and total prevention of negative interaction such as shouting, beating, bad handling etc.,
5. Facilitating to express normal behaviour through a meaningful enrichment programme and appropriate enclosure design.

Although the inmate animals are traditionally managed on day today basis, the nutritious diet, health, hygienic are to be ensured apart from initiating adequate steps to diagnose, treat, and provide prophylactic measures to these animals is the demand of the present situation. Therefore it was felt necessary to constitute an expert committee by involving the qualified and competitive professionals from the various fields of veterinary science and husbandry. Accordingly the following committee is proposed for constitution.

ORDER

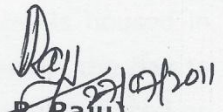
It is hereby ordered to constitute a committee called "**captive animal health monitoring committee**" by involving the following experts under the chairmanship of the Executive Director, Bannerghatta Biological Park

"CAPTIVE ANIMAL HEALTH MONITORING COMMITTEE"

- | | | |
|----|--|-----------------|
| 1. | Dr. R. Raju, IFS,
Executive Director, BBP | Chairman |
| 2. | Dr. Yathiraj,
Dean, Veterinary Collage Hebbal, Bangalore | Member |
| 3. | Dr Renuka Prasad,
Director, IAH&VB , Hebbal, Bangalore | Member |
| 4. | Dr. D .M.R Gajendragad,
Principal Scientist, PD-ADMAS, Bangalore | Member |
| 5. | Dr. Narayana Bhat,
Director, Institute of Wildlife Veterinary
Research, Kudige | Member |
| 6. | Dr. Nadheem,
HoD, Meat Science, Veterinary Collage Bangalore | Member |
| 7. | Dr. B.C. Chittiyappa
Asst. Director (VS), BBP | Member Convenor |

Conditions:-

1. This committee shall sit once in two months to assess the situation and manage such emergency monitoring, if any as and when required.
2. Each member of the committee (except ED, BBP) are eligible to claim Rs. 1000/- for each sitting on the basis of attendance.
3. Absence of two consecutive meeting by any member is liable for termination.
4. The committee has the discretion to work out the scientific diet and fix accordingly as and when required.
5. The committee shall fix the treatment plan for all the ailing, weakling disabled, deformed animals housed in the Bannerghatta Biological Park in the day to day management.
6. Member Convenor to organise the periodical meetings at the regular interval or as and when such situation warranted in due consultation with chairman of this committee.


(Dr. R. Raju)
**Executive Director,
Bannerghatta Biological Park,
Bannerghatta, Bangalore**

Copy submitted to:-

- The Member Secretary, Zoo Authority of Karnataka, Mysore.
- Dr. Yathiraj, Dean, Veterinary Collage Hebbal, Bangalore.
- Dr Renuka Prasad, Director, IAH&VB , Hebbal, Bangalore.
- Dr. D.M.R Gajendragad, Principal Scientist, PD-ADMAS, Bangalore.
- Dr. Narayana Bhat, Director, Institute of Wildlife Veterinary Research, Kudige.
- Dr. Nadheem, HOD, Meat Science, Veterinary Collage Bangalore.

Animal Health Monitoring Committee

GP. 16 701/fel07

30/10/07 @

F. No. 11-66/2004-FC
Government of India
Ministry of Environment and Forests
(FC Division)

Paryavaran Bhawan,
CGO Complex, Lodhi Road.
New Delhi - 110 003.
Dated : 13.11.2007.

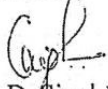
To
The Principal Secretary / Secretary (Forests),
(All States / UTs).

Sub: **Applicability of Forest (Conservation) Act, 1980 for activities that are necessary for ex-situ conservation of wild animals including upkeep and management of animals through Zoological Parks / Zoos / Biological Parks over forest land.**

Sir,

The Ministry of Environment and Forests, Government of India has been receiving number of representations seeking clarification in respect of applicability of Forest (Conservation) Act, 1980 for activities that are necessary for ex-situ conservation of wild animals including upkeep and management of animals through Zoological Parks / Zoos / Biological Parks located in forest areas.


After careful examination of the proposal of the respective Chief Wildlife Wardens of various State Governments and on the basis of the recommendations of the Forest Advisory Committee, the Central Government hereby conveys that activities required to be done in zoo as per the approved management plan will not attract the provisions of the Forest (Conservation) Act, 1980 provided such activities are necessary for management of animals & imparting education and have the prior approval of CZA.


(C.D. Singh)

Assistant Inspector General of Forests

Copy to:-

1. The Principal Chief Conservator of Forests, All States / UTs.
2. The Nodal Officer (FC), O/o the PCCFs, All States / UTs.
3. All Regional Offices of MoEF located at Bhopal, Shillong, Bangalore, Bhubaneshwar, Lucknow and Chandigarh.
4. The RO (HQ), MoEF, New Delhi.
5. Monitoring Cell, FC Division, MoEF, New Delhi.
6. Guard File.


(C.D. Singh)

Assistant Inspector General of Forests

Letter regarding the applicability of FCA

Proceedings of the Meeting held on 29.11.2011 at the Chambers of Managing Director, Jungle Lodges & Resorts Ltd., Khanij Bhavan, Bangalore to resolve the issue of operating the KSTDC Cafeteria located within the Zoo Unit of Bannerghatta Biological Park.

Members Present:

1. Sri.N.D.Tiwari, IFS., in-Chair
APCCF & MD, JLR Ltd.,
2. Sri.S.Sundar Naik, IFS.,
APCCF & MD, KSTDC Ltd.,
3. Sri.Sanjai Mohan, IFS.,
CCF & ED, JLR Ltd.,
4. Dr.R.Raju, IFS.,
CF & ED, BBP, Bannerghatta
5. Sri.D.M.Shivakumar
G.M, KSTDC Ltd.,


Sri.N.D.Tiwari, Managing Director, Jungle Lodges & Resorts Ltd., welcomed the members present in the meeting and requested CF & ED, BBP to present the issue for deliberations.


