

KARNATAKA FOREST DEPARTMENT

MANAGEMENT PLAN FOR
DAROJI
SLOTH BEAR SANCTUARY

2011 – 12 to 2015 – 16



By
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Chapter 1

Daroji Sloth bear sanctuary

1.1 Introduction

The unique Sloth Bear Sanctuary is situated at 15 kms from the World Heritage site “Hampi” near Hospet. Geographically it is located between N 15°14' to 15°17' latitude and E 76°31' to 76°40' longitude with an average elevation of 647 MSL, temperature of 20° to 46° C & annual rainfall of 450 to 500 mm. It is a strewn hillock that stretches between Daroji of Sandur Taluk and Ramasagar of Hospet taluk in Bellary District.

In October 1994, the Government of Karnataka vide their notification Number Apaji-159-FWL-91, dated 17-10-1994 declared 5,587.30 hectares of Bilikallu Reserve Forest as Daroji Bear Sanctuary under section 27 (A) (h) of Karnataka Wildlife Act 1972. Later on in October, 2009 the Government of Karnataka by vide notification No.FEE-119.FW/2008-09, dated: 03-10-2009, declared an extent of 2685.50 hectares of “Bukkasagara Reserve Forest” as the part of Daroji Sloth Bear Sanctuary, under sub clause (b) of Section 26-A of Wildlife (Protection) Act, 1972. However at the time of declaration, the forest had nothing but barren stony hillocks and thorny trees, owing to the arduous efforts of the staff and support of the surrounding villagers, the sanctuary has transformed into a lush green area boasting of a Verdant forest with exuberant local species of flora and fauna. Total area of Daroji Bear Sanctuary is 8272.80 hectares (82.72 Sq Kms) consisting of Bilikallu East Reserve Forest and Bukkasagara Reserve Forest.

1.2 Approach

Approach by road is from Bangalore to Chitradurga (199 km), then to Hospet (135 km), and then to Kamalapura (12 km), which is 15 km from the

Sanctuary. It can be also approached from Ranebennur to Harihara (21 km) then to Hospet (132 km) then to Sanctuary. There is a train facility from Bangalore to Hospet via Guntakal.

1.3 Geology

The schistose formations (Dharwar series) occur in the form of prominent bands, striking across the district northwest to southeast direction. These are generally associated with volcanic flow, sills and other minor intrusions. Schistose rocks are the repositories of economically important ores and minerals and are encountered in these areas.

The declared Bear sanctuary area is having rocky outcrops, boulders, caves and crevices with gneiss and quartzite formations with sparse or no vegetation. The topography is well situated for bear habitat and is interspersed with hillocks and valleys.

1.4 Water sources

As the area receives scanty rainfall, supports only drought resistant and hardy species. It receives south-west monsoon with thunder showers starting from May- June and some times during October with moderately heavy showers in June, July and August. The location is close to Tungabhadra canal which runs in the middle (5 Km) and also along the periphery (15 Km) of the sanctuary but canal water not available to sanctuary owing to statutory regulations of the Tungabhadra dam board. There are number of nalas or halla in the sanctuary area, which are seasonal in nature usually dried up during summer. A number of tanks, check dams, pick up dam, gully checks were constructed in the past to provide drinking water to Bears during summer and to increase water level.

1.5 Climate

The rainfall is mostly confined to the period from June to November during the southwest monsoon. October and November are the months of the retreating monsoon. Sixty percent of the rainfall is received during from June to September and about 24% during October and November and the remaining 16% is un seasonal rain. September happens to be the month with the highest rainfall. On an average, the district has 39 rainy days in a year. The variations in the annual rainfall from year to year are large.

The general climate of the area is dry humidity with frequent droughts owing to scanty or no rainfall, resulting in lowering in water table and acute shortage of water especially during summer months. In order to provide water to sanctuary number of bore well have been drilled in the past but most of them have failed due to poor rainfall coupled with increase in mining activities in the region.

1.6 Flora

The forests of this area belong to Dry deciduous scrub (5DS1) and Southern thorn forests (6A/DS1) according to Champion and Seth classification. The floristic composition comprises of *Acacia catechu* (Cutch), *Acacia latronum* (Donnejali), *A. leucophloea* (Bilijali), *A. nilotica* (Karijali), *Aerura lanata* (Bilihinidi soppu), *Aerua lanata*, *Alangium lamarckii*, *Albizia amara* (Tuggali/chuggali), *Albizia odorotissima*, *Anogeissus latifolia*, *Calotrophis species*, *Canthium species*, *capparis zeylancia* (Anthundikai), *Capparia divaricate*, *capparis horrida*, *cardiospermum halicacabum*, *Carissa carandas* (Kavali), *cassia absus* (Kaduhuliga), *cassia fistula* (Kakke), *chloroxylom swietinia* (Mashiwal), *cocculus hirsustus* (Dhagadiballi), *cochlispermum religiosum* (Arshina boorige), *crotalaria species*, *Cryptolepis buchananii*, *Cuscuata reflexa*, *Diospyros paniculata*, *Eugenea jambolana*, *Evolvulus alsinoides*, *Ficus arnotiana* (Bettadarali), *Ficus bengalensis*, *Ficus glomerata*, *Ficus recemosa*, *Ficus tomentosa* (Kallati), *Gevatia rottle*, *Givotea rottleriformis*,

Grewia dominae (Ulpi), *Grewia suavelensis* (Jane), *Grewia telifolia*, *Holoptelia integrifolia*, *Indigofera tinctoria*, *Ipomea sp*, *Melia dubea*, *Morinda tinctoria*, *Morinda tomentosa*, *Pavetta indica*, *phoenix sylvestris*, *Pupallia lappacea*, *Randia uliginosa*, *Sapindus trifolia*, *Syzygium cumini*, *Tephrosia purpurea*, *Triumpheta sp*, *Witharia somnifera*, *Wrightia tinctoria*, *Zyziphus jujujba* (bare), *Zyziphus oocarpa* etc are found in the area.

