MANAGEMENT PLAN OF ANAMUDI SHOLA NATIONAL PARK 2020-21 TO 2029-30

Prepared by

LEKSHMI. R
WILDLIFE WARDEN, MUNNAR

Under the guidance of

ANOOP. K. R. IFS
CCF & FIELD DIRECTOR
(PROJECT TIGER), KOTTAYAM

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PREFACE

Anamudi Shola National Park is an area with unique Shola vegetation, and the forest type is Tropical Montane Cloud Forests (TMCF). This unique ecosystem has distinct ecological characteristics and a unique micro climate. The elevation level of the Park ranges between 1700-2500 m and this high altitude influence the climate of the region. Tropical Montane Forests represent some of the most threatened ecosystem globally. The Park is a natural habitat of a large number of plants and animals unique to the high altitude Shola grassland vegetation. *Cyathea crinita* (Tree Fern) is a highly restricted endemic species occurring in the rarest conditions. Habitat of this species are severely fragmented and therefore it is listed as Endangered as per the IUCN Red List. Mannavan Shola of Anamudi Shola National Park is one among the 15 locations from where the species is identified. A good population of *Cyathea crinita* is present in Anamudi Shola National Park and it is considered as the "**flag ship species"** of the Park.

The forest area of Anamudi Shola National Park consisting of Mannavan Shola Reserve Forests No.58, Pullaradi Shola Reserve Forest No.57 and Idivara Shola Reserve Forest No.56, were part of erstwhile Travancore Kingdom before the advent of the British rule. Anamudi Shola area was notified as Reserved Forest under Section 18 of Regulation II of 1068 on 22nd October 1901, and published in the Travancore Gazette. Being Shola forests, these areas were managed under the protection-working circle for the purpose of conservation of water sources. During 80s and 90s most of the lands in the valley were purchased or occupied by outsiders and large-scale planting of eucalyptus and other plantations started. Identifying the ecological importance of this area, it was declared as National Park vide the **Notification No.12876/F2 2003/F & WLD dated 14.12.2003** of the Kerala Government.

The eco-restoration initiative in Pazhathottam areas of ASNP is one of a kind in the Kerala Forest Department. During this plan period approximately 30% of the plantation area will be eco-restored and converted to Core zone. The eco-restoration of the Park focuses mainly on the eradication of black wattle and eucalyptus plantations. The Plan providedes a systematic approach in eco-restoration of shola grassland ecosystem by involving newly formed Harithavasantham eco-development committee.

Various workshops involving forest officials, scientists, professionals and local people were conducted for the preparation of this plan. It is prepared as per the guidelines of the Ministry of Environment and Forests and approved by the Chief Wildlife Warden of the State. All the further management activities would be carried out only as per the prescription of this approved Management Plan.

Lekshmi. R
Wildlife Warden
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ACKNOWLEDGEMENTS

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Last but not least, I am grateful to my team, **Sri. Sameer M. K**. Assistant Wildlife Warden, Shola National Parks, **Sri. Salish J. Menachery**, Wildlife Assistant, Eravikulam National Park, **Sri. Bhavadas Sarman**, Biologist, Munnar Wildlife Division. **Sri. Joby Antony**, Accountant, AFDA, **Cinimole. K.K**, Selection Grade Typist, for their active involvement throughout the process of preparation of the Management Plan. I am also thankful to my friends **Sharon Vergis** and **Indu K. R.** For helping me in the various stage of this Management Plan preparation.

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PART I

THE PROTECTED AERA
THE EXISTING SITUATION

CHAPTER 1

Introduction of the area

1.1 NAME, LOCATION, CONSTITUTION AND EXTENT

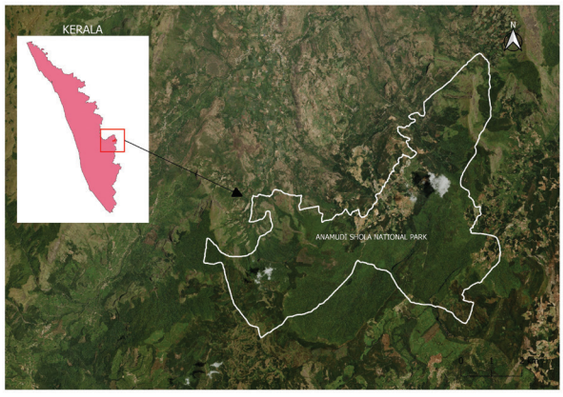
1.1.1 NAME

The name of the Protected Aera is Anamudi Shola National Park (ASNP). This is the second Management Plan of Anamudi Shola National Park, for the period from 2020-21 to 2029-30. The first Management Plan was for the period from 2010-11 to 2019-20.

1.1.2 LOCATION

Anamudi Shola National Park is located on the North-Eastern part of the High Ranges of Southern Western Ghats between N 10° 09' to N 10° 14' and E 77° 09' to E 77° 14'. Administratively, ASNP comes under Devikulam Taluk of Idukki district, Kerala State. Location map is shown in **Figure 1.1**

Figure 1.1: Location Map of Anamudi Shola National Park



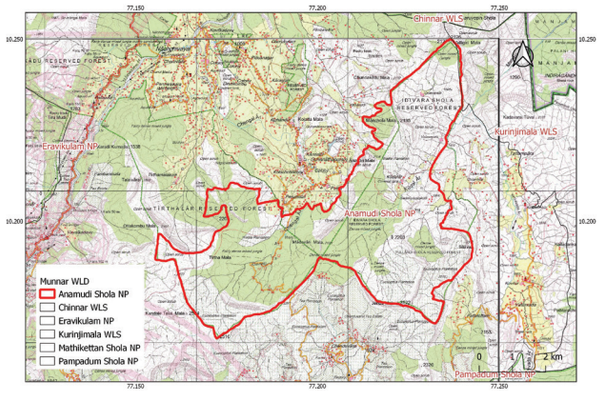
1.1.3 CONSTITUTION

ASNP was declared as National Park vide the **Notification No.12876/F2 2003/F & WLD dated 14.12.2003 of the Kerala Government** (Annexure 1.1). The ASNP consist of three Reserve Forests namely Mannavan Shola Reserve No.58. Pullaradi Shola Reserve No.57. and Idivara Shola Reserve No.56. which were notified on 22nd October 1901 under section 18 of Regulations 11 of 1068 of the Travancore Kingdom. In the Working Plan of the Malayattoor Division for the period 1951-52 to 1966-67, it was stated that **1) Mannavan Shola** - Though the area as per the notification is 2 Sq. Miles (1280 acres) the area indicated on the concerned map exceeds 3100 acres and that maintained on the ground roughly corresponds to the area indicated on the map. **2) Idivara Shola** - Though the area as per the notification is 150 acres, the area indicated on the concerned map exceeds 3000 acres and that maintained on the ground roughly corresponds to the area indicated on the map and **3) Pullaradi Shola** - Though the area as per the notification is 400 acres, the area indicated on the concerned map exceeds 3000 acres and that maintained on the ground roughly corresponds to the area indicated on the map. It was prescribed in Page 72 of Working Plan to take early steps to survey and notify the Shola Reserves.

1.1.4 EXTENT

As per the **Notification No.12876/F2/2003/F & WLD dated 14.12.2003 of the Kerala Government the extent of ASNP is 750 ha** (approx.). The extent within the notified boundaries was measured and verified by the GIS unit working under FMIS and it comes to 32.85 Km^2. **(Figure 1.2)** Action has already been initiated for the erratum notification after resolving the discrepancy in the actual area and notified extent.

Figure 1.2: Map of Anamudi Shola National Park



1.2 APPROACH AND ACCESS

Anamudi Shola National Park is situated around 35 km away from Munnar town and 19 km away from Marayoor Town. A forest road connecting Kanthalloor - Sethuparvathipuram (S.P. Puram) traverses

through Mannavan Shola for a distance of about 6 km, but now no public transportation is allowed through the above road. The road is used for protection and patrolling purpose only. Two coupe roads namely, Methappu - Valsapettykudi (9 km) and Koodallarkudi - Koviloor (4.5 km) provide access to the tribal hamlets inside. The nearest railway station in Kerala is Aluva (108 km) and in Tamil Nadu is Pollachi (114 km). The nearest Airports are the Cochin International Airport (107 km) and Coimbatore International Airport (156 km).

1.3 STATEMENT OF SIGNIFICANCE

Anamudi Shola National Park is an area with unique Shola vegetation and the forest type is Tropical Montane Cloud Forests (TMCF). This unique ecosystem has distinct ecological characteristics and a unique micro climate. The elevation level of the Park ranges between 1700-2500 m and this high altitude influence the climate of the region. High elevation has cut off the Park from the adjoining landscapes and it has resulted in high level of endemism. The region has distinct flora and fauna and serves as a field laboratory for conservation education, research and monitoring and participatory management.

I) BIODIVERSITY VALUES

Anamudi Shola National Park is characterized by the presence of high diversity of flora and fauna. Plant exploration studies identified a total of 389 plant species belonging to Pteridophytes and Angiosperms from the study area (Angiosperms–373 and Ferns–16). Angiosperms including 87 families and 227 genera were recorded from the area. Of these, nearly 186 taxa are 'endemic'. Out of the threatened category of plants, 4 are Critically Endangered, 14 are Endangered and 24 are Vulnerable as per the IUCN Red List. *Impatiens elegans, Vernonia heynei, Myriactis wightii* and *Ilex gardneriana* are the Critically Endangered species recorded from the Park. The Park also harbours many species of Orchids, Balsams and Strobilanthes.

The faunal diversity of the Park comprises of 31 species of Mammals (except rodents, shrews and moles), 123 species of Birds, 18 species of Reptiles, 19 species of Amphibians, 124 species of Butterflies, 19 species of Odonates and 8 species of Ants.

Cyathea crinita (Tree Fern) is a highly restricted endemic species occurring in the rarest conditions. It grows under shaded or open streams and stream sides in evergreen and Shola forests (forested and shaded areas with high altitude streams) between 1,500 and 2,200 MSL and found in the Western Ghats and wet elevated zones in Sri Lanka. Habitat of this species are severely fragmented and therefore it is listed as Endangered as per the IUCN Red List. Mannavan Shola of Anamudi Shola National Park is one among the 15 locations from where the species is identified (Nair et al. 1992, Kumar 1998, Kumar et al. 1998). A good population of *Cyathea crinita* is present in Anamudi Shola National Park and hence *Cyathea crinita* is identified as the **"flag ship species"** and is shown in **Figure1.3.**

Figure 1.3: Photograph of *Cyathea crinita*

II) Economic value

The economic value of the Park is largely due to the presence of abundant natural resources and the microclimate. The water sources and the climate prevailing in the area are conducive for cultivation of winter vegetables and fruits. The Park is the main source of water for the local communities. Majority of indigenous and local communities in fringe areas

depend on the Park for their livelihood. The Park is the catchment area of Mattupetti dam and Amaravathi dam. State of Kerala depends on Mattupetti dam for electricity and irrigation while Tamil Nadu depends on Amaravathi dam mainly for irrigation and for electricity. Both the dams generate huge revenue for each state. The Park also helps to generate revenue to the Kerala state, particularly from tourism. Increasing trend to tap the tourism potential is evident from the mushrooming up of tourism based infrastructure in the fringe areas.

III) AESTHETIC VALUES

The Park is a popular tourism destination due to its pleasant climate, scenic beauty and visual splendour. The panoramic view of Anchunadu valley from Methappu is mesmerizing. The lush green forest of Mannavan Shola and its unique microclimate is mind blowing for the tourists visiting the Park.

IV) SCIENTIFIC VALUES

Tropical Montane Forests represent some of the most threatened ecosystem globally. Shola is characterized by the presence of persistent cloud cover. The Park is a natural habitat of a large number of plants and animals unique to the high altitude Shola-grassland vegetation. The Park also has unique features and provides ample academic opportunities for studying the biodiversity of Montane vegetation and the ecological roles associated with the ecosystem. A high altitude grassland eco-restoration was initiated at Pazhathottam of ASNP which is one of a kind in Kerala Forest Department and this may be taken as a model for extending this activity to other high altitude areas.

V) SOCIO-ECONOMIC VALUES

The area provides livelihood to resource dependent communities through tourism, NWFP collection / sale, farming and animal husbandry. The water bodies of the Park are the only source of water for the tribal hamlets within and the fringe areas of Kanthalloor, Puthur, Perumala, Pazhathottam and Silanthiyar.

VI) CULTURAL VALUES

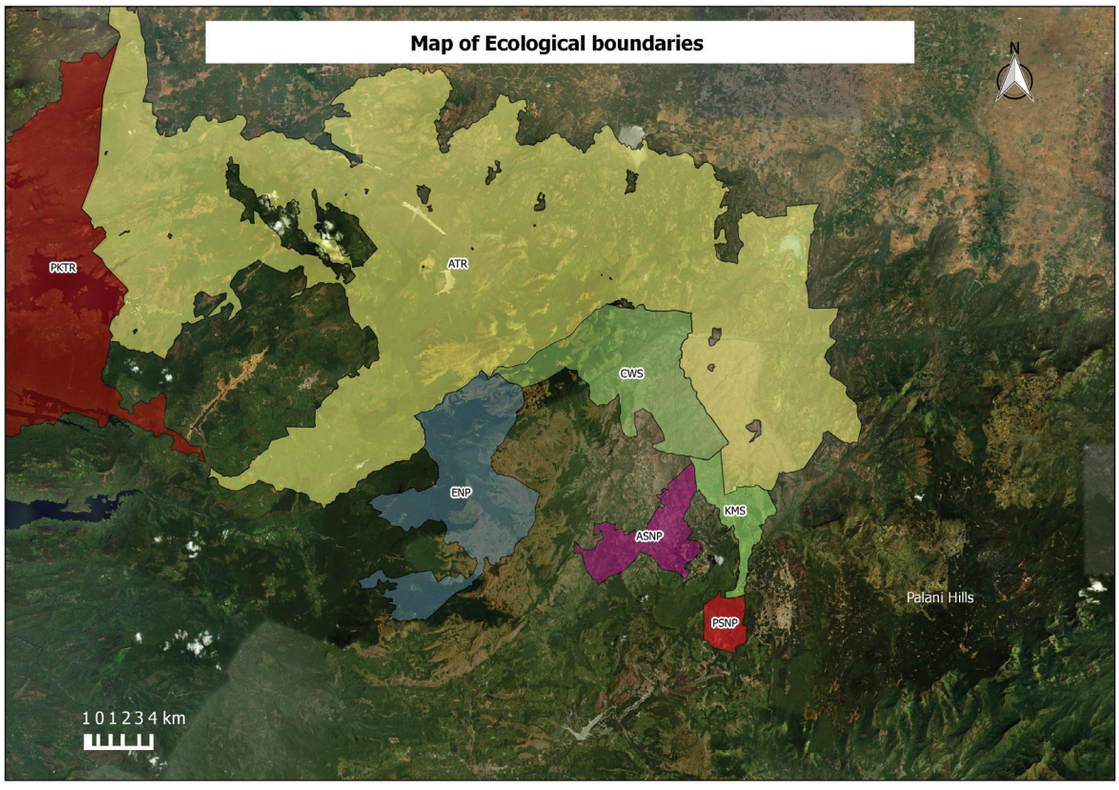
Muthuvans are the only forest dwelling scheduled tribe group inhabiting the Park area. They are a primitive group and mostly agriculturists keeping limited contact with the outside world. They prefer a secluded life fostering their own traditions and customs. They follow their own distinct practices in medicine, forms of worship, celebrations, gender relations, marriage etc. However changes in the dietary pattern, way of dressing, housing, attitude towards education etc. are observable in the recent years. There are three Muthuvan settlements inside the Park. They are Koodallarkudi, Valsapettykudi and Swamiyaralakudi. The interior tribal settlements inside the Park area play a significant role in sustaining the agricultural practices and preservation of distinct cultural identity of Muthuvan Tribes.

1.4 DESCRIPTION OF IDENTIFIED LANDSCAPE, CORRIDOR LAND USE EXTENT BY OWNERSHIP CATEGORIES AND THE CONSERVATION IMPLICATIONS.

The landscape is undulating with hillocks of varying heights. The Park is located in the Anamalai Hills of the Southern Western Ghats which is one among the 36 biodiversity hotspots in the world. It acts as a corridor between Kannan Devan Hills and Palani Hills. The Park has a direct connectivity with Kurinjimala Sanctuary, Marayoor Sandal Division and Munnar Territorial Division. The Park has landscape connectivity with Anamalai Tiger Reserve, Parambikulam Tiger Reserve, Chinnar Wildlife

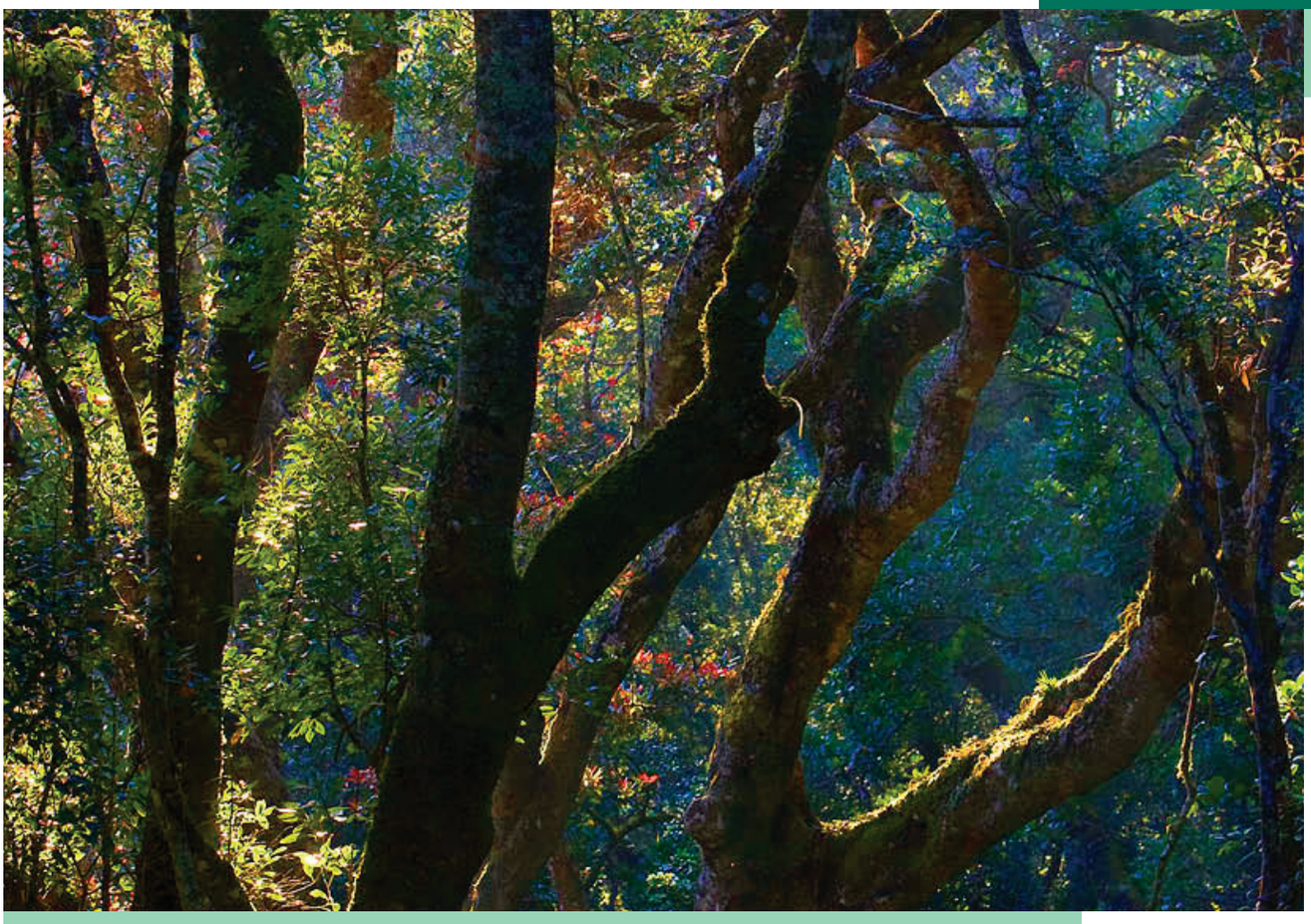
Sanctuary, Eravikulam National Park and Pampadum Shola National Park. Since the Park is connected with other PAs and other territorial divisions it serves as a corridor for the movement of wild animals. The Park is a part of the 'High Range Circle Landscape Conservation Unit' which comprises of several Protected Areas under the Anamudi Elephant Reserve. The ecological boundaries of ASNP is shown in **Figure. 1.4.**

FIGURE 1.4: MAP OF ECOLOGICAL BOUNDARIES



CHAPTER 2

Background Information and Attributes



2.1 BOUNDARIES

2.1.1.LEGAL BOUNDARIES

The boundary description as per the notification is as follows:

NORTH: - Starting from Ottakombumala (hill point 2164) on the South-Western corner of Tirthalar Proposed Reserved Forests, thence along the Southern boundary of the said Reserve till it reaches the North-Eastern corner of Mannavan Shola Reserve thence along the North-Eastern boundary of the said Reserve up to Madavarimala, thence North-East along the Southern boundary of Idivara Shola Reserve passing along hill points 2153, 2104, 2199, 2132, 2127 (Velligirimala)

EAST: - Starting from hill point at 2127 (Velligirimala) runs along the Eastern boundary of Idivara Shola Reserved Forests and Pullaradi Shola Reserved Forest till it reaches the South-Eastern corner of Pullaradi Shola Reserved Forests adjoining the boundary of Kannan Devan Hills village concession lands.