Dr.R.Raju, ED, Bannerghatta Biological Park presented the following facts in the meeting.


1. The Zoo evaluation Committee constituted by the CZA, New Delhi have evaluated the Zoo unit of Bannerghatta Biological Park during 2010-11 and objected for the existence of restaurant within the Zoo and advised to separate it from the Zoo. The compliance is still pending.
2. The Bannerghatta Biological Park, Management Plan is also not been approved because of not observing some of the observations made by the CZA evaluation Committee.
3. The CZA evaluation Committee, which conducted the evaluation in BBP, on 13/14.10.2011 also, reiterated the same observations and made a final call to follow the CZA guidelines and the mandates stipulated in the National Zoo Policy as for as dealing the Zoo restaurants, Cafeteria etc., At the time of furnishing the on spot reply by the Executive Director, BBP to evaluation team it was stated to treat the existing cafeteria of KSTDC (run by JLR) as part of administrative block of BBP, so that the existing Cafeteria is amalgamated in the administrative block and may continue to carry on its activity as agreed in the MOU.

The Members, after detailed discussions agreed and resolved to spare the required space in the said building to accommodate the BBP office at the right wing of the KSTDC restaurant and the occupation may be effected immediately. The JLR authorities have requested to adjust the rent being paid presently towards the proposed occupation and it was agreed to consider by getting orders from the Competent authority.

Meeting concluded with thanks.


(Dr. R. Raju)
ED, BBP


(Sunder Naik)
MD, KSTDC


(N.D. Tiwari)
MD, JLR

Proceedings regarding the operating catereria

List of flora and fauna in the limits of Bannerghatta Biological Park

a) List of flora in the limits of Bannerghatta Biological Park

BOTANICAL NAME	LOCAL NAME (Kannada)	FAMILY	UTILITY VALUE
A			
<i>Abrus precatorius</i>	culganji	Leguminosae	Medicinal
<i>Acacia Ferruginea</i>	Banni	Leguminosae	Firewood/Timber.
<i>Acacia arabica (nilotica)</i>	Gkobli, Karijali	Leguminosae	-- do --
<i>Acacia leucopholea</i>	Thapala	Leguminosae	-- do --
<i>Acacia catechu</i>	Kaggali, Katchu	Leguminosae	Medicinal
<i>Acacia caesia (intsia)</i>	Kaduseege	Leguminosae	Fodder
<i>Acacia suma</i>	Muluvara, Bilijai	Leguminosae	Fuel wood
<i>Acacia concinna</i>	Seege	Leguminosae	MFP
<i>Acacia latronum</i>	Naigobbali	Leguminosae	Fuel wood
<i>Acalypha indica</i>	Kuppigida	Euphorbiaceae	Cold, Gynological Problems.
<i>Adina cordifolia</i>	Yethiga	Rubiaceae	Timber
<i>Adhatoda vasica</i>	Adusoge	Acantheceae	Bronchitis, Cold
<i>Aegle marmelos</i>	Bilvapatre	Rutaceae	Medicinal
<i>Agave sisalana</i>	Kathale (sisal)	Amaryllidaceae	Fibre
<i>Agave americana</i>	Bootale	Amaryllidaceae	Fibre
<i>Ailanthus excelsa</i>	Boddamara	Simarubaceae	Match stick
<i>Alangium lamarckii</i> (<i>Salvifolium</i>)	Ankole	Alangiaceae	Medicinal.
<i>Albizzia procera</i>	Bellatte	Leguminosae	Timber
<i>Albizzia lebbek</i>	Bage	Leguminosae	Timber

<i>Albizzia amara</i>	Ghujjalu	Leguminosae	Firewood
<i>Albizzia odoratissima</i>	Bilwara	Leguminosae	Timber
<i>Anogeissus latifolia</i>	Dindiga, Dindlu	Combretaceae	Firewood/Gum
<i>Andropogon serratus</i>	Darbehullu	Gramineae	Fodder
<i>Anacardium occidentale</i>	Godambi	Anacardiaceae	Food
<i>Annona squamona</i>	Seethaphala	Anonaceae	Food
<i>Apluda mutica</i>	Grass	Poaceae	Gramineae
<i>Aporosa lidleyana</i>	Challe	Euphorbiaceae	Gum
<i>Aristolocia indica</i>	Easwari balli	Aristolochiaceae	Medicinal
<i>Asparagus racemosus</i>	Sathavari	Liliaeae	Medicinal
<i>Atalanta monophylla</i>	Kadu-nimbe	Rutaceae	Medicinal
<i>Atalanta racemosa</i>	Kadu-kanchi	Rutaceae	Medicinal
<i>Azadirachta indica</i>	Bevu	Meliaceae	Medicinal/Timber
<i>Artocarpus integrifolia</i>	Halasu	Urticaceae	Food/Timber
B			
<i>Bacopa monnieri</i>	Brahmi	Scrophulariaceae	Tonic, Mental disease, Nerves
<i>Bassia latifolia</i> (Madhuca indica)	Ippe, Helippe	Sapotaceae	Timber/Fodder
<i>Bassia longifolia</i> (Madhuca longifolia)	Kadippe	Sapotaceae	Timber
<i>Bambusa arundinacea</i>	Bombu, Hebbiduru	Gramineae	Fodder
<i>Bauhinia purpurea</i>	Kanchuvala,	Leguminosae	Fodder
<i>Bauhiia racemosa</i>	Kanchuvala, Achiga	Leguminosae	Fodder
<i>Boswellia serrata</i>	Bilidhupa, Maddi	Burseraceae	Pulpwood
<i>Bombax malabaricum</i>	Buruga	Malvaceae	Medicinal