1.7 Fauna

It is estimated that about 150 Sloth Bears are living in the sanctuary, apart from Leopards, Hyena, Jackals, Wild boars, porcupine, Pangolins, Star tortoise, Monitor lizard, Mongoose, Pea fowls, Partridges, Painted spur hen, Quails, etc., About 70 species of birds and 20 species of butterflies have been identified as mentioned in Table - 1 and 2

1.8. Major Conspicuous Changes in the Habitat since Inception

The major change in the habitat is that, the native vegetation inside the protected area has witnessed constant protection and hence resulting in the vegetation progressing towards their natural forest succession. The habitat was earlier prone to firewood collection and forest fire. This has changed due to the protection provided by the department. And natural regeneration of the forest is evident.

- Soil and Moisture conservation works inside the sanctuary has also enabled rapid vegetation growth.
- The landscape and consequently the habitat have been protected intact by preventing collection of sand and stones from sanctuary premises.

1.9 Mining activity in the region

The district is endowed with rich deposits of minerals of economic importance like iron and manganese. High grade haemostatic iron ore occurs cresting the

synclinal folds of the Dharwar bands, specially the “Sandur synclines” and are considered among the world’s richest deposits of iron ore, having 65 to 68% iron content.

1.10 Past history

Daroji Sloth Bear Sanctuary was the first Sloth Bear Sanctuary in Asia declared in 1994 because of continuous effort of Mr. Ghorpade, the then Minister of Karnataka State. Management plan for the period 2005-06 to 2009-10 was prepared and got approved from Principal Chief Conservator of Forests (Wildlife) vide office memorandum No.DMN/WL/CR-4/2006-07 date 24-02-2007. Lot of works under Habitat improvement and Eco-development were carried out during the past plan period. The details of the works carried out are shown in Table - 5.

1.11 Resource Dependence of Villages:

Agriculture is the predominant occupation for all the villagers around the sanctuary. Most of the agricultural land is rain fed and the reaping of bumper crop depends upon the good rainfall. Some of the villagers dug bore well to irrigate their land to grow cash crops like sunflower, maize, ground nut etc. Some lands of Villages like Daroji, Devalapura, Metri, Venkatapura etc get water from canal and grow paddy, sugar cane, banana etc.

Other occupations - pottery, animal husbandry, dairy, carpentry, daily wage earning in agriculture, industries, quarries is seen in these villages.

NREGA scheme is available in all the villages of EDCs and the people are getting enough employment. The Socio-economic profile of villages around the sanctuary is mentioned in Table - 3

1.12 Human -Animal conflict

There are 24 villages and more than 100 quarries were in the past, of which a few leased quarries are working at present. There are a few iron ore mines in the vicinity. Villagers usually collect firewood, grass and other NTFP from forest area but the menace of the stray cattle are more, and they will compete with wildlife w.r.t grass, water, fruit etc.

The disturbance from quarry activities and explosion in the mines are known to cause deleterious effect on wildlife population in terms of reproduction, habitat disturbance etc. Because of the persistent efforts by departmental staff, most of the quarries have been stopped.

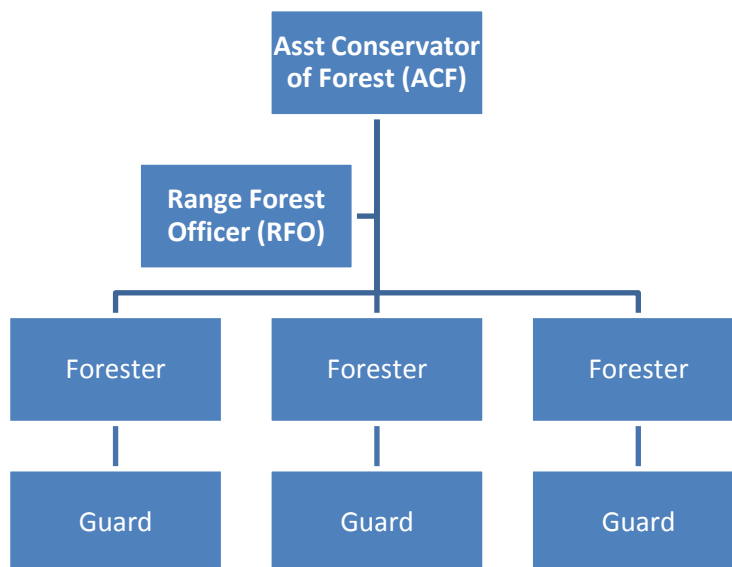
Semi nomadics having sheep usually visit this area once in a year causing very alarming damage due to huge crowd of sheep with concentrate grazing. Further, some local tribes like Bedas staying in and around sanctuary will come for ritual hunting during Ugadi festival. However, the ritual hunting has been stopped due to persistent effort by the department since 5 years.