SOUTH: - Starting from the South-Eastern corner of Pullaradi Shola Reserved Forests runs more or less South along the Southern boundary of Pullaradi Shola Reserved Forests, Idivara Shola Reserved Forest and Mannavan Shola Reserved Forests adjoining to the Northern Boundary of Kannan Devan Hills village concession lands till it reaches Tirthamala.

WEST: - Starting from Tirthamala runs along Eastern boundary of Mannavan Shola Reserved Forests till it reaches hill point 2164, Ottakombumala.

More than 40% of the legal boundaries of the Park has already been surveyed and demarcated with permanent cairns / pillars during the previous plan period. The boundary from Anivara top to Jandamala via Mattuchola has to be surveyed and demarcated with permanent cairns.

The extent within the notified boundaries has also been checked and calculated by the GIS unit working under FMIS and it comes to 32.85 Km^2, whereas the notified extent is only 7.5 Km^2 (Approx.). There is substantial difference in the area of the Shola Reserves as notified in 1901 and the areas indicated on the map.

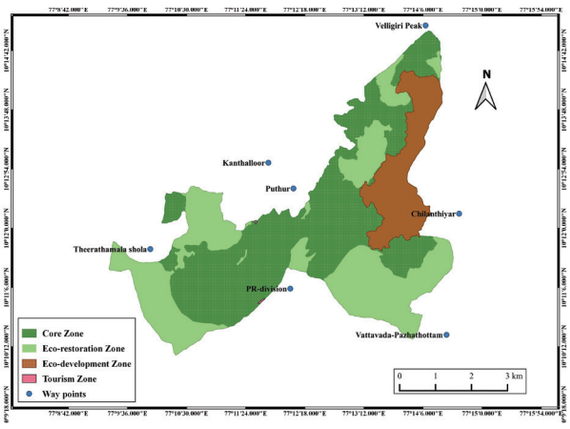
2.1.2. ECOLOGICAL BOUNDARIES

On the Northern side, the Park shares its boundary with forest areas under Kanthalloor Forest Range of the Marayoor Sandal Division and Chinnar Wildlife Sanctuary. The Eastern side, share its boundary with the Kurinjimala Sanctuary. The Park shares its Southern and Western boundary with forest under Munnar Territorial Division and KDHP Tea estates. The Park provides ecological connectivity between the Anamalai Tiger Reserve, Palani Hills of Tamil Nadu and the Reserved Forests of Munnar Territorial Division (Map showing the ecological boundaries of ASNP is depicted in **Figure 1.3**). The Shola forests adjoining the Western boundary of Idivara Shola Reserve Forest of the Park falling in the jurisdiction of Marayoor Sandal Division are yet to be declared as Reserved Forests (RF) and are presently categorized as revenue lands.

2.1.3. INTERNAL BOUNDARIES

The National Park is divided into two zones, namely the Core zone and Buffer zone. **(Figure 2.1)**

FIGURE 2.1: ZONE MAP OF ANAMUDI SHOLA NATIONAL PARK



Core zone: The Core zone is of an area of 17.79 Km^2, protected without any human interference.

Buffer zone: The Buffer zone of the National Park is 15.06 Km^2 in area and is divided into three zones namely Eco-restoration zone, Eco-development zone and Tourism zone.

a) **Eco-restoration zone:** All the plantation area in the National Park is considered as Eco-restoration zone and it comes to around 8.45 Km^2. This Eco-restoration zone shall be converted to Core zone after the eco-restoration activities.

b) **Eco-Development zone:** The area inside the National Park occupied by the tribes for habitation and cultivation, viz Swamiyaralakudi, Valsapettykudi, and Koodallarkudi are coming in this zone. The total extent of this area is 5.51 Km^2 respectively.

c) **Tourism zone:** This area includes Methappu and Perumala where the eco-tourism activities are conducted. It comes around 1.10 Km^2 and stand as Buffer zone even after the eco-restoration activities.

2.2 GEOLOGY, ROCK AND SOIL

The underlying rock formation in the Park area consists principally of gneiss of a granitic nature, very often foliated and composed of quartz, feldspar and biotite. The soil is deep in general, but shallow along the ridges and hilltops. Soils in lower slopes and valleys are considerably deeper and finer. Soil sampling and analysis of Pullaradi Shola and Mannavan Shola carried out by the KFRI showed the presence of gravel in the samples. The physical and chemical properties of the soil are shown in **Table 2.1.**

Table 2.1: Characteristics of soils from Anamudi shola forests

Location	Sand %	Silt %	Clay %	Soil pH	Organic carbon %	Av. N %	Av. P ppm	Av. K %	Av. Ca %	Av. Mg %
Mannavanshola	69	11	20	4.4	2.46	0.018	8	0.197	0.034	0.0095
Pullaradi shola	64	14	22	4.1	5.05	0.042	15	0.310	0.040	0.0096

Source: KFRI Extension Project Report No. 15

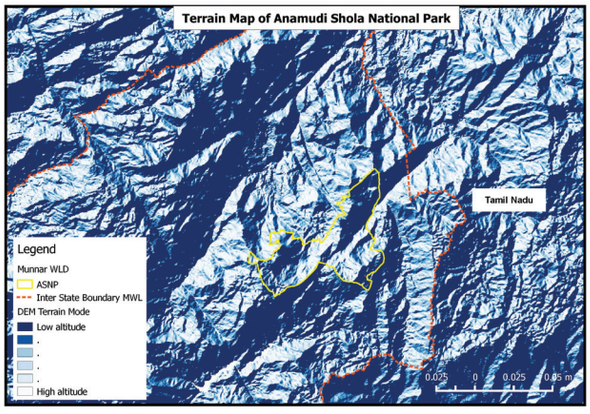
The soil of Mannavan Shola is dark brown, granular, porous and friable. It is rich in organic matter and all nutrients, faunal voids including termite nests, extremely acid and loam. The soil is low in gravel content. In Pullaradi Shola, the soil is dark brown, porous, medium in organic matter and all nutrients, disintegrating organic debris, extremely acid and loam with very low gravel content.

2.3. TERRAIN

The terrain is undulating with hillocks of varying heights. The altitude ranges from 1600 m to 2520 m. The forest is seen as a continuous patch from an altitude from 1600 m to 2200 m, above which are small Shola patches inter-spaced with the grasslands and wattle plantations. The area is traversed

by small streams which drain into the Pambar River and Thalinji Aar to reach Amaravathi River in Tamil Nadu **(Figure 2.2).**

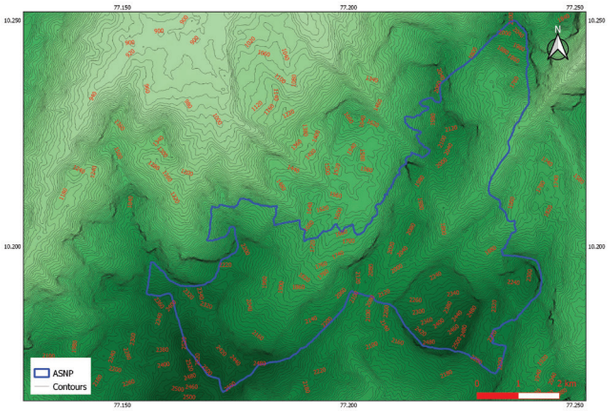
FIGURE 2.2: TERRAIN MAP OF ANAMUDI SHOLA NATIONAL PARK



2.3.1 CONTOUR MAPPING

The contour map of the Park prepared using QGIS with the help of DEM, is given in **Figure 2.3.**

FIGURE 2.3 : CONTOUR MAP OF ANAMUDI SHOLA NATIONAL PARK



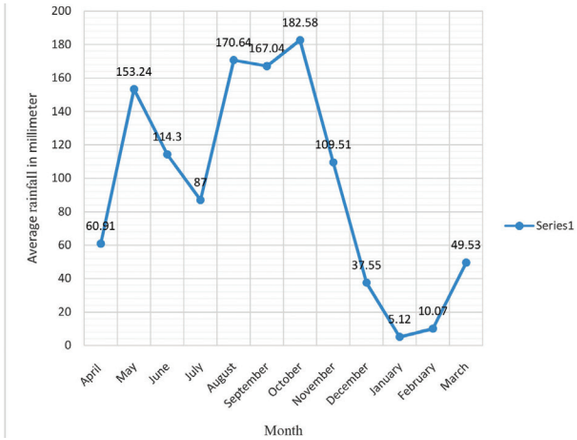
2.4 CLIMATE

The Park lies towards the North-Eastern side of the Kannan Devan Hills. Due to its geographical location the influence of South-West monsoon is less. North-East monsoon is prominent in the Park. The temperature and rainfall data of the National Park is illustrated on the basis of information collected from Chittavurrai Estate and Chundavurrai Estate adjacent to the Park.

2.4.1 RAINFALL PATTERN AND DISTRIBUTION

Average annual rainfall for the last 10 years is 992 mm and the maximum precipitation was recorded in the years 2018, 2019 **(Annexure 2.1).** Average monthly rainfall data of adjacent Chittavurrai Estate for last six years was tabulated **(Figure 2.4)**. The rainfall of this area is controlled by South-West and North-East monsoon. The trend of precipitation pattern is unique to this area. The monsoon starts on May but slightly diminishing towards the mid of July, then it strengthens in the beginning of August and continuous up to October. The monsoon ends in the final quarter of November. About 80% of rainfall is received from May to November. The maximum rainfall intensity is recorded from August to October. Occasional summer showers are common.

FIGURE 2.4: MONTH WISE AVERAGE RAINFALL AT CHITTAVURRAI ESTATE 2014-19



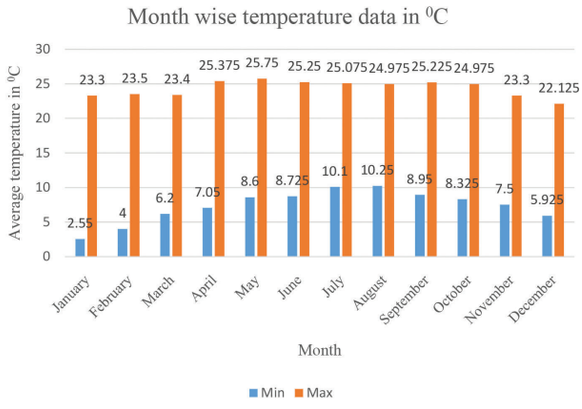
Source: Chittavurrai Estate (KDHP).

2.4.2 TEMPERATURE: A SUMMARY OF YEAR ROUND PATTERN

The annual average temperature for the past four years ranges from 5.6°C - 8.9°C to 23.4°C - 25.1°C. The highest temperature was recorded from April to October. The lowest temperature was recorded from December to February and the details collected from the adjacent Chundavurrai Estate are given here **(Figure 2.5).** The difference between the maximum and minimum temperature is very high during the winter months. The winter season starts

from December and last up to February. The temperature occasionally goes down below 0^{0} C in this winter months. The frost phenomenon is common during the winter. The average annual temperature data for the last four years is given in **Annexure 2.2.**

FIGURE 2.5: MONTH WISE TEMPERATURE DATA AT CHUNDAVURRAI, DURING 2016-19



Source: Chundavurrai estate (KDHP).

2.4.3 HUMIDITY: A SUMMARY OF YEAR ROUND PATTERN

The average humidity of the area varies from 80% - 90% during October to December. During the South-West monsoon (June to September) the humidity varies from 60% -80%. The rest of the year, the average humidity varies from 57% to 70%.

2.4.4. WIND SPEED: A SUMMARY OF YEAR-ROUND PATTERN

Upper elevation of the Park experiences heavy winds. No studies were carried out on the year-round pattern of winds and their influence on the microclimate of the region.

2.4.5 DROUGHT AND ITS PERIODICITY, NATURAL HAZARDS AND DISASTERS FREQUENCY, INTENSITY, LOSS OF LIVES, PROPERTY AND ECONOMIC LOSS AND OTHER CONSEQUENCES

Dry weather to a mild drought like conditions prevails during the months of February to May. There is mild to moderate scarcity of water and food for wildlife. Strong winds occasionally cause damage to branches of trees in wind prone areas. Heavy rainfall and flood in the State in the years 2018 and 2019, did not make any serious impact on Park and the wildlife. An unprecedented fire spread in the areas of eucalyptus and wattle plantation occurred in the year 2019, destroyed an extent of 95 ha plantations of Buffer zone. This in turn paved way to the intensification of the eco-restoration work in the area and removal of accumulated biomass from the wattle eradication areas. No instances of causality was reported within the Park, such as wildlife death due to natural calamities, cases of loss of lives, property or economic loss or other consequences. Complete close down of the eco-tourism operations and eco-shops in accordance with various directions from the Disaster Management Authority during heavy monsoon and Covid 19 pandemic outbreak had a serious adverse impact on the revenue generation in 2018, 2019 and 2020.

2.4.6 EFFECTIVENESS / PROBLEMS OF RESCUE, RELIEF AND REHABILITATION INTER ALIA THE SUPPORT OF THE NATIONAL DISASTER MANAGEMENT AUTHORITY (NDMA), THE STATE DISASTER MANAGEMENT AUTHORITY (SDMA), THE DISTRICT DISASTER MANAGEMENT AUTHORITY (DDMA), MUNICIPALITY, PRIS AND PARALLEL ORGANISATIONS (RELEVANT TO NATURAL HAZARDS AND DISASTERS).

The Park management is maintaining a good relation with State Disaster Management Authority (SDMA) and District Disaster Management Authority (DDMA) in dealing with hazards like forest fire, landslide, flood etc. Park witnessed large forest fire at Pazhathottam, Jandamala area in 2019. Park authorities successfully extinguished fire with the help of all line departments SDMA and DDMA.

2.4.7 GOVERNMENT AND NON-GOVERNMENT AGENCIES WITH WHICH CONVERGENCE OF CONSERVATION PROGRAMME IS POSSIBLE; LIKEWISE, DISPARITIES THAT ARE A PROBLEM.

For the successful implementation of the conservation programs, good rapport with line Departments such as Police, Revenue, Fire Force, Motor vehicles, Animal husbandry, Education, LSGD, Tribal

development, Agriculture, Tourism etc. are indispensable. In association with these Departments various programs are planned and implemented from time to time. Collaboration with Non-Governmental Organisations such as WTI, WCS, WWF, SPCA, TNHS, local clubs and organisations plays a substantial role in reaching out the message of conservation to the public and enhances their responsible participation in the nature conservation programs. Other institutions such as KFRI, College of Forestry, JNTBGRI, IFGTB, IISER, SACON etc. also play a key role in the field of research, studies and conservation activities.

2.5. WATER SOURCES

The Park area is the watershed of Amaravathi River. Many streams originate from this Shola and some of them are perennial in nature. All the streams from the region flow eastwards and join the Pambar River and Thalinji Aar which are the tributaries of Amaravathi River. At present 19 artificial water source exist in the Park. This includes 9 water holes and 10 check dams. The drainage map of Anamudi Shola National Park, locations of water bodies as on 2020 are illustrated in **Figure 2.6, 2.7** and its seasonality is annexed in **Annexure 2.3.**

FIGURE 2.6: DRAINAGE MAP OF ANAMUDI ANAMUDI SHOLA NATIONAL PARK

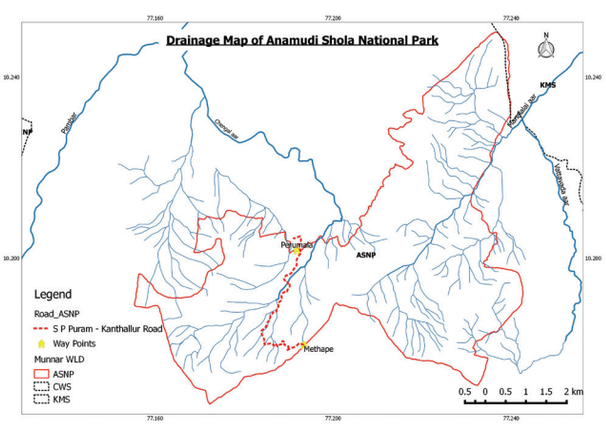
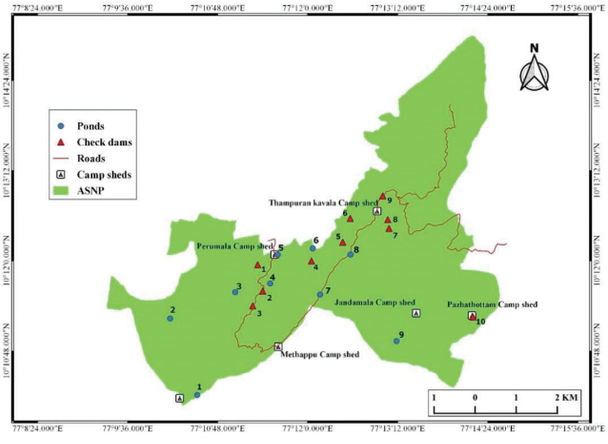


FIGURE 2.7: MAPS OF PONDS AND CHECK DAMS OF ANAMUDI SHOLA NATIONAL PARK



Ponds: 1) Iddalimotta, 2) Pattuvirippin, 3) Chengulam, 4) Pedange, 5) Perumala, 6) Isack- kadu, 7) 62-plantation, 8) Rodovalley, 9) Jandamala.

Check dams: 1) Hanumanthotty, 2) Munnam mile, 3) Onnamkurukku, 4) Puthur, 5) Thalachorkadavu, 6) Rodovalley, 7) Koodallar kudi area, 8) Vettukadu, 9) Near Methappu-Koodallar road, 10) Pazhathottam.

2.6. RANGE OF WILDLIFE, STATUS, DISTRIBUTION AND HABITAT

The Park area is the habitat, supporting a wide range of flora and fauna. A rapid plant exploration was done in the Park and a total of 389 (Angiosperms–373 and Ferns–16) plant species belonging to Pteridophytes and Angiosperms were identified from the Park. 31 species of Mammals (excluding rats and shrews), 122 species of Birds, 18 species of Reptiles, 19 species of Amphibians, 124 species of Butterflies, 19 species of Odonates and 8 species of Ants were recorded from the National Park in the previous years. Tigers and elephants use the Park as part of their home range. The Park has habitat continuity with other forests of Kerala and Tamil Nadu facilitating free movement of animals and preserving the gene pool. The range quality of grasslands has been severely damaged due to the invasion of wattle and eucalyptus plantation on the natural vegetation and grasslands. The 3 tribal settlements inside the National Park have significant impact on the range of wildlife and habitat.

2.6.1 VEGETATION

The areas of Anamudi Shola National Park is characterised by the Tropical Montane vegetation and generally acknowledged as Shola forest. A rapid plant exploration was conducted in which a total of 389 (Angiosperms–373 and Ferns–16) plants species belonging to Pteridophytes and Angiosperms were identified from the Park. Angiosperms of 87 families and 227 genera were recorded from the area. Of these, nearly 186 taxa are 'endemic'. The threatened category of plants recorded from the area includes, 4 Critically Endangered, 14 Endangered and 24 Vulnerable species. **(Annexure 2.4).** The most dominant tree species in this Shola are; *Cinnamomum perrotetti, Dysoxylum binectariferum, Gomphandra coriacea, Hydnocarpus alpina, Litsea udayanii, Mastixia arborea, Nostolachma crassifolia, Symplocos monantha, Syzygium densiflorum and Turpinia cochinchinensis.* Shrubaceous layer comprises *Andrographis affinis, Strobilanthes tristis* etc. Herbaceous layer mainly includes *Heracleum candolleanum, Vanasushava pedata, Arisaema leschenaultia, Arisaema psittacus, Arisaema sarracenioides* etc. Major woody climbers recorded from the Park are *Elaeagnus kologa, Gardneria ovata, Embelia adnata, Embelia ribes* etc. Anamudi Shola National Park harbours a wide variety of Pteridophytes. Totally 16 species were identified from the Park. **(Annexure 2.5).** *Pteris cretica* is a critically endangered fern present in the Shola forest, which is previously reported from Avalache, Nilgiri district. Rare species such as *Asplenium zenkaranum, Pteris perrotteti, Pteris multiaurita, Pyrrosia beddomei, Selaginella involvens, Phymatosorus beddomei* etc. are also present in the Park. The endemic and endangered species like *Pteris perrotteti* and *Cyathea nilgirensis* are abundant in the evergreen patches of the forests. The vegetation commonly present is natural Shola vegetation inter spaced with grasslands. But the grasslands were severely damaged and Shola forests are threatened due to the infestation of wattle and eucalyptus plantation posing severe threat to the natural ecosystem and its conservation. Thus, the biodiversity conservation of the Shola forests therefore demands serious attention.

2.6.1.1 THE BIO-GEOGRAPHIC CLASSIFICATION

The region lies in the bio-geographical zone of Western Ghats mountains (5b) (Rodgers et al., 2000) and the Eco-region of South Western Ghats Montane Forest.

2.6.1.2 FOREST TYPES, COVER AND FOOD FOR WILD ANIMALS

The term 'Shola' is a corrupt form of the Tamil word 'Colai' borrowed and incorporated into forest typology by Schimper (1903). In Tamil, the term 'Colai' (Malayalam: Chola) refers to a cold place, a thicket, etc. The Shola forests actually represent a continuation of the evergreen forests in response to the elevational gradient, the sequence being: Subtropical Hill Forests and Southern Montane Wet Temperate Forests and Grassland. The Shola forests are of high ecological significance in protecting the head waters of rivers. They also help in retaining soil moisture and very slow release of rain water. 'Shola forests' are tropical forest vegetation generally seen over 1,500m MSL. The major forest type of the Park is Southern Subtropical Hill Forests along the lower region Southern Montane Wet Temperate Forests (Champion and Seth, 1968) towards the top. A community ecological, floristic and regenerative study was made by Swarupananthan K. et, al. (1998) in Mannavan shola of ASNP. The forest types inside the Park are:

1. SOUTHERN SUBTROPICAL HILL FORESTS (8A/C1)

Southern Subtropical Hill Forests are known as transition belt of Shola forest. Even though the vegetation is similar to tropical rain forest, it is not as luxurious that of the rain forest. The trees are smaller, with less shapely boles, and often festooned with herbaceous and cryptogamic epiphytes. Strobilanthes spp. is frequently seen as dense undergrowth of the forest.