<i>Bothriochloa pertusa</i>	Grass	Poaceae	Fodder
<i>Bridelia retusa</i>	Bettadanally	Euphorbiaceae	Timber
<i>Bucchanania latifolia</i>	Marukalu, Murke	Anacardiaceae	Fire wood
<i>Butea Superba</i>	Liane	Leguminosae	Medicinal
<i>Butea monosperma</i>	Muthuga mutigina,	Leguminosae	Fire wood
<i>Bucchanania angustifolia</i> Remurkalu, Mardippu Anacardiaceae Fire wood	Remurkalu, Mardippu	Anacardiaceae	Fire wood
C			
<i>Cassia auriculata</i>	Avarike, Thangadi	Leguminosae	Medicinal
<i>Cassia tora</i>	Chagache	Leguminosae	Mannur
<i>Carissa caranda</i>	Kabli, Kawli	Apocynaceae	Medicinal
<i>Careya arborea</i>	Kowlu, Doddal	Myrtaceae	Fire wood
<i>Calotropis gigantea</i>	Yukka	Asclepiadaceae	Medicinal
<i>Calycopteris floribunda</i>	Neerballi	Cobretaceae	Fodder
<i>Canthium didymum</i>	Heddarane	Rubiaceae	Medicinal
<i>Capparis stylosa</i>	Hnsaudlimullu	Capparidaceae	Medicinal
<i>Cassia fistula</i>	Kakke	Leguminosae	Medicinal
<i>Cassia mimosoides</i>	Herb	Caesalpiniaceae	Medicinal
<i>Casearia esculenta</i>	Ekanayakanagida	Flacourtiaceae	Diabetes, Fever.
<i>Caesalpinia mimosoides</i>	Kenjaga	Leguminosae	Medicinal
<i>Cassia Siamea</i>	Seemathangadi	Leguminosae	Fire wood
<i>Casuarina equisetifolia</i>	Survey, Cahmbakumara	casuarinaceae	Fire wood
<i>Caesalpinia pulcherrima</i>	Peacock flower	Caesalpiniaceae	Infant culvuisian, Intestinal worms,
<i>Ceiba pentandra</i>	Seemburga, silk	Celastraceae	Cotton semal,

			Match wood
<i>Cedrela toona</i>	Gandhagarige	Meliaceae	Timber
<i>Centella asiatica</i>	Ondelaga (Brahmi)	Umbelifere	Medicinal
<i>Chloroxvlong swietenia</i>	Hurugalu, Birligida	Meliaceae	Snake bite
<i>Cipadessa baccifera</i>	Chittunde	Meliaceae	Green manure
<i>Cordia myxa</i>	Challe	Boraginaceae	Gum/fruit
<i>commiphora caudata</i>	Kondamavu, Aswal	Burseraceae	Soft wood
<i>cocholospermum gossypium</i>	Bettadabare	Bixaceae	Soft wood
<i>Cochlospermium religiosum</i>	Bettadevara	Bixaceae	Soft wood
<i>Cryptolepis buchanani</i>	Haluballi	Asclepiadaceae	--
<i>Cymbopogon citratus</i>	Lemon grass	Gramineae	Medicinal
<i>Cymbogon martini</i>	Rosha grass	Gramineae	Fodder
<i>Cymbopogon flexosus</i>	Grass	Poaceae	Fodder
<i>Cynodum dactylon</i>	Garike	Poaceae	Medicinal
D			
<i>Dalbergia paniculata</i>	Pacchali, Belaga	Leguminosae	Timber
<i>Dalbergia latifolia</i>	Beete	Leguminosae	Timber
<i>Dalbergia lanceolaria</i>	Hasarugani	Leguminosae	--
<i>Dalbergia sissoo</i>	Sissoo	Leguminosae	Timber
<i>Datura-stromenium</i>	Datura	Solanaceae	Medicinal
<i>Dillenia pentaguna</i>	Kattegko kanagalu	Dilleniaceae	Fire wood
<i>Diospyros montanna</i>	Jagalaganti	Ebenaceae	Fire wood
<i>Diospyros melanoxyton</i>	Thupra, Bidiele	Ebenaceae	Beedi leaf
<i>Dodonaea viscosa</i>	Bandarike Kanagalu	Sapindaceae	Brooms

<i>Digitaria adscendens</i>	Grass	Poaceae	Fodder
<i>Digitaria Setigera</i>	Grass	Poaceae	Fodder
<i>Digitaria ternata</i>	Grass	Poaceae	Fodder
<i>Desmodium triflorum</i>	Herb	Fabaceae	--
<i>Decoschistia crotonifolia</i>	Herb	Malvaceae	--
E			
<i>Elaeodendron glaucum</i>	Mukarathi	Celastraceae	Fire wood
<i>Erythroxylog monogynum</i>	Devadari	Linaceae	Fire wood
<i>Erythrina subrosa</i>	Mulmuthug	Fabaceae	Fire wood
<i>Erythrina vaiegata</i>	Honggarike,	Fabaceae	Match wood
<i>Euphorbia tirukalli</i>	Kalli	Euphorbiaceae	Medicinal
<i>Eugenia jambolana</i>	Neralu	Myrtaceae	Medicinal
<i>Eucalyptus tereticornis</i> (Mysore hybrid)	Hybrid Nilgire	Myrtaceae	Pulp wood
<i>Eucalyptus citriodora</i>	Neelagiri	Myrtaceae	Medicinal
<i>Eucalyptus grandis</i>	Neelgiri	Myrtaceae	Pulpwood
<i>Emblica officinalis</i> (<i>Phyllanthus emblica</i>)	Nelli	Euphorbiaceae	Medicinal
<i>Eupatorium glandulosum</i> (<i>Eupatorium Odoratum</i>) Bili Roja,	Billi Roja (<i>Eupatorium</i>)	Compocetae.	--
<i>Euphorbia species</i>	Yelli-Kalli, Muedu-Kalli	Euphorbiaceae	--
F			
<i>Feronia elephantum</i>	Bela	Rutaceae	Fruit
<i>Ficus infectoria</i>	Basari (Kappu)	Urtioaceae	Fire wood