Encroachment is not a problem owing to its compactness and non-availability of plain fertile land in the fringes of Sanctuary area. There were incidences where they have given information to smugglers/lifters regarding newborn cubs so they can easily locate this habitat and lift them for clandestine smuggling. At present no such type of activities in the region.

1.13 Administration

In the past it was under the jurisdiction of Ranebennur Wildlife subdivision headed by Assistant Conservator of Forests. In 2010 a new subdivision has been created exclusively for Daroji Sloth Bear sanctuary to make administration easier and better management especially for protection purposes vide G.O: Apaji:156:apase:2010-dated:30-09-2009.

1.14 Staff pattern



1.15 Infrastructure

The Sanctuary has an old jeep and a nature camp situated between Kamalapura and PK Halli having a guest house with two rooms, three tents and a dormitory of 12 member capacities. There is a Range Office and 3 Quarters (1 RFO, 1 Forester, 1 Guard). RFO quarters is converted into ACF Office.

1.16 Visiting hours

Visiting hours of the sanctuary is between 4.00 pm to 6.00 pm in the evening on all the days. To watch the Bears one must be in the watch tower on a hillock and sit quietly to look at the Bears descending from the opposite Karadikallu gudda. This hillock has hundreds of caves where the bears take shelter. For the travel enthusiasts, who nurture plans to visit this sanctuary, it is advisable to wear natural dark clothes and avoid white and light colored clothes. The best time to visit the sanctuary is between August to April.

The present tariff for entry into the sanctuary is mentioned in Table - 4

1.17 Accommodation

Forest guest house- Kamalapura, Gunda Forest guest house- Vyasanakere

HPC guest house- Kamalapura

PWD guest house- Kamalapura

KSTDC's Mayur Bhuvaneshwari- Kamalapura

Kailash TB board guest house-Hospet

In addition to above, a number of private lodges are available in the Hospet town owing to number of tourists visiting Hampi Heritage Center throughout the year both from India as well as abroad.

1.18 World heritage center, Hampi

HAMPI, the seat of the famed VIJAYANAGARA Empire was the capital of the largest empire in post-mogul India, covering Karnataka, Maharashtra and Andhra Pradesh states. The empire reigned supreme under Krishnadevaraya, the Emperor.

The empire later became famous for its support towards renovation/reconstruction of temples throughout India. It also became renowned for re-establishment of Indian culture, its support for music, art and literature. With the prime purpose of caring for the people and their welfare, this empire stretched physically covering Karnataka, Andhra and became a by-word for golden rule.

Strewn over a large area (about nine square miles) the ruins at Hampi offers to the tourist a remainder of the greatest land in the whole world. Every rock, every path and every monument at Hampi speak the same language; a language of glory and beauty.

In March 2002, the Government of India has announced that Hampi would be developed as an International Destination Centre. In April 2002, Karnataka officially set up the Hampi World Heritage Area Management Authority with wide-ranging powers, as well as a State Level Advisory Committee for integrated development and conservation of Hampi.

1.19 Other places of tourist attractions

- Tungabhadra dam
- Khishkinde private resort
- Mookambika water sports- Sandur
- Proposed Atal Bihari Vajpai Zoological Park

1.20 The Ecotourism

The concept of ecotourism is gaining importance in recent years. The love for nature and wildlife drives the people to visit green forests, Sanctuaries, National Parks etc. Before 1950, the brave and bold “hunters” the Maharaja of Mysore were camping in deep forests for hunting tigers, panthers etc. The same hunter and Maharaja become the saviors and conservationist of the forests and wildlife. The reason for this was the depletion of forest and extinction of wildlife. After depletion of National Park and sanctuaries, the general public was not allowed in these protected areas. The people crave for nature compiled by department to capitalize this, hence the concept of ecotourism aroused. Today ecotourism has become a big industry. Nature camps, tents, trekking paths are part of ecotourism which helps to improve the greenery and helps in protection and conservation of forests and wildlife.

1.20.1 Objectives of ecotourism

1. To preserve, develop and improve the existing Eco-tourist spot to meet the recreational and other educational needs of mainly local people along with other visitors.
2. To create awareness among people about nature conservation and its importance.
3. Development of ecotourism and conservation of nature for the benefit of local people.
4. To ensure sustainable use of land and natural resources by setting up participatory process of planning and management.
5. To bring awareness among people about watershed concept, nature, importance of soil and water conservation etc.
6. To provide recreation and innovative research.
7. To provide wilderness experiences to genuine enthusiasts in particular and to the public in general.

Chapter 2

About Sloth Bear

2.1 Introduction

The Sloth bear is a medium size bear weighing between 175 and 310 pounds with a body length between 60 and 75 inches. It has a very shaggy coat of black fur, with grey and brown hairs mixed in. On the chest there is a U shaped or Y shaped patch of white or cream colored fur. This same light color occurs around the muzzle and sometimes extends around the eyes. The snout is very mobile and the nostrils can be closed voluntarily. It is found in India, Bangladesh, Nepal, Bhutan and Sri Lanka.

There are eight species of Bears in the world. Indian Sloth Bear confined to India and Sri Lanka only. Its scientific name is *Melursus ursinus*. Fore limbs are longer than hind limbs; the hairless feet are armed with white, blunt, curved claws, which extend up to three inches. Hairless webs unite the pads of the fingertips. Though the head is comparatively large, the Sloth bear have relatively small ears and eyes. Hence their sense of hearing and vision is poor. But they have outstanding sense of smell.