FLORISTICS: -

I. *Syzygium densiflorum, Gomphandra coriacea, Turpinia cochinchinensis, Dysoxylum binectariferum, Gordonia obtuse, Hydnocarpus alpine, Cinnamomum perrotetti, Nostolachma crassifolia, Machilus macrantha, Canthium rheedei, Diospyros trichophylla* and *Vernonia arborea,* etc.

II). Strobilanthes spp.

III). *Arisaema sarracenioides*, Impatiens spp

2. SOUTHERN MONTANE WET TEMPERATE FORESTS (11 A/C1)

The forest type comprises Southern Montane Wet Temperate Forest (Shola forest) and Southern Montane Wet Temperate Grassland (Grassland). These are closed forest patches with reduced tree height (12-15 m height) and increased complexity in the leaf thickness and complexity in tree architecture. The other significant features are; tree bark clothed with mosses and lichens, prolific growth of epiphytes, good diversification of ferns etc. Epiphytes possess high level of endemism due to the restricted habitat.

FLORISTICS: -

I. M*astixia arborea,* Ilex spp*, Elaeocarpus recurvatus, Meliosma simplicifolia, Rhododendron arboreum* J. E. Smith ssp. *Nilagiricum, Daphniphyllum neilgherrense.*

II). *Vernonia anamallica, Vernonia bourneana, Vernonia fysonii,*

III). *Blumea oxyodonta,* Impatiens spp

3. SOUTHERN MONTANE WET TEMPERATE GRASSLAND (11A/C1/DS2)

The grasslands cover the plateau and descending slopes of the Park. The high-altitude grasslands are extensive and consist of grasses, herbs and under shrubs. The dominant species of grasslands are *Chrysopogon zeylanicus, Arundinella fuscata, Dichanthium polyptychum, Eulalia pheothrix,* etc.

The major grass species in the grasslands are; *Andropogon lividus, Arundinella vaginata, Digitaria wallichiana, Arundinella mesophylla. Chrysopogon zeylanicus* and *Sehima nervosum* dominate these plateau and slopes, whereas in the cattle grazed areas, unpalatable *Cymbopogon flexousus* is common. *Sehima nervosum* community is commonly found throughout the plateau. Moist valleys are characterized by Garnotia sps. Other dominant grasses are; *Eulalia phaeothrix, Ropogon lividus, Arundinella purpurea, Agrostis peninsularis, Ichaemum indicum, Heteropogon contortus* and *Tripogon bromodies*. The common non-grass species in the grasslands are; Anaphallis sp., Swerita sp., *Hypericum mysurensis, Phlebophyllum kunthianum,* Eupatorium sp. Viola sp. and *Pteridium aquilinum.*

The common herbs and shrubs in the grasslands include *Anaphalis lawii, A. bourneii, A. meeboldii, Swertia corymbosa, Polygala japonica, Curculigo orchiodies, Micromeria biflora, Bupeurum distichophyllum, Crotalaria fysonii, Crotalaria overlifolia, Ranunculus reniformis Hydyotis swertiodes, Sencio lavandlaefolious, Parnassia mysorense, Pedicularis zeyalanica, Wahlenbergia gracilifolia, Impatiens pandata, Impatiens modesta, Pheldophyllu kunthianum, Hypericum mysorense, Pteridium aquilinum, Ageratina adenophora* and *Gaultheria sragrantissima* etc.

4. SOUTHERN MONTANE WET SCRUB (11A/C1/DS1)

Scrub type forest is seen in open areas. This is one of the degraded forms of Southern Wet Temperate Forest. Generally, it is a low evergreen scrub of varying density often with bracken ferns and seedlings or stunted growth of Shola species.

5. PLANTATIONS

The Park and neighbouring areas are characterized by the presence of high concentration of captive plantations of wattle, eucalyptus and pine. These plantations pose a grave threat to the natural Shola ecosystem.

2.6.1.3 SPECIES & COMMUNITIES OF CONSERVATION IMPORTANCE; KEY AREAS

The protection measures and conservation activities are applicable to the entire floral and faunal communities. Several endangered species of fauna and flora are seen in the Park and they require conservation measures for their long-term survival and proliferation.

2.6.2 ANIMALS AND HABITATS

A) MAMMALS

The Park is an ideal habitat for the conservation of mammalian species especially for the small mammal. Mammalian diversity of the Park was documented by the Park management in the year 2019, while the Bat survey was executed separately utilizing the expertise of Mr. Sreehari Raman (Chiropterologist). A total of 31 species belonging to 20 families under 28 genera were identified from the Park, of which 8 species are included in the order of Chiroptera (Bats). According to IUCN Red List of Threatened species (IUCN, 2016), 12 species are included in Threatened category namely, 4 species are Endangered and 8 species are Vulnerable. Of the 31 species, 5 species are endemic to Western Ghats **(Annexure 2.6)**. Among the 31 species recorded, 26 species are protected as per the Wildlife (Protection) Act under its various Schedules. (10 species come under Schedule I, 8 species under Schedule II, 3 species under Schedule III, 4 species under Schedule IV and 1 species under the Schedule V).

B) BIRDS

The Munnar Wildlife Division in collaboration with Travancore Nature History Society (TNHS), Trivandrum, conducted a series of surveys during the period 2017-20 and a checklist of 123 species of Birds was prepared. Of the 231 species of Birds recorded from the areas of Munnar Wildlife Division, a total of 123 Birds are seen in the Park **(Annexure 2.7).** According to the IUCN Red List, 112 species are of Least Concern, 2 are Not evaluated, 3 are Near threatened 4 are Vulnerable, 1 is Endangered. Among this list 10 species are endemic to Western Ghats. 9 species come under Schedule I, one species is under Schedule II, 91 species come under Schedule IV and 1 species under the Schedule V of the Wildlife (Protection) Act 1972.

C) REPTILES

A total of 18 species of Reptiles belonging to 16 genera falling under 7 families were recorded from the Park **(Annexure 2.8).** Most number of species belong to the family Colubridae and Scincidae (4), followed by Uropeltidae with 3 species. Out of these 18 Reptile species recorded from the Park, 10 are endemic to Western Ghats. The Anamalai Gecko *(Dravidogecko anamallensis)*, Gunthr's Vine Snake *(Ahaetulla dispa)* and Large Scaled Green Pit Viper *(Trimeresurus macrolepis)* are included in the Near Threatened (NT) category of the IUCN Red List of Threatened species. All the 9 species of snakes recorded are protected under Schedule IV of the Wildlife (Protection) Act, 1972. The presence of a number of endemic and protected reptiles points out the significance of the Park and its conservation.

D) AMPHIBIANS

19 species of Amphibians belonging to 8 families, under 10 genera were recorded from the Park **(Annexure 2.9)**. The family Rhacophoridae (9) represents most number of species of amphibians, followed by Nyctibatrachidae (4). *Rhacophorus pseudomalabaricus, Raorchestes munnarensis, Raorchestes sushili. Raorchestes chlorosomma* is included in the Critically Endangered (CR) category of IUCN Red List. All the above 19 species recorded from the National Park are endemic to Western Ghats.

E) BUTTERFLIES

A series of systematic butterfly surveys were done in the Park with the help of Travancore Nature History Society (TNHS), Trivandrum since 2012. The checklist containing 124 species of Butterflies (Kalesh 2019) is annexed. **(Annexure 2.10)**. The checklist includes 6 species of butterflies included in the IUCN Red List. Of them 5 species are under the Least Concern category while 1 species, Nilgiri Tiger, *Parantica nilgiriensis* (Moore, 1877), is Near Threatened. The National Park has 14 species listed in the Schedules of the Wildlife (Protection) Act, 1972. Oriental Common Mime and Danaid Egg Fly are under Schedule I. Eight other species are listed under Schedule. II and 4 species are under Schedule IV. 21 species are endemic to South India and 13 are endemic to Western Ghats.

F) ODONATES

In association with the Trivandrum based Travancore Nature History Society (TNHS), a series of surveys of Odonates was undertaken from 2016 onwards, by the Munnar Wildlife Division. As per the latest checklist the total number of Odonates species found is 19 (Kalesh 2019). This includes 19 species listed under the Red list of IUCN and 3 species that are endemic to Western Ghats **(Annexure 2.11).**

G) ANTS

Ant survey was conducted during the period 2019-20 in the Park. A total of 8 species belonging to 3 sub families were identified from the Park area **(Annexure 2.12).** Among the species, most of them belongs to the sub family Myrmicinae (4 species), followed by Formicinae (3 species) and Dolichoderinae (1 species).

2.6.2.1 VERTEBRATES & THEIR STATUS, DISTRIBUTION AND HABITATS; HABITAT QUALITY, QUANTITY AND KEY AREAS

The details of various categories of vertebrates are given in **Annexure 2.6, 2.7, 2.8 and 2.9.** Since the Park is small in area, the resident population of these groups is low when compared with other Protected Areas. However, the Park acts as a connecting link between Kannan Devan hills and Palani hills which ensure the movement of wildlife between these two regions. The quality of the habitat is good and healthy and offers itself as an abode for the wildlife of the region.

2.6.2.2 THE LIMITING FACTORS

The dry spell during the months of February-May and the very cold months of December-January limits the availability of food resources to a certain extent. However, artificial sources of water are created in some areas to meet the water requirements of wildlife. Presence of invasive species plantations such as eucalyptus, black wattle and pine are a great threat to biodiversity of the Park.

2.6.2.3 IMPORTANT INVERTEBRATES, THEIR STATUS, DISTRIBUTION & HABITAT

The details of various categories of invertebrates found in the Park are given in **Annexure 2.10, 2.11 and 2.12.** The invertebrate populations are distributed across the Park along the different vegetation types. There is a scope for the presence of more number of Odonates & Ants in the region and further studies in this regard is required to find out the same. George Mathew and K. Mohandas identified 344 species of insects under 10 orders and 73 families from Manavan Shola of ASNP in 2001 (KFRI/297/98)

CHAPTER 3

History of Management and Present Practices

3.1 GENERAL

The forest area of Anamudi Shola National Park consisting of Mannavan Shola Reserve Forests No.58, Pullaradi Shola Reserve Forest No.57 and Idivara Shola Reserve Forest No.56, were part of erstwhile Travancore Kingdom before the advent of the British rule. In alignment with the colonial forest management policies, a detailed Forest Act was passed in 1893 and rules and regulations were framed by Travancore Kingdom based on the Act. In 1896, the Forest Department was totally re-organised on the lines of the British Forest Administration and the forest area was divided into Divisions and Ranges. As the colonial Forest Policy greatly understood and appreciated the economic values of forests the Anamudi Shola area was notified as Reserved Forest under Section 18 of Regulation II of 1068 on 22nd October 1901, and published in the Travancore Gazette. Being Shola forests, these areas were managed under the protection-working circle for the purpose of conservation of water sources. Subsequently, these Sholas came under the jurisdiction of the Anchunadu Range of the High Range Division for a brief period. In 1946 they were made part of Muvattupuzha Division and in 1950 Muvattupuzha Division was amalgamated with Malayattoor Division. The Working plan of Malayattoor Forest Division for the period 1951-52 to 1966-67 was prepared by Sri.T. P Viswanathan. The Working Plan had placed the area under the Protection Working Circle. It says “A study of the topography of the area, the nature of the slopes and the general lie of the cultivable portions in the low country will reveal the significance of the relation between forest lands and agriculture and it would readily be recognized that if the existing rainfall should be of any value to the agricultural fields down the slope and it is imperative that the forest cover on the higher slopes should be preserved and maintained. It is also a fact that the local population depends on the streams that come down these slopes for irrigating their fields, and if these streams are to be kept going during the hotter part of the year when irrigation is a necessity when the “little waters” of the head-water supply area have to be protected by maintaining a perpetual forest cover. But when the mountain forests are cut down the sponge like properties of the forest floor are destroyed that it is unable to retain the rain water. Consequently, the proportion of run off to precipitation increases and with the rise in the runoff erosion commences. The result will be that both the soil and the water that it should have retained come down the slopes. The general tendency of the common man is to ignore the effects of erosion until it becomes a life and death problem”.

In the year 1963 the Shola Reserve became part of the Marayoor Range of the newly formed Munnar Forest Division. Most of the grasslands were converted to plantations of black wattle and eucalyptus during 1970s and 80s. During 80s and 90s most of the lands in the valley were purchased or occupied by outsiders and large-scale planting of eucalyptus and other plantations started. The above plantations were promoted as a source of raw material for paper industry. The large-scale destruction of native vegetation and introduction of exotic species in this area ultimately led to a situation of acute water scarcity in this relatively low rainfall area. The importance of the perennial water flow from the Anamudi Shola has to be viewed against this scenario.

Identifying the ecological importance of this area, it was declared as National Park vide the **Notification No.12876/F2 2003/F & WLD dated 14.12.2003** of the Kerala Government.

3.2 TIMBER OPERATION INCLUDING BAMBOO AND FIREWOOD

Anamudi Shola was declared as National Park in the year 2003 and no timber operations / harvesting of any kind, including bamboo, were carried out in the National Park thereafter. Permission is being granted to the local communities for the collection of firewood, out of the invasive species such as wattle and eucalyptus.

3.2.1 SILVICULTURAL SYSTEMS AND TENDING OPERATIONS

No silvicultural system / tending operations were carried out in the area after its declaration as National Park.

3.2.2 EVEN AGED SYSTEMS AND UNEVEN AGED SYSTEMS

Before the declaration of National Park, the area was administered by Munnar territorial division and subsequently by Marayoor Sandal Division. The exotic plantations present in the area were clear felled on attaining rotation. After the declaration of National Park, no silviculture system was practiced.

3.2.3 FIREWOOD HARVEST AND COLLECTION

The inhabitants of the tribal settlements inside depend on the Park to meet their requirement for fire wood. Permission is granted to collect dried twigs and branches of wattle and eucalyptus trees from the buffer area for their bonafide use.

3.3 NON-WOOD FOREST PRODUCE (NWFP) COLLECTION.

There are three tribal settlements inside the Park, viz. Koodallarkudi, Swamiyaralakudi and Valsapettykudi. The Muthuvan tribes of these Park are involved in the collection of NWFP. The major NWFP collected from the Park is wild honey, thippali, bhadraksham, kattupadavalam etc. The collection is allowed from the permitted areas of the Park under the supervision of staff. The Honey collected is marketed through the eco-shop of Pampadum Shola National Park. The details and quantity of NWFP collected is given in the table below **Table.3.1**

TABLE.3.1. DETAILS OF NWFP COLLECTED FROM THE PARK

SL. NO.	ITEMS	QUANTITY
1	Fire Wood	670 Head loads / Annum
2	Honey	65 Kg / Annum
3	Thippali	12 Kg / Annum
4	Kattupadavalam	50 Kg / Annum
5	Bhadhraksham	Data not available

3.4 LEASES

There are no existing leases over the Park area.

3.5 OTHER PROGRAMS AND ACTIVITIES

Eco-development: At present, three Eco-Development Committees are functioning in the Park and are engaged in tourism and protection activities. They are Koodallarkudi EDC, Swamiyaralakudi EDC and Valsapettykudi EDC. The EDCs are involved in the protection, management and participatory fire management activities during fire season.

Eco-restoration: The eco-restoration programs in the Park include eradication of wattle, removal of accumulated biomass and restoring the area with natural grass and Shola species. A pilot eco-restoration programme was initiated in Pazhathottam area in approximately 2 ha in the year 2019-20. From the success of eco-restoration programme done in the 2 ha area, this strategy will be extended to the plantation area inside the National Park.

Protection and allied activities: Regular perambulations and frequent raids have been conducted in

the Park. The annual maintenance of trek paths, firelines, control burning and maintance of artificial water bodies are being carried out meticulously.

3.6 PROTECTION

The Muthuvan tribal settlements of Koodalar, Valsapetty and Swamiyarala are situated inside the Eastern part of the National Park. The colonies namely, Perumala, Puthur, Kanthalloor and Kulachivayal are situated on the Northern outskirts of the Park. These colonies are inhabited mainly by the people migrated from various parts of Tamilnadu long back. As per the data available from Kanthalloor Panchayath, there are about 631 households in these seven settlements as on 2019. They graze their livestock around their hamlets / colonies. They are the primary stakeholders of the Park. There is a mushrooming growth of tourism and home stays around the outskirts of the Park after 2000. Aiming at tapping the tourism potential, people from various part of Kottayam, Eranakulam, Idukki etc. relocated to the area. This triggered the growth of tourism facilities and farming around the fringe areas. All these facilities depend on water from streams of Shola for their household, tourism and farming purpose. In the above mentioned scenario it is very significant that the boundaries of the Park have to be properly demarcated and maintained, otherwise it would lead to encroachments. It is also necessary that descriptions of boundaries shall be precise and that tally with boundaries in the field.

As per the **Notification No.12876/F2 2003/F & WLD dated 14.12.2003 of the Kerala Government the extent of the Park is 750 ha** (approx.). The extent within the notified boundaries was measured and verified by the GIS unit working under FMIS and it comes to 32.85 Km^2. Some discrepancies have been noticed with regard to the area of the three Reserve Forests. For instance, there is a vast difference in the area of the Shola Reserves as notified in 1901 and the areas indicated on the map. This has been specially noted in the Working Plan for Malayattoor Division for the period from 1951-52 to 1966-67. According to the Working Plan, the area of three Shola Reserves viz. Pullaradi, Idivara and Mannavan are 3000 acres (12.14 Km^2), 3000 acres (12.14 Km^2) and 3100 acres (12.54 Km^2) whereas the notified area is only 750 ha (7.5 Km^2).

The discrepancies in the area in the above documents and in the field are shown in **Table 3.2.**

TABLE 3.2: DIFFERENCES IN THE EXTENT OF SHOLAS IN ASNP

NAME OF RESERVE	AREA AS PER THE ASNP NOTIFICATION (ACRES)	AREA AS PER WORKING PLAN OF MALAYATTOOR DIVISION DURING 1951-52 TO 1966-67 [ACRES/ (KM2)]	AREA AS PER GPS SURVEY (KM2)
Pullaradi shola	400	3000 / (12.14)	**32.85**
Idivara Shola	150	3000 / (12.14)	
Mannavan shola	1280	3100 / (12.54)	

The previous Working Plans also had pointed out this anomaly and prescribed for its rectification but it is not carried out yet. Presently a Section Forest Officer and four Beat Forest Officers are deployed from Kadavari Forest Station for the protection of the Park. At present there are five anti-poaching

camp sheds in the Park. Areas under the Park are divided into 5 patrolling units. Patrolling, camping, perambulation, raids etc. are conducted regularly in the area. The Assistant Wildlife Warden and Wildlife Warden have been closely monitoring the protection activities.

3.6.1 LEGAL STATUS

Legal Status of the entire area is that of a National Park declared as per the Section 35(1) of the Wildlife (Protection) Act, 1972. As per the **Notification No.12876/F2 2003/F & WLD dated 14.12.2003 of the Kerala Government the extent of ASNP is 750 ha** (approx.). The extent within the notified boundaries was measured and verified by the GIS unit working under FMIS and it comes to 32.85 Km^2. The final notification is pending. The Park consists of three Reserve Forests namely Mannavan Shola Reserve No. 58, Pullaradi Shola Reserve No. 57 and Idivara Shola Reserve No. 56 which were notified on 22nd October 1901 under Section 18 of Regulation II of 1068.

3.6.2 HUNTING

There is no history of game hunting in any of the Shola Reserve. Even though there are tribal settlements in the Park and communities along the outskirts, regular patrolling, perambulations, interior camping, frequent raids etc. carried out by the department in potential areas like Pazhathottam, Perumala, Puthur, Idallimotta, Mattuchola kept illicit felling, ganja cultivation, hunting, poaching etc. under check.

3.6.3 ILLEGAL ACTIVITIES

Instances of illegal activities common in the area were illegal entry to the forest area, collection of fire-wood, cattle grazing etc. Intensive regular patrolling, perambulations, interior camping, and participatory forest management programs play an integral role in the suppression of illegal activities. Already an internal secret data system for offenders are there in place in the PA.

3.6.3.1 POACHING

No poaching cases were reported in the National Park for the last ten years.

3.6.3.2 ILLEGAL FELLING OF TREE

No illegal felling of trees are reported in the Park over the last ten years.

3.6.3.3 ILLEGAL REMOVAL OF NWFP, ENCROACHMENT & OTHER ILLEGAL ACTIVITIES

During the past ten years no cases of illegal removal of NWFP was reported from the Park. Individual rights under the Tribal Rights Act have already been issued to the three settlements viz. Swamiyaralakudi, Koodallaarkudi and Valsapettykudi. A few families have not yet submitted the application for individual rights. The areas earmarked for the Tribal Settlements are demarcated with pillars. About 40 % of the Park boundary is consolidated with permanent cairns during the previous plan period. 60 % of the South and South East boundary of the Park needs to be consolidated. No cases of encroachment of forest were reported in the National Park area during the past ten years. No ganja cultivation has been reported from the National Park in the past ten years. The climate and terrain are ideal for ganja cultivation, but regular monitoring, interior camping and raids in the area helps to prevent all kinds of illegal activity in the Park.