<i>Ficus religiosa</i>	Arali	Urticaceae	Fire wood
<i>Ficus tsiela</i>	Basari (bili)	Urticaceae	Fire wood
<i>Ficus benabalensis</i>	Ala	Urticaceae	Fire wood/Timber
<i>Ficus glomerata</i>	Atti	Urticaceae	Fire wood
<i>Ficus mysorensis</i>	Goni	Urticaceae	Fire wood/Timber
G			
<i>Gardenia gummifera</i>	Bikke	Rubiaceae	Medicinal
<i>Gardenia latifolia</i>	Adavibekke	Rubiaceae	Fruit
<i>Garuga pinnata</i>	Godda	Burseraceae	Soft wood
<i>Gloriosa superba</i>	Kolikalu	Liliaceae	Medicinal
<i>Gmelina arborea</i>	Shivane, gamhar	Verbenaceae	Timber
<i>Grewia tiliaefolia</i>	Tadasalu	Tiliaceae	Bark - fodder
<i>Grewia glabra</i> (Goewia <i>laevigata</i>)	Karki, Gurgani	Tiliaceae	--
<i>Grevillea robusta</i>	Silveroak	Proteaceae	--
<i>Gymnosporia montana</i>	Thandarasi	Celastraceae	--
<i>Gymnema sylvistre</i>	Madhu nashini	Asclepiadaceae	Diabetes, Herpes.
H			
<i>Hardwickia binata</i>	Kamara, Karachi	Leguminosae	Fodder/Timber
<i>Helicteres isora</i>	Kowry, Edamuri, Balmuri	Sterculiaceae	--
<i>Hemidesmus indicus</i>	Sogadeberu/ Makaliberu	Asclepiadaceae Medicinal	
<i>Heteropogon contortus</i>	Grass	Poaceae	Fodder
<i>Hemidesmus indicus</i>	Sogade beru OR Haluballi	Periplocaceae	Skin diseaces,

<i>Holoptelea integrifolia</i>	Thapasi	Urticaceae	Fire wood
I			
<i>Imperata arundnacea</i>	Elephant grass	Graminae	Fodder
<i>Ixora parviflora</i>	Goravi	Rubiaceae	--
J			
<i>Jasminum arborescens</i>	Mallige	Oleaceae	flowers
<i>Jatropha curcas</i>	Turkkuharalu/Hadu	Euphorbiaceae	Medicinal
<i>Jasminum officinale</i>	Kadu mallige	Oleaceae	Ring worm,
K			
<i>Kydia calycina</i>	Bende	Malvaceae	Fodder
L			
<i>Lagerstroemia lanceolata</i>	Nandi	Lythraceae	Timber
<i>Lagerstroemia parviflora</i>	Channangi	Lythraceae	Timber
<i>Lagerstroemia flos-reginae</i>	Holedasavala	Lythraceae	Timber
<i>Lantana camara</i>	Rojagida, Lantana	Verbenaceae	Fodder
<i>Lanea coromandalica</i>	Gojjal, Hohi, amte	Lamiaceae	Food
<i>Leucas aspera</i>	Thumbe	Labiatae	Medicine
<i>Lettosomia thomsoni</i>	Uganihambu	Convolvulaceae	Green manure
<i>Limonia acidissima</i>	Naibela	Rutaceae	--
<i>Lawsonia intermis</i>	Madarangi (Goranti)	Lythraceae	Skin disease,
<i>Loranthus spp.</i>	Badanike	Loranthaceae	--
M			
<i>Mallotus philippinensis</i>	Kapilarangu, Kulokum	Euphorbiaceae	
<i>mangifera indica</i>	Mavu	Anacardiaceae	
<i>Melia composita</i>	Huenbevu	Meliaceae	

<i>Michelia champaca</i>	Sampige	Magnoliaceae
<i>Mitragyna parviflora</i>	Kadavala	Rubiaceae
<i>Morinda tinctoria</i>	Maddi	Rubiaceae
O		
<i>Ochlandra rheedia</i>	Reed, Wateamme	Gramineae
<i>Ocimum sanctum</i>	Sritulasi	Labiatae
<i>Ocimum adsceudens</i>	Bilitulasi	Labiatae
<i>Opuntia dillenji</i>	Papaskalli	cacctaceae
P		
<i>Paspalidium flavidum</i>	Grass	Poaceae (Gramineae)
<i>Parthenium spp.</i>	Parthenium	Compocelae
<i>Phoenix humilis</i>	Kirichalu	Palmaceae
<i>Phoenix sylvestris</i>	Eechalumara,	Palmaceae Wild data tree
<i>Pithecolobium dulce</i>	Kaduhunse, Seemehunse	Leguminosae
<i>Pulmeria acutifolie</i>	Kangalu	Apocynaceae
<i>Pongamia glabra</i>	Honge	Leguminosae
<i>Portutaca pillosa</i>	Grass	Portulucaceae
<i>Polyalthia cerasoides</i>	Tree	Annonaceae
<i>Premna tomentosa</i>	Eajeemara	Verbenaceae
<i>Prosopis juliflora</i>	Ballari jali	Leguminosae
<i>Psidium guyava</i>	Seebe	Myrtaceae
<i>Pterolobium indicum</i>	Badabakka	Leguminosae
R		
<i>Randia uliginsoa</i>	Kare	Rubiaceae