Their short-haired, grayish colored muzzle is extremely flexible and ends in the nose. The nostrils can be closed at will. The lips are extremely loose and two incisor teeth are absent in the upper jaw. All these arrangement are helpful for sucking termites and ants. Normally, adults attain a length of about six feet and stand three feet at the shoulder. Male adults weigh about 140 kg and female adults about 75 kg. While summer is their mating period, this is often accompanied by a lot of quarrel and fighting between the males and the females. Usually two to three cubs will born in winter, the new born cubs are small, hairless and blind for three weeks. The mother rears the cubs for two to three years. The lifespan of Bears is 40 to 50 years. When threatened they

respond by standing on their hind legs and displaying their formidable fore claws. The other species of Bear in the world are Sun Bear, Black Bear, Brown Bear, Grizzly Bear, Polar bear, Spectacled Bear.

This species has been recognized as one of the most threatened with extinction by the IUCN- Bear Specialist Group and therefore the AZA Bear Advisory Group will place high priority on initiating efforts to develop an in situ conservation program. The total world population of the Sloth Bears is estimated at approximately 7,000 to 8,000 animals, which means that the IUCN lists as an endangered species (vulnerable).

2.2 Taxonomy

Sloth Bears belong to Class- Mammalia, Kingdom: Animalia, Phylum: Chordata, Subphylum: Vertebrata, Class: Mammalia, Subclass: Theria, Order-Carnivore, family- Ursidae, Genus-Melursus and species-ursinus. In Hindi it is called Bhalu and in Kannada- Karadi, Telugu- Elugu Bunti, Malayalam-Puni Karadi.

2.3 Evolution

The ancestors of all modern Bears including the Sloth Bears were evolved from a bear like dog that developed from the miacids (a small tree climbing carnivorous mammal living 30-40 million years ago). The first Bears lived in subtropical Europe about 20 million years ago. It was the size of a small dog then 2.5 million years ago the direct ancestors of the modern Bears appeared. The genus Ursus has divided into three evolutionary lines about 2 million years ago.

2.4 Habitat

The Sloth bears prefers grasslands and forested area at predominantly lower altitudes. It is more often found in drier forests and areas with rock outcroppings, caves, and crevices owing to its protection from shelter especially during hot summer and rainy season.

2.5 Food habits

They will come out shortly before sunset, hunt for food in the night and retire in the morning. They are mostly nocturnal, feeding and travelling in night and sleeping in the day unless they are disturbed or shortage of food or for want of their cubs, they are excellent tree climbers and are often seen hanging from a tree limb like a sloth, it is believed that they do not know to descend from tree, simply drop from the tree. Bears eat a variety of food like insects, fruits, plants, honey but they are relish on termites, ants and honey. A Bear rips open the termite mound with its stout claws, pokes its muzzle in the hole, and blows the dirt and debris away, then it enjoys the termites by sucking them just like a vacuum cleaner. Its diet is mostly comprised of termites for which this species is specially adapted. Its upper incisors are missing, forming a gap, and its lips can extend to form a tube. With this, the Sloth bear is able to suck up the termites, making a sound that can be heard from over 330 feet away. They are crazy over honey, they will climb trees to obtain honey and no attack from bees can drive away from the honey. The Bears also eat the fleshy flowers of Mahuva. They also raid agriculture crops like Sugarcane, Corn and Yams etc. Also they dig for the white grubs of large dung and longhorn Beetles which tunnel in the earth.

2.6 Distribution

The Sloth Bears are found in South - East Asia, primarily forested tracts of India from the base of the Himalayas to Ceylon, but they have also been reported from Bangladesh, Nepal, and Bhutan. They live in warm, humid forests or in grasslands near the equator. They can also live in a wide variety of forest type from dry thorn forests in the north to wet tropical forests in the south.

2.7 Body size

Height at shoulder from 2.2 feet to 2.9 feet (65 cm to 85 cm), average length 4 feet to 5-6 feet (140 to 170 cm). Males usually larger weighing about 289 to 320 pounds (127 to 145 kg) whereas females 140 pounds (65kg).

2.8 Reproduction

Mating occurs in May, June and July. Mating pairs come together for one or two days. During this time there is a considerable vocalizing and fighting occurs. Gestation period lasts for six to seven months, then cubs will born in one or two numbers, the cubs stay with their mother until they are nearly adult most probably two to three years of age.

There is a little recorded about vocal communication amongst Bears. They growl and grunt at each other, give vent to various puffing, bubbling, and whining sounds when seeking their food, and raise an appalling clamor when wounded. It is however recorded that, the Sloth Bear gives out a long-drawn melodious note which is described as a mate call; a pair was observed so calling to each other. Sloth Bear are particularly noisy at mating time, mother Bears call to their young, except when mating or accompanied by their young, Bears usually lead solitary lives. Sloth bears are the only bears that carry their young on their back.

2.9 Historical background

India was known as Jambudweepa because Jambavanatha the mythological personification of Bear is reported to have inspired Lord Hanuman to fly across the sea into Srilanka. The origin of this episode is the Hampi environs. A series of names and designations have been coined and fashioned like Jambunatheshwara temple built in 15th century. Other names such as Karadidurga, karadipura, Karadihall, Karadibetta, Jambagi, Jamakhandi, Bhalluki etc.