Totally, four offences were reported in National Park over last ten years and the cases were registered in the category of trespassing and habitat destruction. The details of offences are given in the **Table 3.3.**

TABLE 3.3: DETAILS OF OFFENCES OVER LAST 10 YEARS IN ASNP

SL. NO.	PAS	YEAR	TYPE OF OFFENCE	CASE NO.	STATUS
1	ASNP	2015	Trespass	OR-01/2015	Charged
2	ASNP	2017	Trespass	OR-01/2017	Charged
3	ASNP	2019	Fire	OR-02/2019	Charged
4	ASNP	2019	Fire	OR-02/2019	Charged

Details of cases booked from nearby ranges of Devikulam, Kanthaloor and Munnar during 2013 to 2020 is given in the **Table 3.4.** A total of 333 cases where booked in Devikulam Range, 124 cases in Kanthaloor and 27 cases in Munnar through these years while only four cases was booked in ASNP. This shows the protection efficiency of the PA.

TABLE 3.4: LIST OF CASES RECORDED FROM THE NEARBY RANGES OF ASNP

		NUMBER OF CASES BOOKED IN			
SL. NO.	YEAR	ASNP	DEVIKULAM RANGE	KANTHALOOR RANGE	MUNNAR RANGE RANGE
1	2013	Nil	58	10	2
2	2014	Nil	50	22	2
3	2015	1	39	21	1
4	2016	Nil	33	11	2
5	2017	1	43	20	7
6	2018	Nil	35	19	3
7	2019	2	39	14	7
8	2020	Nil	36	7	3
	TOTAL	**4**	**333**	**124**	**27**

3.6.4 LIVESTOCK GRAZING

Moderate grazing occurs in grasslands adjoining to the tribal settlements. Movement of domesticated cattle through the National Park is completely banned to avoid the possibility of potential threat of communicable disease to wildlife.

3.6.5 WILD FIRES

The National Park is sharing boundaries with a number of private holdings and human settlements. Fire incidents in the private lands are spreading into the forest causing forest fire. Besides this the eucalyptus and black wattle plantations inside the National Park increases the chance of forest fire. Periodical fire awareness programs and training are conducted for staff, tribal communities inside the Park and and local inhabitants in the fringe areas.

Seven firelines with a length of 39.4 Km. were maintained annually to protect the Park from fire **Table 3.5 & Figure 3.1** The annual fireline maintenance is carried out based on the allocation of fund. During the last ten years eight fire incidents had occurred in the National Park. Of which, around 111 ha of wattle and eucalyptus plantations were distroyed by fire. The details of fire occurrences in Park are given in **Table. 3.6, Annexure 3.4.** Fire protection camps are established in six locations viz. Mattuchola, Pazhathottam, Thamburankavala, Idallimotta, Beppurmala and Jandamala during fire season. Besides these, fire gangs are also engaged for protecting the Park from fire. During the fire season a firefighting unit is functional, with a vehicle and essential equipment.

Table 3. 5: Fireline of ASNP

Sl. No.	Name	Length (Km.)	GPS Reading	
			Starting Point	End point
1	Around Koodellar fireline.	3	10°12'10.84"N 77°13'28.42"E	10°13'4.47"N 77°13'31.18"E
2	Idivara - Koodallar.	3.7	10°12'10.66"N 77°13'28.17"E	10°11'50.08"N 77°14'1.99"E
3	Pazhathottam - PR.	5.2	10°11'2.80"N 77°14'11.30"E	10°11'10.72"N 77°12'35.77"E
4	PR - Iddalimotta - Ottakombumala.	8.1	10°11'10.72"N 77°12'34.46"E	10°11'21.30"N 77° 9'36.75"E
5	Swamiyarlar - Pazhathottam.	2.2	10°11'52.01"N 77°14'5.86"E	10°11'4.41"N 77°14'12.34"E
6	Theertham - Theerthamala.	4.2	10°11'53.14"N 77°11'17.85"E	10°11'27.56"N 77° 9'47.57"E
7	Theerthamala - Perumala - Mattuchola.	13	10°12'5.07"N 77°10'7.30"E	10°14'44.79"N 77°13'55.23"E
	Total	39.4		

Figure 3. 1: Fireline of ASNP

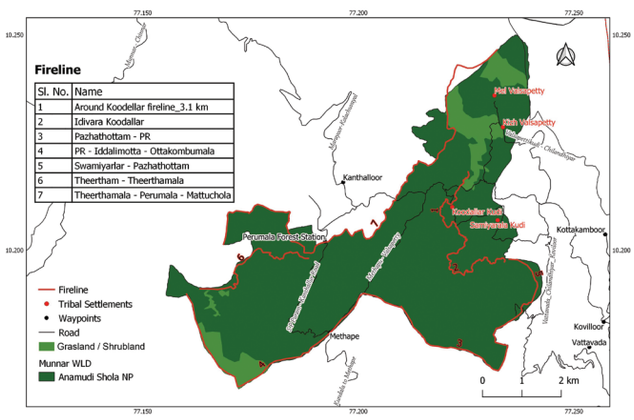


TABLE 3. 6: PREVIOUS FIRE INCIDENCES

SI NO.	YEAR	LOCATION	EXTENT OF AREA AFFECTED
1	2011	Pazhathottam	3 ha
2	2016	Melevalsapetty kudi	2 ha
3	2016	Anivara	3 ha
4	2016	Pazhathottam	5 ha
5	2018	Irikkamedu	2 ha
6	2018	Anivara	1 ha
7	2019	Pazhathottam	25 ha
8	2019	Jandamala	70 ha
		TOTAL	**111 HA.**

3.6.6 INSECT ATTACK AND PATHOLOGICAL PROBLEM

No severe case of insect attack or pathogens has been reported from the National Park

3.6.7 WILDLIFE HEALTH

Livestock in the surrounding villages and settlements pose potential threat and health issues among the wildlife in the Park. The livestock of settlements and fringe area people are vaccinated periodically. Necessary steps are taken with the help of line departments to prevent the spread of disease to the wildlife. Presently, there is no protocol for monitoring the wildlife health in the Park area. There is no rescue and rehabilitation centre for wildlife in distress in the area.

3.6.8 INTER-AGENCY PROGRAMS AND PROBLEMS

The construction activities of various agencies, local bodies etc. in the tribal hamlets within the Park often end up in conflict. Most of the construction, development projects are planned without considering the legal restrictions in the forest land. Non-compatibility between the objectives of conservation and the unsustainable nature of the development activities implemented by various agencies at times causes strained working relationship. Social and religious organizations, clubs etc. also come up with various welfare / charitable programs.

At present, there is no system of integrating and dovetailing the activities of different agencies. Because of the haphazard ways in which different agencies operate, the ongoing eco-development programme keeps losing its focus and the tribal often confuse it as negative programme that thwarts other developmental opportunities.

3.7 TOURISM & CONSERVATION EDUCATION

On account of the cool weather round the year, microclimate, picturesque landscape, waterfalls etc. Anamudi Shola National Park is a favourite destination of tourists, travelers and nature lovers. The largest Shola forest in South India, Mannavan Shola is located in the Park. The extensive view of Anchunadu area, wildlife sightings and the cold, misty and windy climatic conditions are the key attractions of the Park. The eco-tourism programs include accommodation and guided trekking. Accommodation facilities are offered in Log House and Stone House at Methappu and Stone House

at Perumala. There is a watch tower at Methappu which offer a panoramic view of the Shola forests and Anchunadu valley. There is an information centre at Methappu, at the entrance to the Park from Kundala side. Advance bookings and permissions through online website of the Munnar Wildlife Division and offline booking at Information Centre attached to the Office of Wildlife Warden, Munnar is also made available. All the eco-tourism activities of the Park are carried out through the Trekkers EDC. Presently there is no proper waste management plan for the PA. All the garbage including plastics was collected with the help of EDC members in poly bags and dumped in the panchayath dumping yard.

The rates of accommodation and trekking are revised in the FDA General Body from time to time. There was a decline in the revenue in 2018-19, 2019-20 following the heavy damage caused to the roads of Idukki District during the 2018, 2019 floods & rains and in the wake of Covid 19 pandemic in 2020. Peak season is from October to February and the Park will be closed in the wake of disasters, epidemics and fire incidents, in compliance with the rules and regulations issued by the Disaster Management Authority and the Government. The details of visitors and revenue generated from Eco-tourism from 2015-16 to 2019-20 was given in **Table 3.7.**

TABLE 3.7: DETAILS OF VISITORS AND REVENUE FOR LAST 5 YEARS OF ASNP

YEAR	INDIANS	FOREIGNERS	TOTAL	GOVT. REVENUE
2015-16	41	0	41	943
2016-17	4787	0	4787	110101
2017-18	3657	0	3657	84111
2018-19	181	0	152	3800
2019-20	367	0	367	11010
TOTAL	**9033**	**0**	**9004**	**209965**

3.8 RESEARCH, MONITORING AND TRAINING

3.8.1 RESEARCH AND MONITORING

A camera trap exercise was conducted in the Park in 2019 that resulted in identification of 31 species of Mammals from the Park including Tiger, Leopard, Wild Dog, Nilgiri Marten, Brown Palm Civet, Brown Mongoose, Stripe Necked Mongoose, Elephant, Gaur, Sambar deer, Barking deer, Mouse deer etc. Chiropteran biodiversity assessment was done in 2019 and 8 species of Bats were identified from the Park. From 2016 onwards, bio-diversity assessment of Birds, Butterflies and Odonates were conducted in collaboration with Travancore Nature History Society (TNHS). Various surveys recorded 122 species of birds, 124 species of butterflies and 19 species of Odonates. Biodiversity assessment of amphibians and reptiles was conducted in 2019 and identified 19 species of Amphibians and 18 species of Reptiles from the Park. Biodiversity assessment of Ants conducted in 2019-2020 period identified 8 species of Ants from the Park. A rapid flora exploration conducted identified 389 species of plants. The Park participated in the all-India Tiger estimation in 2010, 2014, 2018 and the elephant estimation in 2012, 2017.

The presence of Nilgiri Tahr is observed in the grasslands of Idallimotta. The population estimation of Nilgiri Tahr *(Nilgiritragus hyloricus)* is conducted every year by Munnar Wildlife Division with the

participation of the students of the Forestry College, Volunteers and NGOs. The population of Nilgiri Tahr is estimated by Bounded Count Technique proposed by Regier and Robson (1960). The details of Nilgiri Tahr population estimation of the past 4 years at Idallimotta block of the Park is given in **Table 3.8.**

TABLE 3.8: ESTIMATED TAHR POPULATION IN IDDALIMOTTA BLOCK

Year	LCL	N	UPI
2016	16	18	24
2017	6	7	10
2018	12	16	28
2019	18	20	26

LCL – Lower Confidence limit, N-Estimated Number, UPI- Upper Confidence limit.

Research institutions are conducting research programs in the Park. Kerala Forest Research Institute - Peechi, Malabar Botanical Gardan - Calicut, Jawaharlal Nehru Tropical Botanical Garden and Research Institute – Palode, Mahathma Gandhi University - Kottayam, University of Calicut – Thenhipalam and College of Forestry-Vellanikara are some of the institutions conducting research in Anamudi Shola National Park for the past ten years. Details of the research Programs conducted by the institutions are attached in **Annexure 3.5.**

Research has covered various aspects of the Park. The studies include the documentation and biodiversity assessment of floral and faunal species, the ecology and conservation of Shola ecosystem, identification and mapping of Montane Shola-grassland for conservation, ethno-botanical studies of various medicinal plants and the assessment of sustainable practices of eco-tourism etc. The floral diversity along an altitude gradient of Mannavan Shola forest was assessed by Binu and Chandrasekhara, 2015.

3.8.2 TRAINING

Various training, awareness programs and capacity building programs are organised for the staff and local people periodically. These include awareness on forest fire, firefighting techniques, biodiversity assessment, wildlife management, disaster mitigation, habitat improvement, sustainable management of the ecosystem, soil and moisture conservation, first aid, etc.

3.9 ECOSYSTEM, HABITATS AND WILDLIFE CONSERVATION STRATEGIES AND THEIR EVALUATION

The strategy of conservation is primarily focused on the protection of Shola habitat and other native species. Rampant spreading of invasive plantations and fire are the major threats to conservation and habitat maintenance of the Park. Hence conservation strategies give thrust to eco-restoration activities, fire prevention, preservation of animal corridors, preventive measures to spread disease from livestock of the fringe areas, mitigation of human animal conflict, preservation of natural waterholes and construction and maintenance of artificial water sources, regulations on vehicle movement inside the Park, estimation of population of various species, etc. As part of habitat / species monitoring, studies like mapping of vegetation, wildlife health monitoring, documentation of flora and fauna including RET and endemics, population monitoring of selected flora and fauna, mapping of water sources, drainage map, monitoring of burned areas, etc. are undertaken periodically. As part of habitat management, eradication of exotic species, restoration of the eradicated area, gully plugging and desilting of water holes etc. are being done on an ongoing basis.

Controlled burning and such appropriate measures are carried out around plantations and fire gangs are engaged in sensitive areas. The fire protection camps are established at strategic locations and fireline are cleared by the department in fire prone areas. Fire awareness campaigns were organized and necessary firefighting equipment is made available to manage exigencies.

Based on the recent study by Arsumani *et.al,* 2021 grasslands suitable for restoration are classified into four major categories

Category-1. Lightly invaded grasslands (LIG). These are large grasslands that have young (small) invasive trees. This area constitutes areas were these invasive exotic trees are moving in to the Grass lands (height approximately 1m-3m).

Category -2. Sparse mature exotic trees stands with grass cover (SMG). In some areas grass persist underneath with sparse mature exotic trees stands. These areas are also suited for starting restoration initiatives than areas devoid of natural grasss.

Category-3. Isolated exotic trees and sparse saplings in the grasslands (ITG). Isolated but matured exotic trees with isolated exotic saplings in the grasslands.

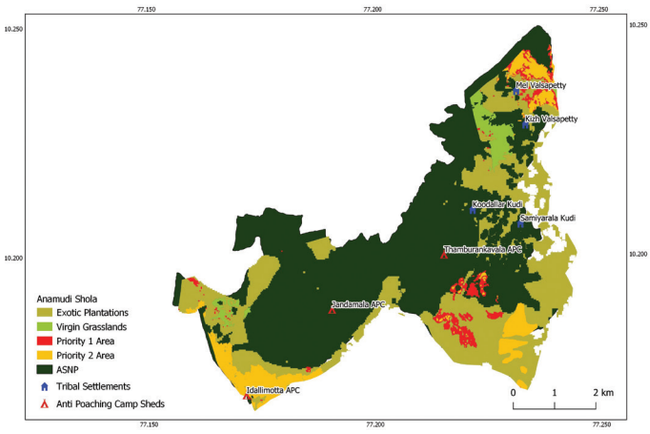
Categoey-4. Fragmented grasslands enveloped by mature exotics. (GET) These are some small Grassland patches, that have been enveloped by exotic trees usually seen in marshes, on hillocks and near streams which had not yet been invaded. These small grasslands also should be of high priority for restoration.

As a comprehensive approach towards restoration, the category one (LIG) and four (GET)are placed under priority one, where with minimum investment and efforts, we can achieve restoration of large areas. Young saplings are easy to remove and this can be achieved with minimum resources.

Priority two included category 2(SMG) and category three (ITG), where matured trees stand with some grass cover underneath and invaded areas with isolated matured exotic trees with isolated young saplings which do not require the large invest compared to starting a restoration programme in a vast matured invasive plants.

In ASNP both priority 1 and priority 2 area exists and these areas are shown in the **figure 3.2**

FIGURE: 3.2: MAP SHOWING ECO-RESTORATION PRIORITY AREAS



Periodical surveys and studies facilitating conservation of flora and fauna is conducted and based on the reports appropriate interventions are being implemented from time to time. Annual maintenance of trek paths is being done for strengthening protection as per the guidelines are issued at various points. Wildlife safety boards and speed breakers are erected at areas of wildlife movement to facilitate safe movement of Wildlife.

3.10 ADMINISTRATIVE SETUP

Anamudi Shola National Park is one of the administrative units under the Assistant Wildlife Warden, Shola National Parks under the Wildlife Warden, Munnar Wildlife Division. There is no separate staff

allotted for the Park. A Section Forest Officer, 4 Beat Forest Officers and a Tribal Watcher are deputed for the administration and management of the Park **(Table 3.9).**

TABLE 3.9. THE DETAILS OF STAFF STRENGTH

Sl No.	Category	Present Staff Strength
1	Assistant Wildlife Warden	1
2	Section Forest Officer	1
3	Beat Forest Officer	4
4	Tribal Watcher	1

(A) EXISTING ANTIPOACHING CAMP SHEDS

At present there are two camp sheds at Thamburankavala and Iddalimotta. They are used by staff and watchers for camping during their field perambulation. Locations of anti-poaching camp sheds are shown in **Figure 3.3**

(B) EXISTING BUILDINGS

The existing buildings under the jurisdiction of the Park include Section Office at Perumala, 2 Staff quarters at Kanthalloor, Checkpost building at Methappu **(Figure 3.4).**

FIGURE 3. 3: EXISTING ANTIPOACHING CAMP SHEDS IN ASNP

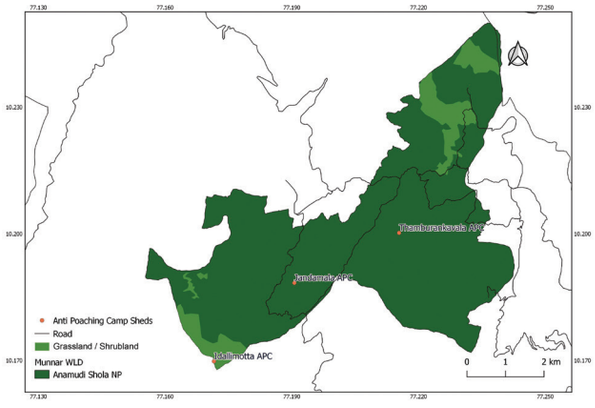
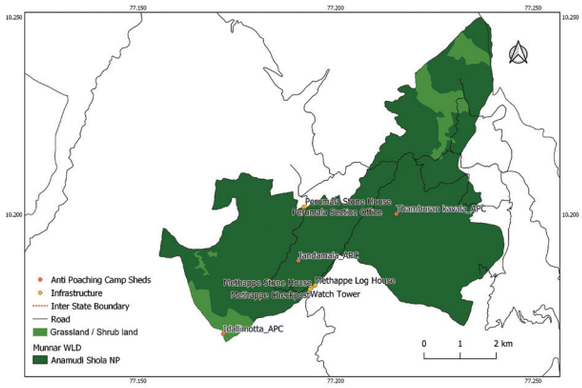


FIGURE 3. 4: INFRASTRUCTURE MAP OF ASNP



(C) ROADS AND TREK PATH

A. ROAD

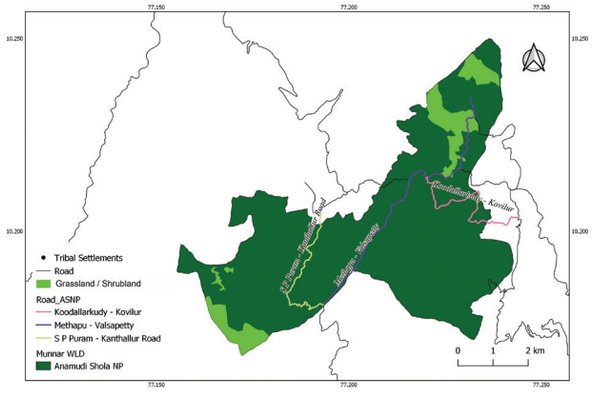
All these roads are fair weather roads. These roads are used by the tribal and the local people for their movement. The increase in the vehicular movement was noticed in the above road on account of development of tourism and increase in number of vehicles in the fringe villages viz, Kanthalloor, Perumala and Keezhanthoor. An Application No. 233 was filed by WWF regarding the construction of road passing through Mannavan Shola Reserve Forest in alleged violation of Forest (Conservation) Act, 1980 and Hon'ble Supreme Court's order dated 12-12-1996. During the hearing of the Application No. 233 filed before the Central Empowered Committee (CEC), it has been brought to the notice of the CEC that the construction / widening of the said road is being undertaken by the State PWD

in violation of the Forest (Conservation) Act, 1980 and Hon'ble Supreme Court's order dated 12-12-1996 and hence the CEC gave direction that the work of construction / widening of the said road is immediately stopped. The CEC report is given as **Annexure 3.6**. After that no developmental work was undertaken in this road. Only some maintenance work was done by the Park management for vehicular movement as part of protection and for the tribal people. Increasing vehicular movement is a potential threat to the wildlife habitat and disturbs the pristine ecosystem. In 2018 restriction to the movement of tourist vehicles through the Park was imposed as per the direction from Field Director (Project Tiger), Kottayam and it is given as **Annexure 3.7.** Now these roads are used only by the tribal people and the local people for movement. Other vehicular movement are strictly prohibited through the Park. The Details of the road passing through the Park was given in the **Table 3.10 & Figure 3.5.**

TABLE 3.10: ROADS PASSING THROUGH THE PARK

SL.NO.	ROAD	STARTING POINT	LAST POINT
1	Sethu Parvathipuram (S.P. Puram) – Kanthalloor road - 6km	10°12'7.35" 77°11'33.01"	10°10'50.21" 77°11'.36.34"
2	Methappu to Valsapetty - 9 km	10°10'50.21" 77°11'36.34"	10°13'46.47" 77°13'57.78"
3	Koodallarkudy to Kovilloor - 1.5 km	10°12'35.91" 77°13'18.40"	10°12'7.90" 77°14'8.52"

FIGURE 3. 5: ROADS OF ASNP



B. TREK PATHS

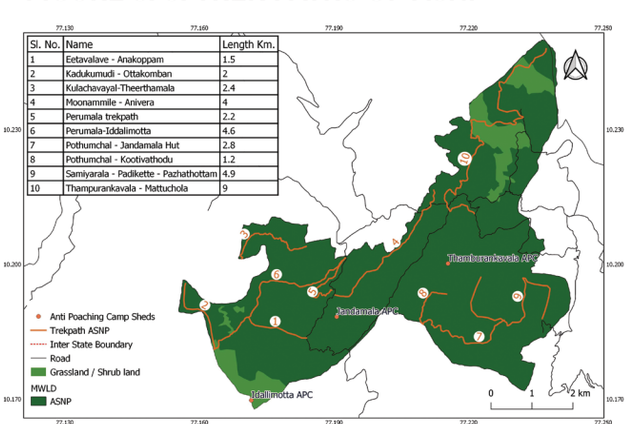
A total length of 34.6 km of trek paths exists in the PA by the end of the previous plan period. These trek paths are used for patrolling, perambulation and protection purposes **(Table 3.11 and Figure 3.6).**

TABLE 3.11: LIST OF TREK PATHS IN ASNP

Sl. No.	Name	Length Km.	GPS points	
			Starting Point	Ending Point
1	Eetavalave - Anakoppam	1.5	N10°11'1.02" E77°11'1.70"	N10°11'17.51" E77°10'15.47"
2	Kadukumudi - Ottakomban	2	N10°10'52.27" E77°9'48.78"	N10°11'44.67" E77°9'25.02"

3	Kulachavayal - Theerthamala	2.4	N10°12'14.77" E77°11'1.55"	N10°12'4.96" E77°10'9.88"
4	Moonammile - Anivera	4	N10°11'36.15" E77°11'24.71"	N10°13'0.02" E77°12'43.75"
5	Perumala trekpath	2.2	N10°12'5.79" E77°11'32.93"	N10°11'39.53" E77°11'21.95"
6	Perumala - Iddalimotta	4.6	N10°12'5.39" E77°11'32.66"	N10°10'54.62" E77° 9'48.20"
7	Pothumchal - Jandamala Hut	2.8	N10°11'13.08" E77°12'35.60"	N10°11'16.04" E77°13'39.97"
8	Pothumchal - Kootivathodu	1.2	N10°11'36.53" E77°12'53.98"	N10°11'13.18" E77°12'34.46"
9	Samiyarala - Padikette - Pazhathottam	4.9	N10°11'17.17" E77°14'10.69"	N10°11'49.96" E77°13'21.67"
10	Thampurankavala - Mattuchola	9	N10°12'41.72" E77°13'16.42"	N10°14'54.71" E77°14'14.74"
	TOTAL	**34.6**		

FIGURE 3. 6: TREK PATHS OF ASNP



3.11 COMMUNICATION

The Park is 40 km away from Munnar town. Various mobile networks are available in the Protected Aera, but the signal strength is very poor especially in interior forest areas. The only existing communication facility in the Park is wireless radio and is used by the field staff for patrolling purpose. The wireless control room is functioning at Bendhar wireless station. The office of the Wildlife Warden, Munnar Wildlife Division is well connected with various modes of communication such as telephone, wireless sets, mobile phones, internet etc.