<i>Randia dumetorum</i>	Kare	Rublanceae
<i>Radermachera xylocarpa</i>	Genasu	Bignoniaceae
S		
<i>Salix tetrasperma</i>	Nirajimara	Slicaceae
<i>Samanya saman</i>	Raintree	Leguminosae,
<i>Sapindus emarginata</i>	Antuvala	Sapindaceae
<i>Santalum album</i>	Santal, Gandha	Santalaceae
<i>Saccopetalum tomentosum</i>	Hesara, Ubalu	Anonaceae
<i>Scheleichera trijuga</i>	Sagade, Kendala	Sapindaceae
<i>Schleichera oleosa</i>	Sagade	Sapindaceae
<i>Scherebera swietenoides</i>	Gante	Oleaceae
<i>Scutia indica</i>	Kurudi	Rhamnaceae
<i>Semecarpus anacardium</i>	Geru, Marking nut	Anacardiaceae
<i>Setaria palmifolia</i>	Grass	Poaceae
<i>Sida rhombifolia</i>	Herb	Malvaceae
<i>Solanum ferox</i>	Gullabadane	Solanaceae
<i>Soymida febrifuga</i>	Some mara	Meliaceae
<i>Solanum indicum</i>	Sonde	Solanaceae
<i>Sporobolus wallichii</i>	Grass	Poaceae
<i>Sterculia urens</i>	Kempudale, Bhutale	Stayphyleaceae
<i>Sterculia villosa</i>	Billidale	Stayphyleaceas
<i>Stereospermum suaveolens</i>	Kaladri, Padri. Hanse	Bignoniaceae
<i>Streblus asper</i>	Mitbi	Urticaceae
<i>Strobilanthes asperimus</i>	Herb	Acauthaccae
<i>Strychnos nuxvomica</i>	Nanjankordu, Etti	Loganiaceae

<i>Shorea talura</i>	Shavige/Jalari	Sterculiaceae
<i>Syzigium utilis</i>	Henneralu, Henneri	Symplocaceae
T		
<i>Tamarindus indica</i>	Hunse	Leguminosae
<i>Tectona grandis</i>	Sagavani, Tega	Verbenaceae
<i>Terminalia chebula</i>	Alale	Combretaceae
<i>Terminalia arjuna</i>	Torematti, Billimatti	Combretaceae
<i>Terminalia paniculata</i>	Hunalu, Hulube, Marwa	Combretaceae
<i>Terminalia tomentosa</i>	Malli	Combretaceae
<i>Terminalia belerica</i>	Shanti, Tate	Combretaceae
<i>Terminalia catappa</i>	Badami	Combretaceae
<i>Tetrameles nudiflora</i>	Bondale, Kadbende,	Begoniaceae
<i>Thespesia populnea</i>	Jarmala Huvarsi(Bugarimara)	Malvaceae
<i>Themada cymbaria</i>	Grass	Poaceae (Gramineae)
<i>Themeda triandra</i>	Grass	Poaceae (Gramineae)
<i>Todolia asiatica</i>	Katrigida	Rulaceae
<i>Trema orientalis</i>	Budikere, Gorakalu	Ulmaceae
V		
<i>Vanda Spp.</i>	Seethale gida	Orchidaceae
<i>Vitex negundo</i>	Lakki	Verbenaceae
<i>Vitex altissima</i>	Naviladi	Verbenaceae
W		
<i>Withania somnifera</i>	Hire-maddinagida	Solanaceae
<i>Wrightiatinctoria</i>	Hale	Apocynaceae

Z		
Zizyphus jujuba	Bore, Yelachi	Rhamnaceae
Zizyphus xylopyra	Chotte	Rhamnaceae
Zizyphus trinervia	Chotte	Rhamnaceae
Zizyphus oenoplia	Paragi	Rhamnaceae

b) List of animals sighted in the Bannerghatta Biological Park

Mammals		
	Common name	Scientific name
1	Leopard,	<i>Panthera pardus</i>
2	Elephant,	<i>Elephus maximus</i>
3	Spotted Deer	<i>Axis axis</i>
4	Sambar,	<i>Cervus unicolor</i>
5	Bonnet Macaque,	<i>Macaca radiata</i>
6	Slender loris	<i>Loris lardiata</i>
7	Jungle Cat	<i>Felis chaus</i>
8	Common Mongoose	<i>Herpestes edwardsi</i>
9	Jackal,	<i>Canis aureus</i>
10	Wild Dog,	<i>Cuon alpinus</i>
11	Sloth Bear,	<i>Melurus ursinus</i>
12	Indian Porcupine	<i>Hystrix indica</i>
13	Indian Hare	<i>Lepus nigricollis</i>
14	Gaur	<i>Bos gaurus</i>
15	Barking Deer,	<i>Muntiacus muntjak</i>
16	Wild Boar,	<i>Sus scrofa</i>
17	Pangolin	<i>Manis crassicaudta</i>