2.10 Ritual hunting in Bellary district

In Bellary district of Karnataka state, Kamalapura is a small town with seven hamlets (colonies) of Beda tribes, is 12 kms away from Hospet town. According to 2001 census the population of Beda community is 21,830. They will celebrate Ugadi festival in three days. On first day, leaders of the community from all the seven hamlets meet at a place and plan for ritual hunting celebration. They get the permission from descendants of Anegundi Kings and decision of the meeting will be notified in all seven hamlets by a person.

On second day they worship their ancestors with offerings of their likings and on third day men from seven hamlets go for hunting with their weapons to jungle. After returning from hunting, flesh will be consumed after offering to God as a ritual. For the last five years, this celebration of ritual hunting is controlled with cooperation of district administration.

The wildlife may be wild boar, Fox, Hare, Wild cat and even Birds. Before independence all the villagers used to involve in ritual hunting, later on this practice prevailed in Beda community only. In recent time's lot of efforts have undertaken to prevent this ritual festival especially in the sanctuary area but sometimes goes without notice in other areas.



Ritual Hunting

2.11 Bear dancers of Karnataka

Bear dancers are mainly concentrated in Koppal and Belgaum districts where Bears are easily available in the forest. All most all Bear dancers are converted Muslims, they will go to Mosque and have sects like Saikh, Saiyad, Pathan etc. But in core culture they follow tribal animism like semi-nomadism and depend on rural beggary. They move for months together along with their family and dancing Bears to Andhra Pradesh, Maharashtra, Kerala and Tamil Nadu states.

They are illiterate people and depending on this dancing bears for their livelihood, but in recent times due to the strict vigilance by both forest and police personal to curb this animism, these people are protesting against forest as well as police officers. Some of them already left this profession and started other occupation like agriculture, small petty business and so on but there are some families still continuing this profession. Hence, they could be properly educated and rehabilitated to get rid of this ritual profession.

In India many Sloth Bears are taken from mothers when they are just weeks old and have to witness their mothers brutally killed while trying to save their cubs. These cubs are then sold on the black market where the buyers turn them into “Dancing Bears”. To do that, their muzzles are pierced and threaded with a coarse rope. They are training starts on hot coals with sticks hitting their feet to make them “dance”. The bear lives out her life at the end of the rope. He dances for tourists and is dragged from village to village.

According to Wildlife (Protection) Act 1972, dancing of Bear and domestication is prohibited and against the rule and moreover punishable with imprisonment, but bears caught from them left in the forest do not survive as they domesticated and nurtured artificially. At present the practice of Bear dancing is totally banned. Hence, incidences of clandestine removal of cubs and killing of young one’s are less in recent days.

Chapter 3

Proposed management plan

3.1 objectives

The following objectives of management are envisaged keeping the guidelines of the Wildlife (Protection) Act 1972 and the National Wildlife Action Plan as below:

1. To ensure protection of Sloth bear Sanctuary from poaching, habitat destruction and Fire through effective protection strategies.
2. To manage the habitat towards maintaining viable population of bears.
3. To ensure the prevention of hunting, ritual hunting of wildlife by involving local community, EDC members and NGOs.
4. To ensure ecologically compatible land uses in the areas adjoining the reserve.
5. To minimize the conflicts of interests between the sanctuary management and villagers through effective eco-development programs.
6. To develop research interest and expertise in local institutions around the PA so that information needs of the PA are met locally.
7. To evolve a system of training for capacity building of field staff towards handling challenges of wildlife protection and management.
8. To take up or support research activities of flora and fauna in and around the sanctuary.
9. Conservation of endangered animal “Sloth Bear” found only few in the country.
10. To educate people, students and visitors about Bears and ecosystem.
11. To gain confidence of local village people and involving them in conservation and protection of endangered species.
12. Involvement researchers, scholars in educating people and conducting research on various aspects of this unique ecosystem.

13. Identification of genuine non-government organization who are really involved in conservation and protection of wildlife.
14. To make a circuit tourist spot by linking with Hampi heritage center, Tungabhadra dam and so on.
15. Survey and documentation of Great Indian Bustard (GIB) present in the region and conservation of Great Indian Bustard.

In order to achieve above objectives the following measures / works could be taken up:

3.2 Protection from Forest Fire, Grazing and Illicit cutting of existing vegetation

First and foremost duty of any conservationist is to protect the area from forest fire, grazing and illicit cutting. Villagers of this region are having herds of cattle, sheep and Goats as a subsidiary occupation, because they need not to invest any amount for its maintenance. They let them to forest area for grazing. Most of the cattle are infertile cows and buffaloes, but still it will be maintained for cow dung purpose only. The same thing holds good for sheep and Goats also, but goat causes more damage than that of sheep. Even though animal husbandry is not economically viable and not managed scientifically, still it acts as insurance during ceremonies and ritual functions etc. Hence it is very difficult to convince local villagers for stall feeding, hybrid milking cows and so on, and further their economic conditions are also very poor, most of them are depending on rain fed agriculture hence they are busy for few months then totally free without any work. However, attempt can be made to motivate to follow stall feeding and rearing of hybrid cows for profit.

In addition to above annual maintenance of existing roads construction of cause ways and culverts, excavation and repair of existing Cattle Proof Trench (CPT), stonewall. Barricade can be made wherever regular path near to the villages to prevent entry of stray cattle into the Sanctuary area. Even though Sanctuary do not possess good tree

growth still people cut existing tree growth for fuel wood, fodder and agriculture implements etc. The forest is protected from fire by taking up fire protection measures such as maintenance of fire lines, engaging fire protection watchers and with the co-operation of the public during summer season.