Official Phone Nos.

1) Assistant Wildlife Warden,
Shola National Parks Range: 8547603258

2) Anamudi Shola,
Section Forest Officer: 8547603269

3.12 SUMMARY OF THREATS

a. Exotic and Invasive species: The presence of old plantations of black wattle and eucalyptus and their invasion into the natural vegetation is a major threat to the Park. Also, the invasion of exotics like eupatorium, solanum, lantana and asclepias are adversely affecting the natural vegetation.

The notified boundaries of the National Park also encompass plantations of the following categories.

Eucalyptus Plantation	365.995 ha
Wattle Plantation	455.60 ha
Pine Plantation	23.83 ha
Miscellaneous	10.00 ha
Total	**855.425 ha**

b. Forest Fire: One of the major threats to the Park is forest fire, due to the presence of eucalyptus and black wattle plantation in the fringe areas of the National Park. Due to the volatile nature of these plantations during dry season and large-scale accumulation of biomass inside these plantations are highly vulnerable to fire and when forest fire occur it is very difficult to control. Highly fire prone areas in the Park includes Pazhathottam, Jandamala, Idallimotta and Bepoormala.

c. Ganja cultivation: Many potential ganja cultivation areas are present inside the National Park. Because of the frequent raids, interior camping and perambulation no ganja cases have been reported from the Park in the past ten years. Ganja cultivation prone areas are Mattuchola, Tholamala and Idalimotta.

d. NWFP collection: The Park is rich in Non-Wood Forest Produces. People are using NWFP mainly for household purpose and sale. The unscientific collection practices of NWFP are likely to cause depletion of their sources which in turn cause damage to the ecosystem.

e. Encroachment: There are chances for encroachments near the boundaries since boundary consolidation is yet to be done in most of the fringe areas of the National Park.

f. Human–animal conflict: The indigenous tribes in the Park and the communities along the fringe areas are doing various types of cultivation in and around the Park. Winter vegetables and fruits are cultivated in this region. The above cultivation attracts wildlife leading to human wildlife conflict. Elephants, gaur, wild boar, bonnet macaque, sambar deer etc. are frequently entering in the cultivated areas and this leads to conflicts.

g. Feral dogs: The presence of feral dogs in the fringes of the Park is a threat to wildlife.

h. Wildlife diseases: Chances for disease outbreak in the Park is high due to the presence of livestock in the tribal colonies inside the Park and human settlements in the fringe areas.

i. Inadequate staff: One of the major constraints in the management of the Park is inadequate man power. Manpower is deployed at present for protection, supervision of developmental activities, visitor management and monitoring. Absence of specific manpower for protection activities is likely to result in shifting of responsibility, non accountability etc. Details of present staff strength given in **Table 3.9.**

CHAPTER 4

The Protected Aera and the Interface Land Use Situation

4.1 THE EXISTING SITUATION IN THE ZONE OF INFLUENCE

There are three Muthuvan Tribal settlements viz. Koodallarkudi, Valsapettykudi and Swamiyaralakudi in the North-Eastern side of the National Park. Apart from these settlements, one Muthuvan settlement known as Kulachivayalkudi is also present at the North-Western boundary of the Park. The Valsapettykudi also know as Parassukadavukudi consists of four small settlements namely Mel-Valsapetty, Eda-Valsapetty, Keezh-Valsapetty and Vayaltharakudi. Three other settlements, Perumala, Puthur and Kanthalloor are on the North and North-Western side of the Park boundary in the fringe area. The labour colony of Chittavurrai Division of KDHP (Pvt) Ltd. is along the South-Western boundary of the Park.

The individual rights as per the Forest Rights Act have been awarded to the tribal population (Swamiyaralakudi-75, Koodalarkudi-64 & Valsapettykudi-85) and the community resource rights needs to be settled in this plan period. A number of families have not yet submitted the application for individual rights, and necessary step in this regard is to be taken in the current plan period. People from the tribal settlements are primarily engaged in agricultural practices, allied works, animal husbandry, collection of NWFP, protection activities of the Park, etc. for their livelihood. The most common crops cultivated in these areas are potatoes, beans, cabbage, carrot, garlic, lemon grass, etc. A number of people are employed as casual labourers in farming and plantations works at Silanthiyar, Pazhathottam and Koviloor areas.

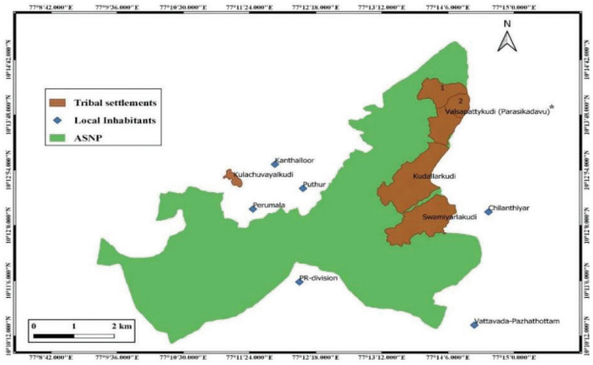
In addition to winter vegetables, lemon grass and Panjapullu (*Eleusine coracana*) is cultivated by the tribes for livelihood. Migratory nature of the lemon grass cultivation along the slopes of hillocks disturbs the natural vegetation, loosens the soil of the area and enhances soil erosion. Thatching grass is collected for the roofing purpose of huts. Small poles are also collected for housing, cattle sheds, fencing, support poles for agricultural crops etc.

The local inhabitants (within and outside the Park) depend on the streams to meet their water requirement for drinking as well as irrigation purposes. Muthuvan tribes depend on the Park for NWFP collection especially badraksham and honey. The older generations of Muthuvans were engaged as labourers / care takers of the ganja cultivation in Kambakallu and Kadavari areas. With the formation of Eco-Development Committees in these settlements, stringent rules, regular patrolling, raids, constant surveillance etc. brought in considerable changes in suppression of such illegal practices. The strategy of keeping the ex-workers engaged in ganja cultivation are now actively involved in forest management and protection activities..

4.1.1 THE LOCATION, EXTENT, BOUNDARIES AND NATURAL ATTRIBUTES OF THE ZI.

The Zone of influence is the 3 tribal settlements inside the Park, tribal and other settlements and habitations of the fringe areas and neighboring villages (5.51 Km2). The tribal settlements inside the Park are Swamiyarlakudi, Koodallarkudi and Valsapettykudi (Parassukadavukudi) on North-Eastern side of National Park. The Valsapettykudi consists of four small settlements namely Mel-Valsapetty, Eda-Valsapetty, Keezh-Valsapetty and Vayaltharakudi. Kulachivayalkudi is located on fringe area in the Northern boundary of the Park. Perumala, Puthur, Kanthalloor, PR-division, Silanthiyar and Vattavada, Pazhathottam are the other settlements and colonies included in the Zone of Influence. Muthuvans are cultivating winter vegetable crops in the hillocks and slopes. Muthuvan tribes have fair degree of self-sufficiency in terms of livelihood and utilisation of resources around them. A number of tribals are employed as daily waged labourers in the agricultural and plantation areas of Silanthiyar, Pazhathottam and Koviloor. The map showing the Zone of Influence of ASNP is given in **Figure 4.1.**

FIGURE 4.1: MAP OF SETTLEMENTS IN AND OUT OF NATIONAL PARK



4.1.2 VILLAGES INSIDE AND OUTSIDE THE PA. ETHNIC IDENTITIES, TRADITIONS, CUSTOMS, RELATIONSHIP BETWEEN DISTINCT GROUPS OF PEOPLE, RELATIONSHIP WITH RESOURCES, HABITATS AND AREA.

The tribal settlements located inside and outside the National Park are of Muthuvan community. Muthuvan tribes have a distinct social organization, strong community leadership, division of labour, adherence to traditional culture and way of life. Muthuvans are forest dwelling scheduled tribe community and constitute one of the largest groups of tribes of South India. They are mostly agriculturists and prefer a secluded life, fostering their own culture, traditions, livelihood patterns, values, customs, medicine, gender relations, marriage, food habits, worship, etc. centered around the forest environment, seasons and resources. However, their dietary habits have changed substantially over the years. Muthuvan tribes are independent and prefer secluded life in settlements on hill areas with minimum contact with outside world. Women folk of these communities are confined to household work, agriculture and allied activities. Even though the women were deeply inclined to follow the customs and practices rigidly and limit their contact with outside world and other menfolk in the previous years. Increased visibility of women in social process is observable in the recent years. There is attitudinal change among the women in terms of their openness to seek health care, avail the benefits of government schemes, educate the children, presence in the market places etc. Betel / tobacco use, alcoholism, early marriage, school dropout etc. are common among adolescence. The custom of social or gender distancing of adolescents boys, young adults and bachelors, in the form of staying in a common place called 'Sathram' is prominent in the Muthuvan tribal settlements. Similarly the tribal communities have a secluded common shelter for menstruating women and girls, known as 'Valayamapura'. Muthuvan tribes speak a local tribal dialect of Tamil. Younger generation is given basic education and increasingly deriving the benefits of various schemes such as free education, stay in hostels, scholarships, etc.

Due to declaration of the forest tracts as Protected Areas and due to the ban imposed on hunting and shifting cultivation for several generations, Muthuvans were forced to abandon their traditional modes of subsistence. These Muthuvan tribes of the Park depends on PA mainly for livelihood, water, firewood, branches, leaves and grasses for housing, rearing cattle, collection of NWFP like Wild honey, Thippali, Badhraksham, Kattupadavalam etc.

The forest areas around the settlements of Muthuvan Tribes are largely benefited out of the implementation of the Forest Rights Act. Otherwise, the migratory nature of their cultivation, the practices of clearing of grassland for preparation of soil along the hillocks for cultivation, excessive dependence on forests, unregulated extraction of forest produces etc. would have made a serious adverse impact on ecosystem and wildlife habitat.

TABLE 4.1: POPULATION DETAILS OF THE SETTLEMENTS INSIDE THE NATIONAL PARK

Sl No.	Tribal Settlement	No. of Families
1	Koodalar	101
2	Swamiyarala	126
3	Valsapetty	114

4.1.3. THE STATE OF THE PEOPLE'S ECONOMY, VOCATIONS, LAND USE, USE OF FOREST AND NON-FOREST BASED NATURAL RESOURCES BY PEOPLE AND SEASONAL PATTERNS.

In general the economic situations of the Muthuvan tribes are sound. They generate income for sustenance by sale of their agricultural products carrot, cabbage, cauli flower, garlic, butter beans, lemon grass oil, NWFP, cattle etc. in the local markets. They are dependent on the public distribution system and local market for rice, provisions and consumer products, clothing etc. Health issues and ailments are less common among adult population. For delivery, child health issues etc. nearby Government health facilities are made use of. Most of the huts were small, made in the traditional ways using locally available clay and other materials with tiled or tin roof sheets. The housing and other constructions were earlier done using eco-friendly indigenous material available, such as clay, sticks, branches of trees, grass, vines etc. But there is a major shift in their housing pattern, construction material used etc. during the last 10 years. The houses, sanitation facilities and other amenities built under various government schemes / projects use cement blocks and other building material procured from outside. The pathways, trek paths and roads to settlements are maintained from time to time with zero / minimum impact on the environment.

These tribes are mainly practicing contour cultivation and with seasonal rotation of crop in the areas assigned to them under the Forest Rights Act. NWFP such as wild honey, thippali, bhadraksham, kattupadavalam etc. are collected seasonally and from permitted areas near to their settlement. They are collecting firewood for their bonafide household purpose. Grass, leaves, dried twigs / branches of eucalyptus trees and black wattle etc. are collected for housing, fencing, agricultural operations etc. The forest dependent communities solely depend on water from Shola for drinking, household, sanitation and agricultural purposes round the year.

4.1.4 IMPLICATIONS OF LAND USE AND RESOURCE DEPENDENCY FOR THE CONSERVATION OF PA.

Land use changes in Western Ghats over the last century caused by agriculture expansion, conversion to plantations and infrastructural projects have resulted in loss of forest and grassland (Kumar 1993, Jha et al 2000, Khan et al., 1997). Considerable areas of forest have been converted to plantations in the Western Ghats, particularly of tea, coffee, and eucalyptus and different species of acacia. The area under plantations is large and growing. Tea plantations in the South Indian states increased by 17.7% in the period 1987-1998 from 74,765 ha to 87,993 ha (Tea Board 2002). Large areas of eucalyptus and acacia plantations also occur with tea as they are used as fuelwood for tea-curing in the factories. Extensive eucalyptus plantations have also been established by large tea companies and private farmers. The eucalyptus plantations raised and managed by corporate tea companies are used exclusively for the fuel requirements of tea factories and labour lanes. The private eucalyptus plantations in the high-altitude but low-rainfall areas of Vattavada and Kanthalloor are reportedly causing acute water shortage in the valley bottoms. There is also a recent tendency to convert the vegetable farms to eucalyptus plantations which leads to disruption of local livelihoods, cultural drift, impoverishment of communities as well as ecosystem malfunctioning. Hindustan News Print Ltd. (HNL) and Kerala Forest Development Corporation (KFDC) have also established short rotation eucalyptus plantations for industrial raw material requirements on land taken on concessions from the Forest Department. Although tea gardens (14,000 ha) occupy one of the major cash crops in the landscape it retains several interspersed forest fragments (largely Shola) in varying size that act as corridor or sheltered habitat for many faunal components of the biological diversity especially the lower groups of the landscape. The management input in the tea garden also makes negative impact to the biological richness of the area. Cardamom plantation (around 42,000 ha) being the biggest employer of the Munnar Landscape also has pivotal position in conservation and management of biological diversity in the area. Being cultivated in the medium elevation tropical evergreen forests

as a shade loving crop, it provides habitat for both terrestrial and arboreal fauna and a wide range of critical plant species found in the region. The management of cardamom estates has been highly evolved towards high yielding in the recent decades due to its economic gains that made considerable impact on naturally growing trees and the physical environment. As a result, large scale input in the form of pesticides and chemicals and fast growing tree species as shade for the growing crop has been employed that impoverished the biological diversity of the area.

Tribes are mainly practicing contour cultivation with seasonal rotation of crop in the areas assigned to them under the Forest Rights Act. Firewood, leaves, dried twigs / branches of eucalyptus trees and black wattle etc. are collected from eco-restoration areas with zero impact. These in turn assist in the removal of accumulated biomass in the invasive plantation area and reduce the chances of spreading of fire. Members of the tribal communities are engaged in the protection, conservation, tourism operations etc. Annual desilting of check dams, preservation of waterholes, maintenance of trek paths and firelines, fire protection, eco-restoration works, etc. are done with the participation of EDC members. NWFP is collected seasonally from permitted areas. A standardized protocol for the collection of NWFP shall be made and necessary training to be imparted to the stakeholders. The forest dependent communities inside the Park and fringe areas solely depend on water from the Shola for drinking, household, sanitation and agricultural purposes round the year. Grass lands around tribal settlements are used for grazing cattle.

4.1.5 PA MANAGEMENT PRACTICES AND THEIR IMPLICATION FOR PEOPLE

On account of the ban imposed on encroachment of grasslands and clearing of slopes and hillocks other than the designated area allotted under the Forest Rights Act the cultivation is confined to limited areas. Muthuvans were forced to abandon their traditional modes of shifting cultivation and appropriation of areas of their choice. Regulations imposed for sustainable collection of NWFP also limited the scope of unscientific collection / extraction. Restrictions are in core areas especially, regulation of free movement, collection of NWFP, cattle grazing, collection of firewood etc. limited to the sphere of activities to the eco-restoration areas. Even though all these limited the sphere of activities of people in the tribal settlements, the alternate livelihood options in protection, conservation, eco-restoration and tourism activities keep them motivated to participate in the activities of the Park. Compensation for crop damage due to wildlife, permissions for civil works, movement of goods and services to the tribal settlement through the checking stations etc. is allowed. EDCs provide avenues for empowerment, alternate livelihood options, income generation, marketing / sale of NWFP, and other welfare measures.

4.2 THE DEVELOPMENT PROGRAMS AND CONSERVATION ISSUES

Four Eco-Development Committees are functional at ASNP. These are 3 Tribal EDCs, Koodallarkudi EDC, Valsapettykudi EDC and Swamiyaralakudi EDC and a general EDC known as Anamudi Shola Trekkers EDC. The Park provides employment opportunities to the local people of tribal settlements and fringe areas around the National Park. They are deployed in various Park management activities such as visitor's management, fire management activities, eco-restoration programs, and other forest protection programme. The tribal EDCs are constituted for livelihood promotion and empowerment of tribal population. Anamudi Forest Development Agency (AFDA) is providing Community Development Fund (CDF) to all the tribal EDC annually, for the developmental interventions in tribal communities and it is coordinated and implemented by EDC. Activities of EDCs are included in the micro plan. The micro plan has to be revised in every five years and it has to be prepared after conducting the detailed Participatory Rural Appraisal (PRA) exercise.

4.2.1 AN EVALUATION OF GOVERNMENT AND NON-GOVERNMENT AGENCY ACTIVITIES PROGRAMS FOR DEVELOPMENT, IMPLICATION FOR THE PA, PEOPLE AND THE ZI

Various programs, activities and projects are implemented by different Government agencies especially Tribal Department, Agriculture Department and LSGD in all settlements inside and outside the Park. Housing, sanitation and infrastructure development in tribal communities, maintenance of roads to settlements, health and welfare programs, distribution of ration and supplies in exigencies, promotion of basic education, livestock immunization programme, etc. are conducted with the help of various line departments from time to time. Interventions in association with local Police and Excise Department help to prevent illegal activities. Maintenance of roads to Swamiyaralakudi and Koodallarkudi, establishment of social study centre and library at Koodallaarkudi, provision for water supply to Koodallar area, construction of Valaymapura, (shelter for women) at Koodallarkudi etc. are some of the developmental interventions done by the other department in these areas.

The government machinery alone cannot effectively cope-up with the task of development until supported by the other agencies and stake holders. Developmental interventions in housing, amenities, poverty alleviation, animal welfare, heath, education, livelihood, women empowerment etc. improve the standard of living of tribes and lead to social and economic empowerment. Such programs helps to maintain good rapport with the stake holders and helps to keep them connected with forest conservation, protection and eco-restoration.

4.2.2 THE INTERPLAY OF MARKET FORCES AND THEIR IMPACT ON THE SUBSISTENCE ECONOMY OF THE LOCAL PEOPLE

The local merchants, tourism operators, shop owners of Kovilloor and Vattavada offers marketing solutions for the agricultural products and NWFP collected by Tribes. Alcoholism is common among menfolk. Local merchants lend money and take the products. The changes in the dietary pattern of tribal population are triggering the food secuirty and economic sustenance of tribal communities. They cultivate sufficient grain crops, millets and vegetables to meet their domestic needs throughout the year. But the tribes usually sell all their high quality agricultural products in the local market for low prices and buy food grains, provisions and consumer products from local shops at high prices for their domestic consumption or by borrowing from merchants and moneylenders. These tribes are compelled to depend on merchants to tide them over the growing need for alcohol, cash requirements, or buying clothes, mobile phones etc. Thus, the tribes often falls into debt traps and are continuously exploited by the local market forces. The long exploitative relationship of the debt trap system still continues unabated.