18	Flying Fox	<i>Pteropus giganteus</i>
19	Three striped palm squirrel	<i>Funambulus palmarum</i>
Reptiles		
20	Rock Python	<i>Python molarus</i>
21	Cobra	<i>Naja naja</i>
22	Russels Viper	<i>Vipera russellii</i>
23	Land Monitor Lizard,	<i>Varanus bengalensis</i>
24	Rat Snake,	<i>Plyas mucosus</i>
25	Krait,	<i>Elapidie</i>
26	Crocodiles,	<i>Crocodilus spp</i>
27	Tortoise,	<i>Testudinidae</i>
Amphibians		
28	Salamander	
29	Toads,	<i>Nectophrynyoides</i>
30	Frogs,	<i>Rana spp</i>

c) List of birds sighted in the Bannerghatta Biological Park

Family and scientific name	Common name (English).
Family: Ardeidae	
- Ardea Cinerea	Grey Heron
- Ardeola grayii	Pond Heron
- Egretta garzetta	Little Egret
Family : Accipitridae	
- Milvus migrans govinda	Pariah Kite
- Haliastur indus	Brahminy Kite
- Neophron perchopterus	Scavenger Vulture
Family : Phasianidae	

- <i>Francolinus Pondicerianus</i>	Grey partridge
- <i>Perdica erythrorhyncha</i>	Painted Bush Quail
- <i>Gallus sonneratii</i>	Grey Junglefowl
- <i>Pavo Cristatus</i>	Common Peafowl
Family : Rallidae	
- <i>Amourornis phoenicurus</i>	Whitebreasted Waterhen
- <i>Gallinula Chloropus</i>	Indian Moorhen
Family : Burhinidae	
- <i>Burhinus oedicephalus</i>	Stone Curlew
Family : Charadriidae	
- <i>Vanellus indicus</i>	Redwattled Lapwing
- <i>Vanellus malabaricus</i>	Yellow-wattled lapwing
- <i>Charadrius dubius</i>	Little ringed Plover
- <i>Tringa ochropus</i>	Greenshank
Family : Columbidae	
- <i>Treron pompadora</i>	Greyfronted Green Pigeon
- <i>Treron Phoenicoptera</i>	Yellowlegged Green Pigeon
- <i>Ducula badia</i>	Imperial Pigeon
- <i>Columba livia</i>	Blue Rock Pigeon
- <i>Streptopelia decacto</i>	Indian Ring Dove
- <i>Streptopelia chinensis</i>	Spotted dove
- <i>Streptopelia senegalensis</i>	Little Brown Dove
Family : Psittacidae	
- <i>Psittacula Krameri</i>	Roseringed Parakeet
- <i>Psittacula cyanocephala</i>	Blossombeaded Parakeet
- <i>Loriculus vernalis</i>	Indian Lorikeet
- <i>Psittacula columboides</i>	Bluewinged Parakeet

Family : Cuculidae	
- Clamator jacobinus	Pied Crested Cuckoo
- Cuculus varius	Common Hawk-Cuckoo
- Eudynamys scolopacea	Koel
- Centropus sinensis	Crow-pheasant
- Centropus toulou	Lesser Coucal
Family : Strigidae	
- Bubo zeylonensis	Brown Fish Owl
- Glaucidium radiatum	Barred Jungle Owlet
- Athene brama	Spotted Owlet
- Strix ocellata	Mottled Wood Owl
Family : Caprimulgidae	
- Caprimulgus indicus	Indian Jungle Nightjar
- Caprimulgus macrourus	Longtailed Night jar
Family : Apodidae	
- Collocalia unicolor	Indian Edible - nest Swiftlet
- Apus melba	Alpine Swift
- Apus affinis	House Tree Swift
Family : Alcedinidae	
- Ceryle rudis	Lesser Pied Kingfisher
- Alcedo atthis	Small Blue Kingfisher
Family : Meropidae	
- Merops orientalis	Small Green Bee-eater
-Nyctyornis athertoni	Blue bearded Bee-eater
Family : Coraciidae	
- Coracias bengalensis	Indian Roller
Family : Upupidae	

-Upupa epops	Hoopoe
Family : Bucerotidae	
- Tockus birostris	Common Grey Hornbill
Family : Capitonidae	
- Megalaima viridis	Small Green Barbet
Family : Picidae	
- Micropternus brachyurus	Rufous Woodpecker
- Picoides maharattensis	Yellowfronted Pied Woodpecker
- Picoides nanus	Pygmy Woodpecker
Family : Pitidae	
- Pitta brachyura	Indian Pitta
Family : Alaudidae	
- Mirafra affinis	Madras Bush Lark
- Eremopterix grisea	Ashycrowned Finch-Lark
Family : Hirundinidae	
- Hirundo rustica	Common Swallow
- Hirundo smithii	Wiretailed Swallow
Family : Oriolidae	
- Oriolus Oriolus	Golden Oriole
- Oriolus xanthornus	Blackheaded Oriole
Family : Dicruridae	
- Dicrurus adsimilis	Black Drongo
- Dicrurus leucophaeus	Grey Drongo
- Dicrurus caerulescens	Whitebellied Drongo
- Dicrurus aeneus	Bronzed Drongo
- Dicrurus paradiseus	Greater Racket - tailed Drongo
Family : Artamidae	

- <i>Artamus fuscus</i>	Ashy Swallow Shrike
Family : Sturnidae	
- <i>Sturnus malabaricus blythii</i>	Whiteheaded Myna
- <i>Sturnus pagodarum</i>	Blackheaded Myna
- <i>Acridotheres tristis</i>	Indian Myna
Family : Corvidae	
- <i>Dendrocitta vagabunda</i>	Indian Tree Pie
- <i>Corvus splendens</i>	House Crow
- <i>Corvus machrorhynchos</i>	Jungle Crow
Family : Campephagidae	
- <i>Hemipus picatus</i>	Pied Flycatcher Shrike
- <i>Tephrodornis Virgatus</i>	Large Wood Shrike
- <i>Tephrodornis pondicerianus</i>	Common Wood Shrike
- <i>Pericrocotus flammeus</i>	Scarlet Minivet
- <i>Pericrocotus cinnamomeus</i>	Small Minivet
Family : Irenidae	
- <i>Chloropsis aurifrons</i>	Goldfronted Chloropsis
- <i>Chloropsis cochinchinensis</i>	Jerdons's Chloropsis
Family : Pycnonotidae	
- <i>Pycnonotus Priocephalus</i>	Greyheaded Bulbul
- <i>Pycnonotus jocosus</i>	Redwhiskered Bulbul
- <i>Pycnonotus Cafer</i>	Redvented Bulbul
- <i>Hipsepetus madagaseariensis</i>	Black Bulbul
Family : Muscicapidae	
- <i>Pellorneum ruficeps</i>	Spotted Babbler
- <i>Dumetia hyperythra</i>	Whitethroated Babbler
- <i>Chrysomma sinense</i>	Yellow - eyed Babbler