Cause Way



Culvert



Maintenance of Road

3.3 Soil and Moisture Conservation measures

It is the only best solution for the drier districts of Karnataka to overcome drought conditions and to increase water table level. Poor water management policies and reckless use of water are making the conditions more pathetic as time elapses. In some of the districts, water table goes 1000 to 1500 feet below, such being the case, days are not far from condition where there will be no water for even drinking purpose. Hence it is high time to conserve this valuable natural resource by harvesting the rain water by means of creating barricade against the flowing water so as to increase infiltration rate and water table level.

This area receives scanty rainfall (on an average 530 mm) and number of rainy days are only 39, hence it is very essential to harvest this rain water efficiently by constructing Soil and Moisture Conservation (SMC) structures like Check dams, Nala bunds, Earthen and Boulder Gully checks, Percolation ponds, Staggered Contour Trenches (SCT), Earthen water hole and so on. In the past, number of these structures have been constructed in the sanctuary area, but still more number of structures are needed and some of them need to be rejuvenated by desiltation and repair wherever necessary. The staggered

trenches shall be carried out on sloppy ground to harvest the rain water followed by seed sowing on mounds of such staggered trenches.

By storing the water in these structures known to have profound effect on adjacent vegetation and old moribund root stock of various species automatically get rejuvenated. Wildlife and birds will get water within the sanctuary area so that they need not go outside the sanctuary in search of water, and cause damage to agricultural crops and sometimes injuries to the people.



Check Dam at Kamalapura Block



Earthen Gully Check



Farm Pond



Desilting of Tank at Dharmasagara Kere

3.4 Afforestation programs

The sanctuary area which is abode with huge boulders, rocky outcrop, caves and crevices well suited for the Bear habitat but tree growth is very poor, only hardy, and drought resistant species found to exist. Of which, majority are shrubs and thorny in nature. Hence, it is very much essential to plant local, hardy, drought tolerant fruit yielding species so that wildlife can also compatible with those species, especially bear in specific and other birds and other animals in general. While planting, care should be taken to plant tall seedling in an open area with top soil so as to avoid damage from cattle and sheep so that better results could be obtained.

Profuse seed sowing of Seethapal, Zyzypus, Sandal and other species on CPT catch pits, inside bushes, crevices and on staggered contour trenches shall be done to enrich natural flora.

Bears known to feed on some of the tree species, such species can be planted in vulnerable areas adjacent to SMC structures, along nalas etc., so that bear will get food easily and they will not move out of the Sanctuary in search of food.

Planting technique should be locally suitable and harvest maximum water during rainy days. Pits of size 1.00 cum and staggered contour trenches of size 1.00m X 0.5m X 0.5m may be carried out well in advance and followed by planting in next subsequent year with tall fruit yielding species.

3.5 Community Oriented Program / Eco - Development Committees (EDC)

Involvement of local people is most important criteria for the success of any Govt. program especially forestry program since it involves management of natural resources in an open ground. In rural areas, economic conditions are very poor, hand to mouth and more over, most of them are illiterates. Basically we should understand the culture, basic requirement, life style, food habits etc. Accordingly plan should be prepared so that it can socially acceptable, ecologically and economically viable. They should be brought to the main stream by involving in conservation, protection and management of natural resources.

There are already 20 EDC's in and around the sanctuary area and some more can be formed wherever it is required and involve them in protection and management like identification of sites for SMC structures, afforestation /planting programs, engaging them as fire watcher and literate persons can be taken as guide so that they will get employment and belongingness will be developed besides upliftment of their economic condition.

By involving other Govt. departments like Education, Social Welfare, Health, Agriculture etc. an integrated program can be developed, so that ,they will get all facilities under single umbrella. Once their education and economic conditions improves, naturally they will think of conservation, protection and so on, otherwise hungry man cannot think of conservation of natural resources.

As a part of the above said prescriptions, the distribution of LPG stoves, smokeless chulas and distribution of grafted seedlings, providing drinking water by drilling bore wells, providing solar street lights, formation of farm ponds in farmers land, vaccination to villagers cattle and providing revolving fund for IGA activities for Self Help Groups (SHG) are being carried out. The above activities could be continued in addition to creation of awareness among people to reduce the pressure on natural resources in the locality.



Distribution of LPG Stoves



Providing drinking water by drilling bore wells



Animal Vaccination Program



VFC

3.6 Nature Camp

At present a nature camp situated between Kamalapura and PK Halli is having a guest house with two rooms, three tents and a dormitory of 12 member capacity. It needs to be modernized by establishing an interpretation center.

3.6.1 Development of Interpretation center

Interpretation center is a place where one can get more information on particular subject within a short span of time. Sometimes visitors won't find time to visit all places and gather required information, in such cases information center provides all information in detail including entry, tariff and facilities available, Salient features of sanctuary, Biology and life style of bear, Statistics of bear population and so on are made available in the information center. It can also be equipped with brochures, maps and other reading materials for the

visitors. Photos of different wildlife, chart depicting life cycle, food requirement, stuffed animals, sounds of different birds and animals can also be depicted. It is very useful for the researchers, students, scholars and foreigners. Retired Biology teacher can be engaged for looking after this center on honorarium basis or as a volunteer. Procurement of LCD Projector, Computer, Projector Screen, Note Books and other accessories is needed.

3.7 Production of documentary film on Daroji Bear Sanctuary

It is essential for documentation of an entire sanctuary including habitat, lifecycle of bears etc., hence a separate provision has been made in the project for documentation and uploading the same in the website for public awareness and to attract the tourists.