To reduce the resource dependency of the people on Park, optimization of the income from agricultural products and NWFP is necessary. Avenues for increasing income from agricultural products by offering reasonable price, eliminating the middle men, providing direct marketing facilities, opening up of facilities for direct market through EDCs, eco shops, mobility support to the markets etc. are required for the subsistence economy of the forest dependent local communities and strengthen the market. Presently an agricultural produce marketing centre has been functioning at Vattavada village by the Agriculture Department of Kerala. The project aims to procure vegetables from the farmers and to market them, thereby farmers are getting a fair price for the produce. But the mobility support for transport of the agricultural products to such collection points is yet another issue to be tackled.

4.2.3 A SUMMARY OF PROBLEMS FACED BY PEOPLE THAT AFFECT THE MANAGEMENT OF THE PA & THE ZI.

Human animal conflict is one of the problems faced by the people living within and close proximity of the Park. Though timely compensation is paid to the victims, stringent implementation of laws and regulations for protection of wildlife create hostility towards wildlife. Frequent checking, patrolling, surveillance etc. create general apathy towards forest conservation. The annoyance in implementing rules for the sustainable management of the Park is often translated to the form of setting fire to forest and suppression of information on illicit practices etc. which in turn causes far reaching consequences. Targeted interventions in the tribal settlements and surrounding villages to sensitize on the concepts of "peaceful co-existence", "sustainable utilisation of resources" and "living harmony with wildlife" etc. is the need of the hour to bring about attitudinal change towards forest conservation.

Increase in the tourism, increase in the human habitation and cattle populations, cultivation practices etc. in turn increase pressure on forests. Livelihood and socio-economic conditions such as sustenance agriculture, cattle rearing, tourism etc. depend on water and other ecosystem services of the PA. Free availability of firewood reduces the expenditure on sources of energy for cooking, and domestic purpose. Poles from the forest plantations are used for making cattle sheds, fences, dwelling houses however increased trend of concrete houses is commonly seen in the recent years. People from the fringe areas are engaged as watchers for forest protection and allied works.

PART II
THE PROPOSED MANAGEMENT

CHAPTER 5

Vision, Objectives, Issues and Problems

5.1. THE VISION

Conservation of the fragile Shola-grassland ecosystem to ensure biological diversity, ecological sustainability, livelihood security and ecological services.

5.2. OBJECTIVES OF MANAGEMENT

1. To conserve the rich biological diversity in the fragile and unique Shola-grassland ecosystem.
2. To restore and maintain the unique Shola-grassland ecosystem and the landscape.
3. To maintain and improve the watersheds of the National Park.
4. To promote environmental conservation and awareness.
5. To facilitate eco-tourism activities for income generation and livelihood promotion.
6. To strengthen People-PA interface.

5.3. PROBLEMS IN ACHIEVING OBJECTIVES AND STRATEGIES TO OVERCOME

Objective 1: To conserve the rich biological diversity in the fragile and unique Shola-grassland ecosystem.

Sl.No.	Constraints	Strategies
1.	Inadequate data on the extent of vegetation types.	1. Map the vegetation, types, distribution etc in association with research institutions. 2. Mapping of Endemic species, Critical Wildlife Habitat etc.
2.	Inconsistencies in the extent in the field and in the notification.	1. Steps have to be taken to correct the extent of area in the notification. 2. Survey the Park and demarcating the Park with cairns / pillars.
3.	Fire Management.	1. Create zonation map of fire prone areas based on the history. 2. Appropriate revision in the present fire management plan in accordance with the present conditions. 3. Provision for 4 fire watch camps at Beppurmala, Iddalimotta, Mattuchola and Pazhathottam. 4. A participatory fire management plan by involving all the stakeholders such as KDHP, Private plantations, indigenous people from Kulachivayalkudi, Kanthalloor Village and Pazhathottam Village.

		5. Periodical forest fire awareness camps in villages near to ASNP. 6. Fire watch towers at fire prone areas of Iddalimotta, Pazhathottam, Noolumala and Thampurankavala. 7. Ensure adequate high efficiency modern firefighting equipment suitable for the terrain. Provide fireproof suite and safety kits for all staff and watchers. 8. Establishment and periodical maintenance of Firebreaks inside the plantation area to control spreading of fire. 9. Establishment and timely maintenance of trek paths to inaccessible and difficult fire prone areas. 10. Width of the firelines / strips should be site specific and to be marked using GPS. 11. Firebreaks, strips and patch wise controlled burning are proposed as fire protection tool. 12. Interstate boundary firelines should be double the width. 13. Ensure the availability of water in the critical fire prone area.
4.	Inadequate wildlife health monitoring mechanism.	1. Disease surveillance. 2. Wildlife surveys to monitor the biodiversity. 3. Detection of wildlife health by carcass examination, faecal matters etc. observing wildlife with symptoms of diseases. 4. Monitoring changes in animal behaviour, eating patterns, treatment of infected / sick animals.

		5. Steps to prohibit environmental stress, pollutants and other harmful microorganisms in the PA. 6. Procurement of gadgets for rescue and rehabilitation of wildlife, especially snakes and other entrapped wild animals. 7. Measures to control the population of domestic dogs and feral dogs in and around the Park. 8. To keep records regarding the instances of attack of feral dogs on wildlife. 9. To safeguard spreading of diseases to wildlife, a collaborative preventive immunization and awareness programs recommended by KDHP in the peripheral domestic animals of the PA and ensure the immunization of domestic animals with the KDHP veterinary Department on an ongoing basis. 10. Implement regular wildlife health monitoring. 11. Surveillance / tracking system for monitoring the sick and ailing animals. 12. Training / awareness to staff / watchers for identification and management of health issues in wildlife. 13. Periodic vaccination of all domesticated animals and livestock in the communities and fringe areas. 14. Periodical programs to raise awareness level to improve public participation and coverage, complete immunisation with the help of the Veterinary Department. 15. Monitoring of cattle population and promotion of stall feeding.

5.	Feral dogs.	1. Estimation of population of domestic dogs and feral dogs in and around the PA. 2. Maintenance of records on the attack of feral dogs on wildlife and take necessary measures for prevention. 3. Adopt animal birth control measures in association with Animal Husbandry Dept.
6.	Incomplete database on flora and fauna including threatened taxa.	1. Field manual of flora and fauna especially lower group animals present in the Park should be prepared. 2. Compilation and systematic maintenance of all research reports at the office of the Wildlife Warden, Munnar. 3. Track the movement of large mammals such as elephants, gaurs etc. inside the PA. 4. Conduct annual survey of Birds, Butterflies, Reptiles, Amphibians, Odonates etc. 5. Study the population and habitat utilization of Nilgiri Marten in the PA. 6. Documentation of the floral diversity in the PA. 7. Document the traditional knowledge and practices of indigenous community. 8. Training to staff on identification and habitat maintenance of threatened flora and fauna.
7.	Insufficient infrastructure including communication, arms, vehicles, equipment & accommodation.	1. Construction of forest station at Perumala and section office at Methappu. 2. Four new camp sheds at KDH para, Pazhathottam, Beppurmala and Mattuchola.

		3. Construction of a wireless station at Idalimotta and a main set at Perumala and procurement and upkeep of sufficient number of walkie-talkies. 4. Periodical upkeep and maintenance of arms. 5. Ensure the availability of sufficient number of vehicles appropriate to the terrain, timely maintenance and upkeep. 6. Ensure the availability of necessary equipment, such as binoculars, cameras, chain saw, torches etc. 7. Annual maintenance of buildings and facilities and construction of additional buildings in need.
8.	Unscientific NWFP collection and, lack of database.	1. Evolve scientific / sustainable collection methods. 2. A study on the threshold capacity of the NWFP collection, measures to ensure sustainability. 3. Define zones of collection and frame rules for sustainable collection. 4. Proper documentation of NWFP collected from the PA. 5. Record the NWFP collection from location, seasonality, volume etc. 6. Training to stake holders on scientific collection of NWFP.
9.	Insufficient manpower.	1. Construction of forest station at Perumala and section office at Methappu with a Deputy Range Forest Officer, and 4 Beat Forest Officers.
10.	Inadequate amenities and equipment for staff.	1. Essential furniture, lifesaving equipment, warm cloths, jackets, rain coats, sleeping bags, trekking boots, GPS and search lights etc. for the protection activities.

11.	Presence of forest road through Mannavan Shola.	1. Close the S.P. Puram – Kanthalloor road for general public for which the Central Empowered Committee issued a stop order to the road development work initiated by the PWD authorities. 2. Movement of tribes and locals are only permitted. 3. Record keeping on the movement of vehicles and checking of all the vehicles passing though the road.
12.	Presence and rampant spreading of invasive / exotic plantation.	1. Conduct a detailed study and prepare a master plan for removal of invasive species in successive phases. 2. Prepare a check list of exotic and invasive species present in and around the National Park. 3. Identification / exploration on the the scope of making value addition products from invasive plantations. 4. Legal hurdle in the commercial utilization of invasive plantations inside the PA should be tackled. 5. Design / procure appropriate machines and tools for cost effective and easy removal of wattle seedlings. 6. Study and evolve appropriate strategies for the feasible, viable removal of biomass from wattle eradicated areas to prevent fire.
13	Poaching & Illicit felling.	1. Establishment of 4 anti-poaching camp sheds at KDH Para, Beppurmala, Pazhathottam and Mattuchola. 2. Strengthen intelligence network. 3. Capacity building to staff in intelligence gathering, identification, seizure, investigation of wildlife offence, acts & rules etc.

		4. Regular upkeep and maintenance of trek paths and ensure regular perambulation by staff.
14.	Inadequate information on judicious distribution of water sources for wildlife.	1. Scientific analysis of necessity to be ascertained before the construction of new large check dams inside the PA. 2. Maintain the present check dams in the PA. 3. Increase the storage capacity of the existing water holes. 4. Assessment of the demand and distribution of water sources for wildlife / fire protection / forest dependent communities. Take appropriate measures to balance the demand and availability ensuring sustainability.
15.	Legal protection for adjoining Reserved forests.	1. Thirthalar proposed reserve of Kanthalloor Range and Iddalimotta of Devikulam Range may be added to the Park.
16.	Zonation.	1. Conversion of Eco-restoration zone into Core zone after the eco-restoration programme. 2. Selected areas of Buffer zone to be designated as Tourism zone. 3. Boundaries of various zones must be included in the Management Plan. 4. A feasibility study for including additional area from adjoining reserve forest and notifying the areas with settlements within the National Park as Wildlife Sanctuary.

OBJECTIVE 2: To restore and maintain the unique Shola-grassland ecosystem and the landscape.

Sl.No.	Constraints	Strategies
1.	Inadequate information on the extent of invasive / exotic species.	1. Conduct a detailed study on the extent of invasive / exotic species present inside the Park. 2. Prepare a map of extent of category wise invasive species occupied by the area.
2.	Presence of large tracts of plantations of exotic species requiring eco-restoration.	1. Plan for the eco-restoration of the Park is detailed in 6.3.2.1. 2. Permit the indigenous people to collect the dry biomass of invasive species like eucalyptus and wattle for their bonafide use. 3. Monitoring, scientific documentation, and mapping of the eco-restoration area. 4. Initiate and proceed with the eco-restoration activities from barely affected area to highly affected area. 5. Identify the grass species suitable for eco-restoration and establish a grass species nursery. 6. Establish a permanent plot for monitoring succession and eco-restoration. 7. Scientific study on soil erosion in the eco-restoration and take necessary measures for the mitigation. 8. Collaborate with NGOs in eco-restoration programme of the Park. 9. A landscape approach for eco-restoration activities by involving the Munnar Territorial Division. 10. Formation of an EDC exclusively for eco-restoration for maintaining continuity and community participation in the restoration programs.

OBJECTIVE 3: To maintain and improve the watersheds of the National Park.

Sl.No.	Constraints	Strategies
1.	Inadequate data on hydrology of the PA.	1. Establish an automatic weather station at an appropriate location. 2. Implement a mechanism for site specific weather data collection.
2.	Conservation of water within and outside the Park.	1. Construct two new check dams at Chengulam and Marvenchola. 2. Annual desilting is not recommended for check dams and water holes. Desilting is to be done depending on the volume of silt accumulation and its impact, preferably at long intervals. 3. Annual monitoring of soil / clay accumulation in the check dams and water holes is recommended. 4. Monthly monitoring and recording of the water level in the check dams and waterholes. 5. Earthen dams are recommended instead of concrete check dams.

OBJECTIVE 4: To promote environmental conservation awareness.

Sl.No.	Constraints	Strategies
1.	Insufficient infrastructure.	1. A nature education centre at Perumala. 2. Centralized information centers at division level recommended, at Munnar and Marayoor.
2.	Shortage of resource persons.	1. Appoint a Nature education officer through AFDA. 2. Capacity building training to staff. 3. Invite experts / volunteers with proficiency in different languages as resource persons. 4. Revise the rate of honorarium for resource persons.
3.	Educational materials for different target groups like students, tourists, media persons, politicians etc.	1. Documentaries, leaflets, pamphlets, interactive audio visual systems, books, charts and maps etc. for catering to the educational needs of various age groups with multilingual content.
4.	Insufficient awareness campaigns.	1. Interpretation center and dormitory for the nature camp at Perumala for conducting nature education programs.
5.	Lack of adequate and updated signages.	1. Periodical upkeep of eco-friendly signage. 2. Design signage unique to the Park in different languages.

7. OBJECTIVES 5: To facilitate eco-tourism activities for income generation and livelihood promotion.

Sl.No.	Constraints	Strategies
1.	Insufficient human resources.	1. Engaging trained resource personnel for managing eco-tourism. 2. Capacity building of watchers, for recording animal sightings, identifying indirect evidences and function as guides. 3. Appointment of eco-tourism manager for coordinating eco-tourism program.
2.	Inadequate awareness of stakeholders.	1. Periodical training to staff and EDC members on identification of flora and fauna, wildlife monitoring, firefighting, first aid and tourism management, public relations, etc. 2. Awareness programme in local communities. 3. To bridge the skill gap and professional expertise and improve species literacy, biodiversity applications assisted by modern technology is recommended.
3.	Insufficient equipment.	1. Purchase of binoculars by AFDA and provide it on rent to the tourist. 2. Provision for periodical maintenance, upkeep, procurement of advanced equipment.
4.	Waste accumulation and lack of proper plastic waste management system.	1. A scientific waste management plan for the National Park to be prepared and implemented.

5.	Responsible Tourism.	1. Provision for trekking programme to Perumala and Methappu. 2. Distribution of leaflets, pamphlets, notices, information boards at strategic locations. 3. To ensure stakeholder participation in tourism. 4. Alternate income generation to community through farm tourism and sale of value added products.
6.	Lack of co-ordination with local tourism initiatives/ tour operators.	1. Revenue sharing / subsidized charges for tour operators promoting eco-tourism / eco-shop products etc. 2. Formulation of appropriate mechanism in consultation with AFDA.
7.	Insufficient fund to meet the operating cost.	1. Optimal use of existing tourism infrastructure for maximizing the output and revenue.

OBJECTIVE 6: To strengthen People-PA interface.

Sl.No.	Constraints	Strategies
1.	Human-Wildlife Conflict.	1. Maintenance of existing solar fencing and EPTs and construction of new in appropriate places. 2. Timely payment of compensation. 3. Institution of crop insurance. 4. Appropriate habitat improvement programs within the Park. 5. Eco-restoration of plantations inside the PA.
2.	Lack of information on the extent of conflict.	1. Track the movements of wildlife. 2. Record and document the wildlife conflict.
3.	Inadequate coverage of eco-development programme.	1. Formation of EDCs of communities at Kulachivayal and fringe areas of park in Kanthalloor side.

4.	Insufficient fund.	1. Convergence of funds (Local bodies / other line departments / Govt. of India / projects / NGOs) through FDA. 2. Optimizing the scope of eco-restoration and livelihood promotion activities in coordination with line departments such as MNREGS.
5.	Insufficient data on stakeholder communities.	1. Conduct a socio-economic survey in the local community.
6.	Provision for water availability in settlements.	1. Provision for drinking water and irrigation facilities in the tribal settlements by constructing small check dams.
7.	Difficulty to access hospitals and markets.	1. Permission for tribals to use Methappu - Koodallar road. 2. Implement a project for the benefit of indigenous peoples living inside the Protected Aera, for improving the marketing facility of agricultural produces. 3. Facilitate the conduct of monthly health camps, immunisation, nutrition education programs etc. with the support of Health Department for the benefit of indigenous peoples living inside the Protected Aera.
8	Non settlement of individual rights and community rights.	1. Settlemernt of individual rights and community rights during this plan period.
9.	Non documentation and monitoring of cattle.	1. Documentation and monitoring of cattle population.

CHAPTER 6

Strategies Boundaries, Zonation, Zone Plans and Theme Plans


ECO-RESTORATION NURSERY - 2019

6.1. BOUNDARIES

6.1.1. LEGAL BOUNDARY

There is a marked difference between notified area and actual area of the PA. The Park shall be surveyed and steps shall be taken for rectifying the notification with the actual extent and boundaries of the PA. Wildlife Warden shall take action for appropriate rectification in the notification of the National Park. Boundary consolidation shall be completed during the present plan period.

6.1.2 INTERNAL BOUNDARIES

The National Park is divided into two zones, Core zone and Buffer zone. The map showing the internal boundaries of the Park, differentiating the zones is given in **Figure 2.1**

Core zone: The Core zone is 17.79 Km^2 in area, protected without any human interference.

Buffer zone: The Buffer zone of the National Park is 15.06 Km^2 in area, and is divided into three zones namely Eco-restoration zone, Eco-development zone and Tourism zone.

a) **Eco-restoration zone:** All the plantation area in the National Park is considered as Eco-restoration zone and it comes to around 8.45 Km^2. This Eco-restoration zone shall be converted to Core zone after the eco-restoration activities.

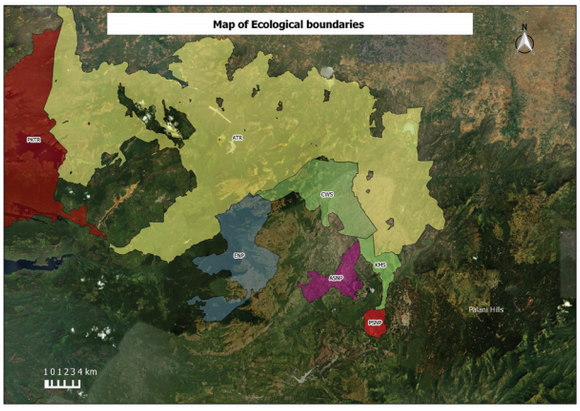
b) **Eco-Development zone:** The area inside the National Park occupied by the tribes for habitation and cultivation, viz Swamiyaralakudi, Valsapettykudi, and Koodalarkudi, are coming in this zone. The total extent of this area is 5.51 Km^2 respectively.

c) **Tourism zone:** This area includes Methappu and Perumala where the eco-tourism activities are conducted. It comes around 1.10 Km^2 and stand as Buffer zone even after the eco-restoration activities.

6.1.3. ECOLOGICAL BOUNDARIES

On the Northern side, the Park shares its boundary with forest areas under Kanthalloor Forest Range of the Marayoor Sandal Division and Chinnar Wildlife Sanctuary. The Eastern side, share its boundary with the Kurinjimala Sanctuary. The Park shares its Southern and Western boundary with forest under Munnar Territorial Division and KDHP Tea estates. The Park provides ecological connectivity between the Anamalai Tiger Reserve, Palani Hills of Tamil Nadu and the Reserved Forests of Munnar Territorial Division (Map showing the ecological boundaries of ASNP is depicted in **Figure 6.1)**.

FIGURE 6.1: MAP OF MUNNAR WILDLIFE DIVISION



6.1.4 EXTENT

As per the **Notification No.12876/F2/2003/F&WLD dated 14.12.2003 of the Kerala Government the extent of the Park is 750 Ha** (approx.). The extent within the notified boundaries was measured and verified by the GIS unit working under FMIS and it comes to 32.85 Km^2. An erratum notification is needed after resolving the discrepancy in the actual area and notified extent.

6.2. ZONATION

The objective of the zonation is to provide a geographical framework to manage the Park, with specific reference to priority management activities in different zones of the Park. Appropriate types and levels of interventions in designated areas of the Park assist in minimizing existing and potential conflicts. Zonation form basis for assessing the suitability of future activities and development proposals. The approved functional zonation is the main basis for decision-making on activities within the Park.

The Park zonation helps to:

- Provide a geographical framework to manage the Park.
- Indicate which management directions have priority in different parts of the Park.
- Provide a basis for assessing the suitability of future activities and development proposals.

6.3. ZONE PLANS

In order to achieve the objective the Park is divided into the following zones.