- Turdoides Caudatus	Common Babbler
- Muscicapa latirostris	Brown Flycatcher
- Muscicapa parva	Redbreasted Flycatcher
- Muscicapa thalassina	Verditer Flycatcher
- Hypothymus azurea	Blacknaped Blue Flycatcher
- Prinia hodgsonii	Franklin's Wren Warbler
- Prinia subflava	Indian Wren Warbler
- Orthotomus sutorius	Tailor bird
- Copysychus saularis	Magpie Robin
- Phoenicurus ochrurus	Black Redstart
- Saxicola torquata	Stone Chat.
- Saxicoloides fulicata	Indian Robin
- Monticola solitarius	Blue Rock Thrush
- Myoiphonmus horsfieldii	Malabar Whistling Thrush
- Turdus merula	Blackbird
Family: Paridae	
- Parus nuchalis	Yellowcheeked Tit
Family: Sittidae	
- Sitta castanea	Chestnutbellied Nuthatch
Family : Motacillidae	
- Motacilla cinerea	Grey Wagtail
- Motacilla maderaspatensis	Large Pied Wagtail
Family : Dicaeidae	
- Dicaeum erythrorhyncos	Tickell's Flowerpecker
- Dicaeum concolor	Plaincoloured Flowerpecker
Family : Nectarinidae	

- Nectarinia zeylonica	Purplerumped Sunbird
- Nectarinia minima	Small Sunbird
Family : Zosteropidae	
- Zosterops palpebrosa	White-eye
Family : Ploceidae	
- Paser domesticus	House Sparrow
- Ploceus philippinus	Baya Weaver Bird
- Lonchura malabarica	Whitethroated Munia
- Lonchura striata	Whitebacked Munia
- Lonchura punctata	Spotted Munia
Family : Fringilidae	
- carpodacus erythrinus	Common Rosefinsch.

d) List of butterflies sighted in the Bannerghatta Biological Park

Butterflies		
1	<i>Acraea terpsicore</i>	Tawny coaster*
2	<i>Ariadne ariadne</i>	Angled Castor
3	<u><i>Ariadne merione</i></u>	Common castor
4	<i>Atrophaneura (Pachliopta) hectare</i>	Crimson rose
5	<u><i>Atrophaneura aristolochiae</i></u>	Common rose
6	<i>Belenois aurota</i>	Pioneer*
7	<i>Catopsilia pomona</i>	Common Emigrant*
8	<i>Catopsilia pyranthe</i>	Mottled Emigrant*
9	<i>Cepora nerissa</i>	Common Gull*
10	<i>Danaus genutia</i>	Plain tiger
11	<i>Danaus genutia</i>	Striped Tiger
12	<i>Euploea core</i>	Common crow