3.8 Tie up with Tourism and other Department for circuit tourism

This region is abode with rich heritage and scenic beauty places like Hampi World Heritage Center, Tungabhadra dam, Kishkinde water resort, Mookambika water resort and so on. Recently Central Zoo Authority of India has also approved for establishment of Zoological Park near Kamalapura which is nearer to Daroji Bear Sanctuary. Hence, circuit tourist program can be arranged by tie up with other Departments so that, visitors can visit all places as a package program within stipulated time. There are number of hotels and lodges of different category are available in Hospet, Kamalapura, Bellary, Torangal and other places where visitors who are residing in these hotels and lodges may not have the knowledge about the existence of Bear Sanctuary. Hence, they will visit only Hampi and return back. Therefore, wide publicity may be given in all places including hotels, lodges, educational institutions and also brochures made available to them free of cost.

3.9 Providing water facilities to park and to visitors

Water is the most important commodity for every living thing. In spite of several attempts for providing water to the sanctuary by means of bore wells and so on, still center facing acute shortage of water especially in summer months. Some of the drilled bore wells dried up owing to prolong drought and depletion in water table, therefore an attempt can be made at higher level to get water from existing Tungabhadra canal as a permanent remedy. Further, earthen storage tanks can be made on lower terrain to harvest rain water and made available during summer months. Water recharge pits shall be done for the existing bore wells to increase water table by consulting water recharge specialists. It is proposed to improve the water facility by replacing the existing damaged water pipe lines in the nature camp.

3.10 Staff Deployment

As this is a newly created sub-division, there is an urgent need to post the ministerial staff of one superintendent, one FDA and one office attendant. The transfer and posting of foresters, guards and the ministerial staff is done by Conservator of Forests who is also the authority for territorial divisions. Thus, there needs to be a rationale followed in posting the staff to wild life wing as it is a specialized wing which requires technically competent, interested, trained and physically fit staff. There is an urgent need to fill up the vacancies especially at the guard level. Apart from these regular posts, for effective protection strategy, local people will be engaged in anti poaching activities, patrolling squads and tourism management.

3.11 Incentives to staff

In order to encourage front line staff and build moral courage, the staff could be provided with -

- Uniform

- Medical facility
- Facility for education of their children
- Housing facility for family at nearest town
- Providing two wheelers to the field staff

3.12 Existing and proposed infrastructure

For efficient management of any project or task, basic facilities like availability of quarters, education facilities etc. are most important for executive staff for efficient management and protection. Without providing basic amenities it is not possible to expect better result / turn out efficiency. Hence, construction of staff quarters has been included in the plan period.

There is one ACF office, one RFO office and two staff quarters are there in Kamalapura. The sanctuary is provided with one jeep and it is proposed to procure one safari van. It is proposed to construct two twin staff quarters at Metri and Gadiganuru villages.

3.13 Formation of trekking path

It is proposed to develop a good network of all season trekking path inside the sanctuary and nature camp area for the benefit of visiting public. Visitors can trek through ups and downs to see and enjoy the beauty all around and wild animals in their natural habitat. The care should be taken in such a way that, it should not disturb wildlife.

3.14 Construction of watch towers

It is proposed to construct four watch towers, 2 small and 2 big each, so that one can see panoramic view of sanctuary and it also serves as a fire watch tower in summer months. The locations of these are usually on the ridge of the hillocks so that trekkers or visitors can sit a while and relax.



Watch Tower

3.15 Jambhava watch tower with telescope

The existing tower may be upgraded with all precautionary safety measures so that visitors feel secured and comfortable. Generally, Bears will be seen in Karadigudda in the evening hours. In order to see this view people will come to this watch tower and observe the varieties of wildlife including Bears, Wildboar, Mongoose and other animals & birds. But some time visitors will not see these animals due to farness hence locality may be provided with Telescope, big LCD screen so that all people including children can see wildlife comfortably without any disappointment. This watch tower can be named as Jambhava watch towers.

3.16 Preparation of Map using GPS

GPS is a satellite based technology being used in navigation, survey, census etc, accordingly sanctuary area may be surveyed using GPS and its co-ordinates may be recorded on all corners of the sanctuary permanently and same can be used for cross reference while trekking, census, afforestation etc. In near future GIS

technology can be used integrating with GPS for efficient management of the sanctuary.

3.17 Maintenance of temporary Rescue Center

Temporary Rescue Center has been established in the nature camp. It needs annual maintenance and up gradation.

3.18 Compensation to injured persons and crop loss

Whenever there is a crop loss or injury by wildlife to farmers, arrangement for payment of compensation could be made. However it is proposed to raise fodder plots in order to minimize the crop damage by sloth bears in the farmers lands.

3.19 Maintenance of sweet licks

Sloth bears are highly nocturnal animals and are fond of sweets and fruits. Therefore Joggery, honey and seasonal fruits are being put in some strategic points to attract sloth bears. This helps the tourists to see the sloth bears in the evenings, thus helping eco tourism.

3.20 Bear population estimation and monitoring framework

Before planning and evaluation of any project it is essential to have a population dynamics of any given wildlife. Hence, estimation of bear population could be taken up by using different techniques.