1. Core zone
2. Buffer zone
    a. Eco-restoration zone
    b. Eco-development zone
    c. Tourism zone

6.3.1. PLAN FOR CORE ZONE

The Core zone is the Protected Areas of specific interest for observing natural environmental development processes without any human impact. The protection regime completely excludes economic and recreation impact on protected ecosystems. Admissible activities include scientific research, environmental monitoring and specific conservation measures. The extent of the core area is 17.79 Km^2. The total area for the Park is calculated as 32.85 Km^2 as estimated by GIS Cell at Forest Headquarters. Core area acts as a reference point on the natural state of the ecosystems preserved in the Park. Information from the core area may be used to assess the sustainability of activities and the maintenance of environmental quality in surrounding areas. The focus of intervention is to ensure total protection of natural resources. The permitted activities mentioned in the respective chapters of this Management Plan, shall be allowed to be implemented. In the Core zone, the following activities will be carried out during the plan period

- Protection from illegal activities, which are detailed in the **"Theme Plan for Protection"** in **section 6.4.1**
- Fire protection activities including controlled burning and participatory fire management as given in **"Theme plan for Fire Management"** under **section 6.4.2**
- Watershed and Habitat management activities as detailed in the **"Theme Plan for Watershed and Habitat Management"** under **section 6.4.3 and 6.4.4**
- Research stud ies to facilitate improved protection and management of Core zone are detailed in **Chapter 9.**

6.3.2. PLAN FOR BUFFER ZONE OR MULTIPLE USE AREA

Buffer zone is the area unsuitable to be included in the Core zone due to specific circumstances. This zone can act as a Buffer for the Core zone and provides conditions for conservation of natural ecosystem while allowing strictly regulated restoration activities and activities for economic uses. The Eco-restoration zone, Eco-development zone and the Tourism zone together constitute the buffer area of the Park. The exotic plantation areas are included in the Eco-restoration zone and it comes to around 8.45 Km^2. The areas of the tribal settlements such as Valsapettykudi, Koodallarkudi and Swamiyaralakudi and their agricultural fields are included in the Eco-development zone (5.51 Km^2) which is on the Eastern side of the Park. The areas where Methappu log house, stone house, Perumala stone house are situated are designated as Tourism zone (1.10 Km^2). The Buffer zone will perform the following functions of

1. Restoration of the exotic invaded area (see **6.3.2.1**)
2. Promoting environmental conservation awareness (see **Chapter 9**)
3. Nature based regulated tourism (see **Chapter 7**)
4. Strengthen People-PA interface (see **Chapter 8**)

The activities prescribed for the Core zone are applicable to Buffer zone also. The activities to be carried out in Buffer zone are covered in the respective theme plans. Grazing and collection of natural resources for commercial purposes are prohibited in the National Park. At the same time the Forest Rights Act permits traditional rights for the tribes.

6.3.2.1 PLAN FOR ECO-RESTORATION ZONE

As per the previous Management Plan the Eco-restoration zone containing plantations occupy an area of 8.45 Km^2, comprising of 365.99 ha (3.66 Km^2) of eucalyptus, 455.60 ha (4.56 Km^2) of wattle and 23.83 ha (0.24 Km^2) of pine. The Plantation areas inside the Park are selected as the Eco-restoration zone and are shown in **Figure 2.1.** During this plan period approximately 30% of the plantation area will be eco-restored and converted to Core zone. The eco-restoration of the Park focuses mainly on the eradication of black wattle and eucalyptus plantations, establishment and maintenance of Shola-grassland species Nursery, facilitating the regeneration of the Shola trees by selective removal of invasive species etc. For restoration and maintenance of the originality of the Shola-grassland ecosystem and landscape the following strategies and activities are proposed during this plan period.

- Warden shall move a site specific proposal for removal of plantations from the Park and to improve habitat and restore the original vegetation.
- Fine tune techniques of restoration by studying eco-restoration works in similar habitats especially in Kodiakkanal and Valpara in Anamala Tiger Reserve of Tamilnadu,
- Assisted regeneration of indigenous species can be done in exotic removed area.
- Monitoring regeneration status and soil erosion.
- Establishment of a permanent plot for monitoring succession and eco-restoration.
- No activities other than those activities prescribed in the approved site specific plan shall be carried out. If any modification is required, prior approval from the Chief Conservator of Forest & Field Director (Project Tiger) Kottayam.

The above prescriptions are from the report of committee constituted to study the feasibility of felling and removal of Teak and other plantations species in the Protected Areas and eco-restoration of such areas to natural forest (May 2020) which is submitted to Government for the approval. More over to these activities a one time removal of exotic plantations in the Park shall be proposed by Wildlife Warden. The legal hurdles for commercial exploitation in the Protected Areas should be taken up in the higher level. One time removal of eucalyptus / wattle / pine plantations and its outright sale and the revenue generated from this will be used for the eco-restoration activities. The activities proposed during the present Plan period for eco-restoration of the plantation are as detailed as below:

1. ECO-RESTORATION OF BLACK WATTLE INFESTED AREAS

Wattle infestations compete with the indigenous vegetation, deplete water resources, reduce stream flow, disrupt catchment areas and pose an intensified fire hazard, thus threatening survival of indigenous biodiversity. Major hurdle in the eco-restoration activity by the eradication of black wattle are the disposal of biomass from the wattle removed areas and the chances of profuse regeneration of the wattle. Forest fire mainly occurs in the wattle removed area and large quantity of biomass accumulates in the field during the felling of wattle as part of eradication.

A wattle eradication and restoration programme is already in place in 50 ha fire burnt area at Pazhathottam. In the restoration area, felled / burnt logs were aligned in the contour. Wattle seedlings regenerated were continuously removed by engaging protection watchers and the area was planted with local grass and other indigenous species **(Table 6.1).**

The strategy proposed for restoration of wattle infested areas is as follows: Wattle plantations shall be cut and removed from the field and shall be stacked at a common place. The soil in the wattle removed area usually contains large quantity of dormant high resistant seeds, the follow up of which is the most significant part of eradication. As the dried biomass is highly predisposed to fire, during dry season it pose another severe threat to the forest area. The seeds of wattle are scarified by fire and causes alarming regeneration of the species. The debris shall be burnt during pre-burning before fire season. The wattle removed areas with observable natural regeneration of indigenous species are already in the process of conversion to natural vegetation. In the case of areas, where wattle eradication process have started earlier are characterised with profuse regeneration of wattle seedlings. The above said area shall be divided into 5 ha plots and watchers shall be engaged for removal of wattle seedlings and for planting indigenous Shola and grass species. This shall be continued for 5 years successively to restore the original natural vegetation. A landscape approach for the removal of wattle plantation in phases and restoration of natural vegetation should be done. Since it is a long term process, a separate EDC to carry out eco-restoration work exclusively, is recommended for ensuring the continuity of operations. Wildlife Warden shall submit a detailed project proposal for the removal of exotics in the National Park in phases. People along the fringe areas shall be permitted to collect the dry biomass of invasive species for their bonafide use as subject to Section 29 of the Wildlife (Protection) Act, 1972.

TABLE 6.1: SPECIES USED FOR PAZHATHOTTAM ECO-RESTORATION

Sl. No.	Species	Family	Local/English name	Endemism
1	*Zoysia matrella*	Poaceae	Cherappullu, Mascarene grass	Indo-Malesia, Australia
2	*Axonopus compessus*	Poaceae	Kaalappullu, carpet grass, buffalo grass	Native to America
3	*Poa annua*	Poaceae	Kolappullu, Annual Meadow Grass	Cosmopolitan
4	*Centella asiatica*	Apiaceae		
5	*Plantago rosa*	Plantaginaceae	Nilachakka, Njalamboori	Pantropical
6	*Drymaria cordata ssp. Diandra*	Caryophyllaceae	Pipili	India, Srilanka, Bhutan, Nepal, Cosmodia
7	*Jancu sinflexus*	Juncaceae		Indo-Malesia
8	*Care xmyosurus*	Cyperaceae		Indo-Malesia, China
9	*Taraxacum javanicum*	Asteraceae		India, Sri Lanka, Indonesia
10	*Oxalis corniculata*	Oxalidaceae	Puliyarila	Cosmopolitan
11	*Eleusine indica*	Poaceae	Maharanchini	India, Sri Lanka, Old World Tropics

II. ECO-RESTORATION OF EUCALYPTUS PLANTATIONS

Eucalyptus is another major exotic species present in the Park. Girdling of eucalyptus trees and selective felling shall be started in the Park during this plan period. The regeneration of the Shola trees needs to be facilitated and enhanced by the selective removal of eucalyptus trees from the plantation. which shall be carried out by the following steps:-

- Onetime felling permission for eucalyptus areas and pool the money for eco-restoration through FDA.
- Identify the areas having high regeneration of Shola seedling.
- Open up the canopy for enhancing the Shola trees regeneration by selective girdling / felling.
- Plant Shola tree species if necessary.
- Periodic removal of exotic herbs and shrubs as and when required.

- Protect the area from forest fire and grazing.
- Replanting of damaged seedlings shall be done in the monsoon.
- Open up the area depending on the regeneration of Shola trees in the following years.
- Monitor regeneration status and soil erosion.
- Establishment of a permanent plot for monitoring succession and eco-restoration.

Regeneration of a number of native species is also noticed along with the eucalyptus plantation. The native species regenerating in the eucalyptus plantation areas is shown in **Table 6.2.**

TABLE 6.2: NATIVE SPECIES REGENERATING IN THE EUCALYPTUS PLANTATION

Sl. No.	Species	Family	Local Name
1	*Acronychia pedunculata*	Rutaceae	Chakkimaram
2	*Litsea wightiana*	Lauraceae	Pattuthali
3	*Neolitsea cassia*	Lauraceae	Keezhambazham
4	*Cinnamomum sulphuratum*	Lauraceae	Kattukaruva
5	Cinnamomum sp.	Lauraceae	
6	*Phoebe wightii*	Lauraceae	Chudala
7	*Clerodendrum infortunatum*	Verbinaceae	Perivelam
8	*Maesa indica*	Myrsinaceae	Kattuvizhal
9	*Bhesa indica*	Celastraceae	Penali
10	*Elaeagnus kologa*	Elaeagnaceae	Kattumunthiringa
11	*Toddalia asiatica*	Rutaceae	Kanthammullu
12	Syzygium sp.	Myrtaceae	
13	*Symplocos cochinchinensis*	Symplocaceae	Pachotti
14	*Daphniphyllum neilgherrense*	Daphniphyllaceae	Kozhikkulamavu
15	*Macaranga indica*	Euphorbiaceae	Malavatta

III) NURSERY MANAGEMENT

Establishment of a Shola-grassland nursery is an indispensable element for the eco-restoration activities. Indigenous grass and Shola species can be exclusively raised in the nursery during the plan period for planting in the wattle eradicated areas. The following points shall be strictly adhered to:

(I) The works of the nursery shall be documented in an eco-restoration register.

(II) The progress of the work shall be monitored qualitatively and quantitatively.

(III) Protect the nursery from wild animals.

The annual time plan for the eco-restoration activities are given in the **Table: 6.3**

TABLE 6.3: ANNUAL TIME PLAN FOR ECO-RESTORATION

Period	Activity
Pre-Monsoon (March-April)	Nursery Activities Irrigate the previous year planted Shola trees Preparation of land for planting. Eradication of invasive / exotic species Collection of seeds for sowing
Monsoon (May-Sept)	Restoration activities (Planting) Provision for tree guard for planted trees & protect the planted grass species from herbivores. Eradication of invasive / exotic species
Post Monsoon (Oct-Nov)	Eradication of invasive / exotic species Nursery activities (collection of seeds & grass species) Maintenance of planted seedlings and grasses
Winter/ Summer (Dec-Feb)	Eradication of invasive / exotic species Irrigation of planted seedlings. Nursery activities (Collection of seeds)

IV. ECO RESTORATION OF AREAS INFESTED WITH INVASIVE WEEDS

Invasive weeds such as Eupatorium and Bracken fern are commonly seen in the Park. The current practise of removal of such species is by uprooting / cutting before flowering and burning the dried matter to eliminate the chances of regeneration. An estimation of the infestation of weeds in the Park shall be conducted during the present plan period and appropriate steps shall be taken for their eradication. Weed eradication shall be included in the Annual Plan of Operation and shall be monitored regularly.

6.3.2.2 PLAN FOR TOURISM ZONE

The sustainable management of the Park is linked with generation of adequate revenue for day today activities, meeting the manpower requirements and other budget allocations for Park maintenance. Eco-tourism focuses on generating revenue by providing avenues to live in harmony with the nature, travel to destinations rich in scenic beauty, flora, fauna, and natural heritage. It purports to educate the travelers, provide funds for conservation; directly benefit the economic development and empowerment of local communities. In addition to this, eco-tourism also aims at the promotion of concepts of eco-friendly living, recycling, energy efficiency, water conservation, stake holder partnership and responsible tourism for the local communities. The areas around the Methappu, checkpost, the road from Methappu to Perumala and the areas around the Perumala Check post are considered as Tourism zone. This zone is designated to manage visitors and provide amenities for inspirational, educational, cultural and recreational purposes at a level which will not cause significant biological or ecological degradation to the natural resources. All the activities in this zone shall be implemented as per the plan of action described in **Chapter 7. 'Tourism, Interpretation and Conservation Education'.** All the activities prescribed in the protection and restoration zone will be implemented in the Tourism zone.

6.4 THEME PLAN

6.4.1 THEME PLAN FOR PROTECTION

The extent of area notified as the ASNP vide the **Notification No.12876/F2 2003/F & WLD dated 12.12.2003 is 750Ha** (approx.), whereas the extent of area estimated by GIS Cell at Forest Headquarters and 32.85Km^2. Major threats to the Park are the presence of plantation of invasive / exotic species, the presence of settlements inside and around the Park and forest fire. Chances of ganja cultivation, illicit distillation, poaching, smuggling of timber etc. are likely to occur in the Park area. There is growing pressure on the natural resources of the Park in the form of grazing, firewood collection, NWFP collection, excessive dependency on water, etc. Although the Park was notified in 2003, there are many gaps in protecting the natural resources of the Park. In order to protect the natural resources of the Park, the following strategies and activities are proposed in this protection plan.

A proposal for the declaration of Eco-Sensitive Zone (ESZ) 0-1 km from the notified boundary (excluding boundaries of Kurijimala Sanctuary) of the Park is submitted to MoEF. ESZ covers an extent of 30.7 Km2 area around the Park which partially includes Kanthalloor, Keezhanthoor, Kottakkamboor, KDH and Vattavada villages. After the final notification of ESZ, a Zonal master plan will be prepared within two years for the management of ESZ.

The Wildlife Warden and the Assistant Wildlife Warden will be responsible for overall control of the Park. The Chief Conservator of Forests and Field Director (Project Tiger) Kottayam and Chief Wildlife Warden will be responsible to implement and review the protection plan. This protection plan will serve as a guideline with effective strategies to mitigate spatial and temporal threats and the problems in achieving the objectives of management. Strategies identified in order to tackle the threats and strengthen the conservation are given below;

6.4.1.1 CONSOLIDATION AND MAINTENANCE OF BOUNDARY

The Park covers the entire area of Block Numbers. 55, 57 of Kanthalloor village, 59 of Kottakamboor village and part of Block 60 of Vattavada Village of Devikulam Taluk, Idukki District. As per the **Notification No.12876/F2 2003/F & WLD dated 14.12.2003 of the Kerala Government the extent of the Park is 750 ha** (approx.). The extent within the notified boundaries was measured and verified by the GIS unit working under FMIS and it comes to 32.85 Km^2. An erratum notification is needed after resolving the discrepancy in the actual area and notified extent. Since the fund / resource allocation is depending upon the notified area, necessary correction in the area has to be made by issuing an appropriate erratum notification. About 40 % of the Park boundary is consolidated with permanent cairns during the previous plan period. 60 % of the South and South East boundary of the Park needs to be consolidated and demarcated with cairns / pillars in this plan period.

6.4.1.2 REORGANIZATION OF ADMINISTRATIVE UNITS

The staff of Kadavari Forest Station is presently deployed for the management of the Park. In order to effectively manage the Park, separate manpower has to be created including 1 Deputy Range Forest Officer and 4 Beat Forest Officers. (one for the eco-tourism and nature education programme, one each for the eco-restoration programme and one for the protection and management of the Park) **(Table 6.4).**

TABLE 6.4: PROPOSED STAFF STRENGTH

Sl No.	Category	Present Staff Strength	Proposed Staff Strength
1	Assistant Wildlife Warden	1	0
2	Deputy Range Forest Officer	0	1
3	Section Forest Officer	1	0
4	Beat Forest Officer	4	4
5	Lower Division Clerk	0	1
6	Tribal Watcher	1	0

6.4.1.3 ANTI-POACHING CAMP SHEDS [EXISTING & PROPOSED]

At present, except Jandamala, Thamburankavala and Iddalimotta, the vulnerable areas do not have enough anti-poaching camp sheds. It is proposed to construct anti-poaching camp sheds at KDH Para, Beppurmala, Pazhathottam and Mattuchola. These anti-poaching camps are used for camping for staff and watchers during their perambulation. The camping schedule will be in accordance with the HoFF's circular (HF-1/189/2020, Dated: 15.09.2020). The periodical maintenance and improvement of the existing anti-poaching camps / chowkies (temporary camp sheds) and patrolling camps shall be carried out as and when required.

All basic amenities for the staff in all the existing and proposed anti-poaching camp sheds / chowkies (temporary camp sheds) shall be ensured during the Plan period. Regular interior patrolling and camping as envisaged in the previous Management Plan shall be continued during the present plan period with necessary improvisation. The Wildlife Warden shall take action to permanently man the anti-poaching camp sheds with suitable staff and amenities.

6.4.1.4 OFFICIAL AND RESIDENTIAL BUILDINGS

A station for Anamudi Shola National Park is proposed during the Plan period. Station building, staff quarters and Deputy Range Forest Officer quarter shall be constructed at Perumala. The Wildlife Warden shall take necessary steps to ensure required infrastructure facilities like furniture, communication, welfare amenities for staff etc. and ensure proper upkeep and maintenance of buildings at the station headquarters. The checkpost building at Methappu can be renovated to a section office named Idivara - Pullaradi Shola Section. At present the Section Forest Officer does not have a separate quarter and he stays at the section / checkpost building at Perumala and hence construction of a quarter for SFO is proposed during the plan period. New buildings and renovation of existing buildings, (if required) are also proposed during the plan period. Furniture, additional storage facilities, furnishings and supplies shall be ensured in all the official and residential buildings during the plan period.

6.4.1.5 PATROLLING SCHEDULE

The entire area of the Park is divided into 4 patrolling units and a perambulation schedule is prepared and communicated to staff in advance on monthly basis for implementation. As per the previous Management Plan, the Park area is divided into 5 patrolling units namely, Mattuchola, Iddalimotta, Perumala, Thamburankavala and Pazhathottam. The patrolling team consists of 2 staff (one armed) and 3 watchers. Each unit shall be completely perambulated once in 2 weeks. The Assistant Wildlife

Warden and Wildlife Warden also undertake frequent patrolling and make sure that the monthly perambulation plan is followed by the designated staff. Frequent special boundary perambulation is to be arranged by the Wildlife Warden / Asst. Wildlife Warden. The staff on duty shall maintain a movement register and wildlife monitoring register. The Assistant Wildlife Warden and the Wildlife Warden shall carry out frequent inspections and ensure that perambulation works are carried out properly. During monsoon period special patrolling and camping for 3-4 days will be carried out in the Park as part of protection plan. Moreover that inter-division patrolling and camping shall also be carried out.

6.4.1.6 CO-ORDINATION WITH OTHER DIVISION

Perambulation, patrolling and regular monitoring of the Park area sharing boundary with other Division boundaries and frequent sharing of information between the officials of neighboring Forest Divisions is being done. Assistant Wildlife Warden and Wildlife Warden should take necessary steps for conducting frequent perambulation along the division boundary.

6.4.1.7. STRATEGIES FOR ADDRESSING SPECIFIC ISSUES IN THE PARK

I) Plantations of Exotics:

Invasion of exotic plantations is the major issue to be addressed during the present plan period. Strategies for addressing the issues are already described in **6.3.2.1 Plan for Eco-restoration zone.**

II) Collection of NWFP and Firewood:

The NWFP collected from the Park are wild honey, thippali, bhadraksham, kattupadavalam. No scientific study on the permissible limit of NWFP from the Park area is conducted so far. This issue is dealt separately in the **Chapter 8 Eco-development.** Fire wood collection is permitted only from the invasive / exotic plantation areas. Permission is granted only for the collection of firewood for the bona fide use of people living in the tribal settlements and in the fringe area.

6.4.1.8 FIRE

Fire prevention is a priority area during the present plan period. This issue is dealt separately under **Theme Plan for 'Fire Protection'.**

6.4.1.9 PRESENCE OF ROAD THROUGH THE PARK

The following forest roads are passing through the Park.

Sethu Parvathipuram (S.P. Puram) - Kanthalloor road	-	6km
Methappu to Valsapetty	-	9 km
Koodallarkudi to Koviloor	-	1.5 km

All these roads are fair weather roads. These roads are now only used by the tribal people and the local people for movement. Other vehicular movement is strictly prohibited through the Park. Restrictions on movement of vehicles during night, signage showing speed limit and wildlife movement, fine for violations of the Park rules, night patrolling etc. are proposed during the present plan period in the above said road. The restrictions imposed in the Sethu Parvathipuram (S.P puram) - Kanthalloor road in the previous plan period will be continued during this plan period also.

6.4.1.10 WEEDS

Species such as eupatorium and bracken fern are considered as the commonly seen weeds in the

Park. No studies have been conducted on the extent and distribution of weeds in the Park. An estimation of the infestation of weeds in the Park shall be conducted during the present plan period and appropriate steps shall be taken for their eradication. Weed eradication by uprooting / cutting shall be included in the Annual Plan of Operation and shall be monitored regularly.

6.4.1.11 REAL ESTATE PRESSURE ON THE FRINGE LANDS

There is potential threat due to pressure of real estate mafia on the fringe area of the Park. The fringe area is notorious for the illegal possession of government land, land grabbing by politicians and pressure groups for tourism and farming purpose. The private land in the area is characterized by the large scale felling and extraction of wattle and eucalyptus accelerating the degradation. Such interventions along the fringe in this fragile ecosystem will exert pressure on the habitat conservation, free wildlife movement and species propagation. Moreover, social factors like reverse migration of people of the State, economic decline, shift in the employment patterns etc. are likely to increase pressure on the land. Consequently there is likelihood of increase in the commercial exploitation of land and natural resources for various purpose and other illegal activities in the region. Hence awareness programs shall be given to the local communities to sensitize the permitted, regulated and non permitted activities within the Eco-Sensitive Zone.