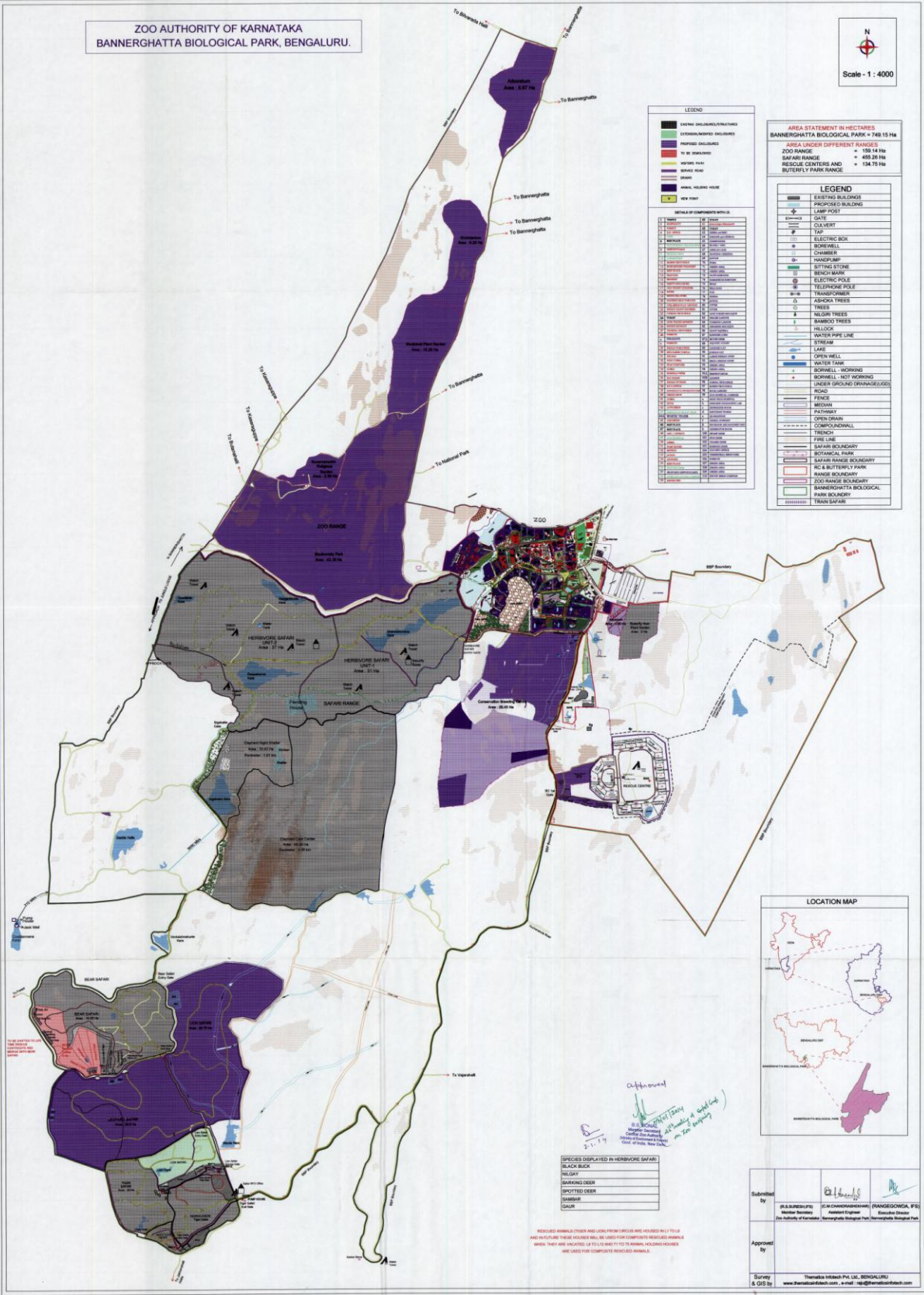
13	<i>Eurema spp</i>	Grass Yellow*
14	<i>Graphium doson</i>	Common jay*
22	<i>Graphium nomius</i>	Spot Sword Tail*
15	<i>Ixias marianne</i>	White orange tip*
16	<i>Ixias pyrene</i>	Yellow orange tip*
17	<i>Leptosia nina</i>	Psyche*
18	<u>Muntingia calabura</u>	Blue bottle*
19	<i>Papilio demoleus</i>	Lime Butterfly
20	<i>Papilio polytes</i>	Common mormon
21	<i>Phalanta phalantha</i>	Common leopard
23	<i>Talicauda nyseus</i>	Red Pierrot
24	<i>Tirumala limniace</i>	Blue tiger

Fishes: Varieties of fishes are available in rivers, rivulets and so also in the chains of water tanks located in the BBP.

Insects: Varieties of Butterflies, Bees, Ants, etc are seen here.

ZOO AUTHORITY OF KARNATAKA
BANNERGHATTA BIOLOGICAL PARK, BENGALURU.

N
Scale - 1 : 4000



LEGEND

EXISTING BUILDINGS/STRUCTURES
PROPOSED BUILDINGS/STRUCTURES
TO BE DEMOLISHED
ROADS
BRIDGE ROAD
RAILWAY/RAILWAY CROSSING
NEW ROAD

DETAILS OF COMPOUND WALLS

TYPE	DESCRIPTION
1	...
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AREA STATEMENT IN HECTARES
BANNERGHATTA BIOLOGICAL PARK = 749.15 Ha

AREA UNDER DIFFERENT RANGES
ZOO RANGE = 158.14 Ha
SAFARI RANGE = 455.29 Ha
RESCUE CENTRE AND BUTTERFLY PARK RANGE = 134.75 Ha

LEGEND

Symbol	Description
...	EXISTING BUILDINGS
...	PROPOSED BUILDINGS
...	LAMP POST
...	GATE
...	COLLECT
...	TAP
...	ELECTRIC BOX
...	BORWELL
...	CHAMBER
...	TRASH CAN
...	SITTING STONE
...	BENCH MARK
...	ELECTRIC POLE
...	TELEPHONE POLE
...	TRANSFORMER
...	ACACIA TREES
...	TREES
...	NILGIRI TREES
...	BAMBOO TREES
...	HULLOCK
...	WATER PIPE LINE
...	STREAM
...	LAKE
...	OPEN WELL
...	WATER TANK
...	BORWELL - WORKING
...	BORWELL - NOT WORKING
...	UNDER GROUND DRAINAGE/SEWER
...	ROAD
...	FENCE
...	METAN
...	FATHOMY
...	OPEN DRAIN
...	COMP/CONDHALL
...	TRENCH
...	FINN LINE
...	SAFARI BOUNDARY
...	BOZANICAL PARK
...	SAFARI RANGE BOUNDARY
...	RC & BUTTERFLY PARK
...	RANGE BOUNDARY
...	ZOO RANGE BOUNDARY
...	BANNERGHATTA BIOLOGICAL PARK BOUNDARY
...	TRAIN SAFARI



Approved
2-1-14
H.S. Bhat
Member Secretary
Zoo Authority of Karnataka
Bannerghatta Biological Park
Bengaluru

SPECIES DISPLAYED IN HERMISTON SAFARI

BLACK BUCK
HILGAY
SINGHUR DEER
SPOTTED DEER
GAMBAR
GAUR

REDUCED ANIMAL STOCK AND LEAVY FROM DECEASED AND HARBORING TIGRIS AND ANTI-PHASE THESE HOUSES ARE BE USED FOR COMPACTE REARDED ANIMALS WHEN THEY ARE HARBORED BY TIGRIS OR ARE TO BE HARBORED IN HOUSES ARE USED FOR COMPACTE REARDED ANIMALS

Submitted by
R.S. Bhat
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Zoo Authority of Karnataka

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Assistant Engineer
Executive Director
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