3.21 Training

Various trainings and awareness programs will be conducted for the members of Eco Development Committees periodically.

i. School program

During wildlife week, the students and teachers from the villages around the sanctuary were invited to attend the wildlife week programs, competitions etc. Periodical exposure visits to the sanctuary will be conducted for the students and teachers of the villages around the sanctuary to make them understand the ecological importance of the sanctuary.

ii. Awareness program

Awareness programmes will be conducted for the villagers around the sanctuary by experts during wildlife week and ritual hunting season through lectures, film show and street plays. Pamphlets and posters were also distributed about the respective subjects.



Wildlife Week Celebration

3.22 Zone Plans

The important zones that are proposed in the core area of the reserve are as below:

i. Bio-diversity conservation zone / Wilderness Zone

Bukhsagara and Daroji blocks of the sanctuary would be earmarked as biodiversity conservation zones since their vegetation and habitat is comparatively healthier and there is no tourism activity compared to other blocks. Hence, they can be reserved to biodiversity conservation and suitable measures can be taken.

ii. Habitat improvement zone

Since the sanctuary has scope for native habitat improvement in all the blocks, broadcasting of seeds of native forest species would be taken up in all the blocks. It is proposed to create a 200 hectare plantation (40 hectare and 160 hectares in PK Halli and Bukhsagara block respectively) to improve the habitat. Also, the corridor areas of Uparahalli - Dharmasagara and Devalapura - Kurekappa would also be taken up for habitat improvement to consolidate the fragmented forest cover.

iii. Eco-Tourism zone

Kamalapura block, which is the only block where tourism activity is permitted would continue as an eco-tourism zone. Apart from the watch tower, the trekking trails marked inside the sanctuary would be used for promoting eco-tourism.

At present the visitors are allowed to climb up the hillock and sit in the watch tower to watch the bears. But it is very difficult for the middle aged and aged persons to climb the hillock. More over allowing people to sit in the watch tower without any time limit is not advisable. All private vehicles are allowed inside the sanctuary without monitoring their movement. Therefore it is

planned to not to allow private vehicles inside the sanctuary and all the visitors should go in the departmental vehicle. They can see the bears from the van by staying about 50 meters away from the feeding ground for half an hour and can return back. It is proposed to have one Solar Battery Operated vehicle to take the visitors from the parking area near watch tower to the nearest view point.

There is a great pressure of wildlife photographers for photographing the bears from close quarters. Such persons should be allowed to the nearest feeding area for Rs. 5,000/- per person for still photography.

3.23 Theme Plans

The following theme plans will be developed for sanctuary management.

i. Protection from poaching and smuggling

It is proposed to establish two permanent anti poaching camps with four protection watchers each one at the eastern side and the other at the western side of the sanctuary. In addition to the above, it is proposed to engage protection watchers throughout the year and establishing temporary anti poaching camps during Ugadi ritual hunting period.

ii. Research, Monitoring and Training

a. Research activities to be taken up during the plan period: There is an enormous scope for research to be conducted on various aspects like spatial distribution of Bears, population dynamics, seasonal migration, animal health & diseases, food habit, reason for crop riding, encounters and injuries to mankind and compatibility with other wildlife.

b. Research Priorities: There should be a provision for the research on the population and distribution of the flora and fauna in and around sanctuary.

- c. **Research Projects:** Apart from the research on flora and fauna of the sanctuary, it is planned to take up the research in extensive areas also. One such research is on Great Indian Bustard in Hyderabad - Karnataka region. The wildlife subdivision can oversee the research projects through the competent agency. The priority of research and documentation should be given to the local NGOs with good background.
- d. **Great Indian Bustard:** The Great Indian Bustard (*Ardeotis nigricaps*) endemic to the Indian sub-continent is now on the brink of extinction and listed as critically endangered species by IUCN. The Great Indian Bustard is not only locally extinct and also from almost 95% of its former range. It has also disappeared even from the three wildlife sanctuaries declared 25 years ago for its protection. In North Karnataka a dedicated wildlife Sanctuary at Ranebennur which was notified keeping the conservation of the Great Indian Bustard in mind now has no sight records for the last 10 years.

The first sighting of 4 Great Indian Bustard in a group in April - May 2006 at Sirguppa taluk in Bellary district. It is interesting that, in both the Sirguppa and Koppal - Yelburga ecosystem Black bucks are sharing the habitat of GIB. These two are the co existing species. Black cotton soil is common in both the habitats. All the land belongs to the private land holders. There is no forest land in both the regions.

Purpose / Objectives of the GIB project

- Habitat mapping in and around Daroji bear sanctuary in Bellary and Koppal district for identifying the possible habitat of the endangered Great Indian Bustard (GIB)
- Survey and data collection by questionnaires and direct sightings by recording GPS coordinates.
- Developing the conservation strategies for GIB

3.24 Signage and Publicity

The Daroji Bear Sanctuary should carry a unique logo on every signage and publicity boards. There are not many publications on Daroji Bear Sanctuary. Efforts should be made to bring out various publications on the flora and fauna of Daroji Bear Sanctuary.

Every year wildlife week celebration could be used as a platform for sensitizing the local population and also schools about the daroji bear sanctuary and its inhabitants. Annual Hampi Utsava is the best occasion to give wide publicity about the daroji bear sanctuary.

3.25 Financial outlay

To carryout prescriptions mentioned under management plan, a financial outlay for Rs. 764.13 Lakhs has been prepared for the present period of 2011 - 12 to 2015 - 16 (Annexure - I)

The other details of works to be carried out have been mentioned in Annexure - II to Annexure - VIII