6.4.1.12. POTENTIAL THREAT OF POACHING

The fringe areas of the Park are eucalyptus plantation and farm lands and the availability of easy food is likely to attract the wildlife of the area to the fringe areas and there is likelihood of instances of trapping, poisoning and electrocution etc. of wildlife. Shift in the food pattern from vegetarian diet to non-vegetarianism also act as a triggering factor to trap, or kill wild animals for meat. However, possibility of poaching cannot be ruled out in the coming years. Appropriate protection measures, such as regular perambulation, interior camping, awareness creation among the public etc. shall be adopted.

6.4.1.13 TOUGH TERRAIN

The issues related to conservation of difficult and inaccessible areas will be tackled through creation of new trek paths for effective protection and improving the camping facilities like tents, field gears including GPS, compass, binoculars, digital camera, torches, drone etc.

6.4.1.14 WILDLIFE HEALTH MONITORING

Wildlife health monitoring was not seriously undertaken in the previous plan period. But in this plan period disease surveillance, wildlife surveys, detection of wildlife health by carcass / faecal examination, observing wildlife with disease symptoms, monitoring animal behaviour, eating patterns, treatment of sick / infected animals, procurement of gadgets for rescue and rehabilitation of wildlife, immuisation of cattle, monitoring of cattle population and promotion of stall feeding etc. shall be done in the present plan period.

6.4.1.15 INFRASTRUCTURE DEVELOPMENT

I. **Improvement of facilities in existing camping stations:** The existing camping stations and anti-poaching camp sheds shall be improved with basic amenities such as solar power lantern, cots, beds & mattress, kitchen utensils, drinking water, essential furniture, supplies etc.

II. **Check posts and Chain gate:** At present there are two check posts in the Park, one each at Methappu and Perumala. The tribals residing in the settlements in Koodallarkudi, Valsapettykudi and Swamiyaralakudi are having the right of way through the following routes.

1) Methappu to Valsapetty - 9 km (Methappu to Valsapetty road is provided with a chain gate.)

2) Koodallarkudi to Silanthiyar - 1.5 km

3) Puthur – Koodallar - 4 km. (This route is used for transportation of goods using mules.)

4) The S.P. Puram – Perumala road - 6 Km (This road is already manned by a checkpost)

The Wildlife Warden shall take necessary arrangements for installing chain gate / barricade / checking stations at required points whenever necessary. Establishment of new barricades / chain gates in strategic locations regular upkeep and maintenance of the existing check posts / chain gates, display boards etc. are proposed during the plan period.

III. Roads:

The above said roads are passing through the Park. Timely maintenance of these roads has to be done for proper patrolling and protection. These roads will be maintained based on the recommendations of the Sub-committee on guidelines for roads in Protected Areas. **(Annexure: 6.1).** Strict regulations on vehicular movement shall be continued. Necessary drainage, culvert, barricades etc. are proposed during the plan period.

IV. Trek Paths:

A total length of 34.6 km of trek paths as given in the **Table 3.10** exists in the PA by the end of the previous plan period. These trek paths were constructed for perambulation and protection purposes and the same shall be annually maintained to facilitate protection subject to the availability of funds. New trek paths shall be taken only after obtaining the approval for CCF & Field Director (PT) in emergency situations.

V. Communication Facilities:

At present there is only one walkie-talkie. A new wireless system with 2 main stations and 8 walkie-talkies is proposed for the Park during the current plan period. Upgrading of tele / mobile / internet communication facilities, provisions to start technological support for strengthening the communication infrastructure etc. are proposed during the current plan period.

VI. Vehicle:

At present the Assistant Wildlife Warden with head quarter at Top Station and the Section Forest Officer, Anamudi Shola NP has vehicles. A bike is also provided for the staff. Maintenance of these vehicles / procurement of additional vehicles shall be carried out as and when required during the plan period.

VII. Arms and Ammunition:

At present the Assistant Wildlife Warden is provided with 1 Revolver and the Park is provided with 1 Rifle (.315) and ammunition (5 nos). It is proposed to procure 4 rifles and minimum 50 nos of ammunition. Proper maintenance of arms and ammunition carried out during the previous plan period shall be continued in the current plan period. Timely training shall be given to the staff in weapon handling.

VIII. Deployment of Staff:

No separate posts are created for the management of Anamudi Shola National Park. Necessary man power is deployed from Kadavari Station for the day to day functioning of the Park and management of eco-tourism. This results in insufficient manpower and declining sense of accountability. All vacant posts have to be filled up regularly. For effective protection of the Park, a station is proposed in the Park with an additional staff of one Deputy Range Forest Officer and 4 Beat Forest Officers. Appointment of necessary manpower on contract basis is found as the viable and productive option for the management of eco-tourism. Hence such viable and suitable options are proposed to ensure necessary manpower during the current plan period. Capacity building traning to the staff for the efficient management of the Park shall be considered a priority area in the current plan. Training to be imparted to staff on various topics such as identification of plants and animals, identification of health issues in wildlife, unarmed combat, survival skills, usage of fire arms, first aid, swimming, driving, life skills, public relations, team work, wildlife crime detection, intelligence gathering, preparation of offence reports, legal literacy, GIS, application of technology in conservation etc. Selected staff shall be trained as 'handlers' as part of intelligence gathering. Exposure training to staff on identification of plants and animals shall be periodically provided to staff. In addition to the above, local community members from EDCs with aptitude shall be identified and trained for front office management, stake holder relations, tourism facility management, housekeeping, communication, reporting etc.

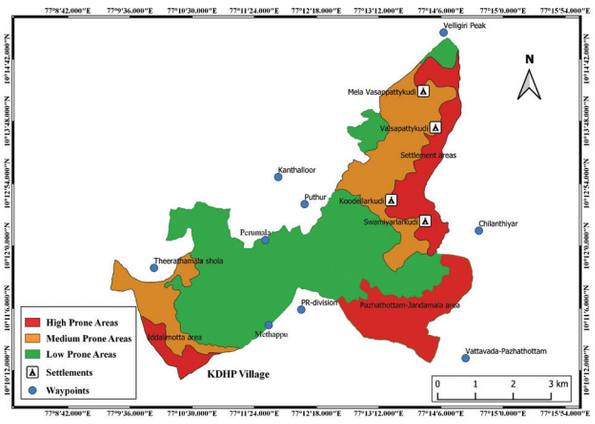
IX. Intelligence Gathering and Co-ordination:

The Wildlife Warden, Assistant Wildlife Warden and staff are responsible to establish and maintain liaison with NGOs, people's representatives, EDC members, tribal heads, interstate officers, Crime Control Bureau officials, line departments etc. in sharing information. The Assistant Wildlife Warden is responsible to establish various channels of credible and reliable information. Confidential sources and agents to be identified trained and placed in position to get reliable information for the smooth functioning of the Park. Appropriate reward system is proposed for informants. Necessary approval for the introduction of reward system to the informants depending on the type of crime and information is to be obtained by the Wildlife Warden during the plan period. Legal support is to be made available as and when required.

6.4.2. Theme plan for Fire management

The Park being located in the physical proximity of several human settlements, fire protection is one of the major areas of concern. The presence of exotic / invasive plantations inside the Park is a great threat during the fire season. In some places these plantations are seen in contiguous with the private plantations and any incidents of fire in these private plantations if remain uncontrolled may cause huge fire inside the Park. Fire management plans shall be prepared well in advance annually before the onset of fire season. While preparing fire plan, the natural features such as camping stations, existing roads, trek paths, water sources etc. shall be considered. Annual fire protection measures in the Park are in accordance with the approved fire management plans. The fire prone areas in the Park are Iddalimotta, Mattuchola, Pazhathottam, Beppurmala and Thamburankavala, where dense growth of exotic plantations and grass lands are found. Fire prone areas of the PA is given in the **Figure 6.2**

Figure 6.2: Fire Prone Areas of ASNP



6.4.2.1 General Guidelines for Preparation of fire management plan

- Identify the cause and consequences of fire at PA level
- Prepare fire management plans on annual basis.
- Identify the fire prone areas and plot every instance of fire with area burnt in last five years.
- Identify the fire prone areas. A journal shall be kept at the Range Office wherein the **(1)** Date of occurrence of fire **(2)** Location of occurrence of fire **(3)** Area burnt etc shall be recorded. The fire prone areas shall be given special attention.
- Prioritize and map the fire prone areas based on local knowledge and previous fire incidents.
- Identify the factors causing fire and necessary steps to eradicate them.
- Purchase of necessary firefighting equipment.
- Training to field staff and firefighting squad in firefighting and personal safety.
- Develop proper monitoring protocols and document the results and effectiveness of fire protection measures taken annually.
- The existing firelines shall be cleared annually before the fire season. Status of firelines shall be periodically monitored to check the status of accumulation of debris in the firelines. New firelines shall be taken according to the needs of the situation.
- Awareness programs through appropriate medium to the forest dwellers and communities in the fringe area shall be done regularly including distribution of pamphlets, brochures, banners, notices, mike announcements, programs in local cable TV, FM radio networks etc.
- Resources like manpower, vehicles, wireless, equipment etc. available with adjoining divisions (Munnar Forest Division, Marayoor Forest Division) and other departments like Police, Fire Force etc. may be tapped in exigencies. Unsafe and careless firefighting strategy will not only be hazardous or even fatal to men at the fire front but also will impede their efficiency in fire situations resulting in more areas being destroyed by fire. All the fire safety measures should be described in detail in the fire management plans. Briefing on fire management should essentially include briefing on fire safety also.

6.4.2.2 Fire Management Strategies

Following measures are proposed to prevent extensive fires: -

(I) Firelines: The Assistant Wildlife Warden shall take necessary steps to maintain the firelines in the fire prone areas given in **Table 3.5.** Necessity of additional firelines shall be examined by the Wildlife Warden and shall be carried out depending upon the need / exigency of the situation after obtaining approval from CCF & Field Director (PT). The schedule for maintenance of firelines as given in **Table 6.5** shall be borne in mind while executing the fire management plans.

- Firelines will be taken as per the guidelines adopted by KFD.
- No fireline shall be taken on the edge of the Shola forest. The fireline around the Shola shall be taken giving the reasonable space for the extension of Shola forest.

Table 6. 5: Schedule for Maintenance of Firelines

Sl. No	Period	Activity
1	December 1- January 15	Taking of firelines. The materials cut shall be left on the middle of the firelines to dry
2	January 15 - February 15	1st burning of the cut materials left on the firelines
3	March 15 - March 30	1st sweeping of the firelines for leaves and un-burnt materials and leaving them on the middle of the fireline
4	April 1 – April 15	2nd burning of the cut materials left on the firelines
5	May 1- May 15	2nd sweeping of the firelines for leaves and un-burnt materials and leaving them on the middle of the fireline
6	May 16 – May 30	3rd burning of the cut materials left on the firelines

The burning activity shall be carried out in early morning or evening hours when the temperature and wind flow is comparatively low. When the burning activity is carried out, it should be ensured that fire protection watchers are posted on either side of the fireline to ensure that fire doesn't spread to the forest.

(II) Controlled pre-burning: Controlled burning shall be carried out all around and in between the plantations and in grasslands of at least 30 m width by clearing a strip of 5 m on both sides as shown in **Figure 6.3.** Controlled burning is done to prevent the rapid spread of fire and is to be completed before January 15. The above process is beneficial for the wildlife since summer showers will enable the growth of new green grasses. The areas proposed for controlled burning is given in **Table 6.6.**

Figure 6. 3 : Diagram showing controlled pre-burning and strip burning

Guidelines for controlled pre-burning

- All the areas to be burned shall be identified and recorded in the fire plan.
- Controlled burning shall be normally carried out during the months of December-January.
- Controlled burning shall be carried out all around and in between the plantations and in grasslands.
- The burning activity shall be carried out in the early morning or evening hours when the temperature and wind is comparatively low.
- Before burning, steps shall be taken to drive out animals and birds.
- Fire should be set opposite to the wind direction to control the speed and intensity.
- On hill slopes, fire is to be set from top down direction for better control.
- Controlled burning shall be carried out in the presence of adequate number of experienced staff, with the aid of all safety measures and equipment.

Table 6.6: Areas proposed for control burning in ASNP

Sl No	Area	Distance (KM)
1	Saypankadu- Beppurmala	2
2	Theerthamala- Ottakombumala	2.5
3	Ottakombumala- Iddalimotta	6
4	Pothunchal- Jandamala	1
5	Kambakallu-Valsapetty	7
6	HNL plantation- Valsapetty	4
7	Anivara(grass land)	2
8	Iddalimotta area	6
	Total	30.5 Km.

(III) Fire protection mazdoors: Fire watchers shall be engaged throughout the fire season for efficient fire protection activities. In addition to Fire watchers, fire gangs shall be engaged at Pazhathottam, Iddalimotta and Mattuchola. During emergencies additional mazdoors can be engaged for fire protection works.

(IV) Firebreak creation: Exotic plantations present in the Park are continuous and highly prone to fire. Effective prevention of fire in these exotic plantations can only be achieved through creation of Firebreaks by removing exotic trees from the border areas to a 30 m width and should regularly be weeded before fire season.

(V) Participatory fire management: Responsible involvement of all the stakeholders is important in the management of forest fire. Local bodies, tribes, KDHP, farmers, resort / home stay owners adjacent to Park are the main stake holders of the Park.

- Panchayath level Jagratha Samithi's shall be formed in Vattavada and Kanthalloor panchayath including representatives from all categories of stakeholders of the Park.
- Regional Jagratha Samithi's will be formed at Vattavada, Koviloor, Pazhathottam, Silanthiyar, Tribal Colonies, and Puthoor by including representatives of all categories of stakeholders.
- In order to create awareness among public against the incidents of forest fire, its early detection and also to get early information regarding instances of forest fire, campaigns and awareness programs through various mediums, for different target groups will be organized and conducted annually. Public meetings, rallies, street plays, advertisements in popular media, boards, banners, notices, stickers, short films, competitions etc. can be constructively used to raise awareness and improve community participation.
- Fringe EDC has to be formed by including all stakeholders around the Park for strengthening the fire prevention measures.
- Fire protection and fire management operations are being carried out by involving the Estates functioning in the boundaries and adjoining areas of the Park. Firebreaks are made in plantations functioning under KDHP in Chundavurrai and Chittavurrai Estates. Fire awareness programs are conducted in coordination with Estate authorities in the above areas.

(VI) Awareness & Training: Awareness campaigns and training are essential components for fire prevention, especially in the surrounding human settlements near the Park. Focus will be given to the tribal settlements and members of fringe villages. Appropriate mode of interventions like public meetings, rallies, street plays, advertisements in popular media, boards, banners, notices, stickers, short films, competitions etc. can be constructively used to raise awareness. EDC based awareness campaigns highlighting fire preventive and containment measures among children and youth in the locality shall be held during the fire season. Development of innovative programs such as short films, videos, movies with area specific bi-lingual audio visual content is proposed for awareness building in among different stake holders.

(VII)Training programs : Periodical training programs for staff, watchers and other members of the community involved in fire protection shall be organized.

(VIII) Fire watch tower and communication network: The present infrastructure and communication facilities shall be made use of for fire protection, to prevent the fire incidents and to mobilize additional forces in necessity. If necessary temporary sheds shall be erected in the fire prone areas during the fire season with sufficient manpower round the clock for constant surveillance. Presently only one watch tower functioning at Methappu.

(IX) Firefighting equipment: All essential firefighting equipment including gum boots, fire resistant suit, blower etc. may be procured and made available to the fire camps.

(X) Impact monitoring: Incidents of fire shall be documented and reported promptly to the Field Director and the Chief Wildlife Warden. Controlled burning areas shall be monitored to assess their impact and streamline future activities. The Wildlife Warden shall review the fire plan every year after the fire season. The gap in fire protection shall be identified and suitable measures to strengthen the same shall be taken at all levels.

6.4.3 THEME PLAN FOR WATERSHED MANAGEMENT

The quality and utilization of habitat by the wild animals depends on the availability of water resources within their reach. The Park area is the watershed of Amaravathi River. Many streams originate from this Shola and some of them are perennial in nature. All the streams from the region flow eastwards and join the Pambar River and Thalinji Aar which are the tributaries of Amaravathi River. There are several natural water bodies like streams, nullahs, marshy areas and swamps in the Park.

Surface water repositories play a critical role in Protected Areas and wildlife corridors, particularly in the hot months. They maximize water retention in the soil and are crucial to ecosystem health from becoming focal points of wildlife movement. Seasonal depletion of water bodies over years is a natural phenomenon in the landscape in recent years, been accentuated by climate change. Regular mechanism is to be provided to monitor the water level and replenish these waterholes and prevent them from drying out. Camera traps need to be placed around the waterholes to record animal presence. Depending on the need additional waterholes may be constructed wherever necessary. Management interventions (other than protection) in natural waterholes must be kept to the barest minimum to allow ecological processes to play out. The impact on the vegetation of aggregating herbivores around water holes needs to be minimized. Artificial water holes helps to alleviate the effects of water shortage in the natural sources. The location of the artificial water holes is to be distributed in such way as to make sure the water availability in the Park area and minimize potential human animal conflict.

In addition to the natural sources, artificial sources such as check dams and ponds are also created in the Park. A total of 10 check dams and 9 ponds exist in the Park **Annexure 2.3.** Communities residing at Puthoor, Perumala, Pazhathottam and Silanthiyar also depend on the water from the Park for drinking and irrigation purposes. Check dams are mostly constructed using LSGD funds for providing drinking water projects for the local community. However, these water sources are meeting the needs of the wild animals also. The following guidelines shall be followed for the management of the check dams and ponds in the Park.

(I) General guidelines for management of ponds and check dams

- The existing check dams and ponds shall be desilted and maintained properly. Desilting shall be carried out before the beginning of monsoon.
- The silt removed from the structures shall be dumped and arranged in such a manner to raise the height of the structures and thereby increasing the water holding capacity. Under no circumstances the silt and mud removed be dumped as such nearby as it will then be washed back into the structures during rains thereby nullifying the purpose of desilting.
- Desilting works and other cleaning works shall be entrusted to the forest dependent communities through EDCs which helps in employment and uplifting their livelihood.
- A gradual slope or approach shall be provided around the water hole / check dam to enable easy drinking water accessibility for the wild animals.

- The nearby streams and rivulets shall lead into the water holes as feeder drains. A small path can be dug depending upon the conditions prevailing in the ground. This can help in improving the drainage network and ensure availability of water everywhere.
- In many a case, it can be seen fallen trees or drift wood lying in the water hole or check dams. Once decayed, they affect the quality of water and can block the normal flow of water. These fallen trees and drift wood shall be removed and left to decay in the forest.
- The check dams and water holes which dry up in December and January may be deepened in order to store more water to increase the availability throughout the year.
- Soil and moisture conservation works may be taken up on priority basis in the vicinity and surrounding streams, water holes and check dam which dries up in lean period.
- The impact of soil and moisture conservation work may be measured from the recharging water in streams ponds and check dams which dries otherwise in lean period. Assistant Wildlife Warden shall maintain proper record for this purpose.
- Quality of water shall be monitored especially in those areas near to human habitations / use for microbial presence / contamination etc.
- Journal on check dam and pond management should be maintained at Range / Section level.

(II) General guidelines for identifying suitable sites for construction of ponds and check dams

- New eco-friendly check dams or ponds shall be constructed based on the scientific assessment of the requirements.
- Locations where the ponds / check dams will be fully exposed to direct sunlight, chances of evaporation are high and shall as far as possible be avoided, except in exceptional circumstances.
- All new constructions shall be away from the existing ones.
- Ponds and check dams shall be constructed away from the Park boundary and from human settlements to rule out the possibility of poisoning the water and chances of poaching.
- Location identified shall ensure that only minimal to zero trees are cut / felled / destroyed / submerged for the purpose.
- Areas prone to soil erosion shall be avoided.

To provide judicious distribution of water sources for wildlife and to fulfill the water needs of the local people, detailed information needs to be generated during the plan period. The following activities are proposed as part of water resource management:-

- Mapping of water sources – water holes, check dams, streams and other natural sources with seasonality.
- Installation of automatic weather station for regular recording of weather data.
- Initiation of dialogue with local bodies and beneficiaries for water sharing and watershed conservation.
- Conduct feasibility study to retain water in crucial locations inside and outside the Park.

- Implementation of suitable measures for maintaining and improving watersheds like bring back original vegetation in restoration zone, soil and moisture conservation measures etc.

The awareness level and practices of local communities are not conducive to water conservation. Water harvesting structures are not adequate and soil erosion is evident in steep slopes. The line departments involved in the soil and moisture conservation, ground water conservation, etc. have poor linkages with KFD. Hence the following strategies are proposed to overcome these drawbacks: -

- Collect available maps from FMIS, LUB, CESS, CWRDM, IFP etc and prepare micro drainage maps of the Park.
- Create awareness among the local communities for efficient use of water resources.
- Address the problem of water shortage for human use through FDA.
- Assess the shortage of water sources within the Park and develop appropriate measure to address the same through FDA, MNREGS.
- Develop rain water harvesting structures in crucial locations using funds from various projects / plans / local bodies.
- Construction of brushwood check dams using poles / trunks of eucalyptus / wattle.
- Soil and moisture conservation measures shall be taken up in areas with high soil erosion.

The Wildlife Warden shall prepare a status paper on water resources and seasonality calendar and propose a programme for development of water holes and check dams accordingly during the current plan period.

6.4.4 Theme Plan for Habitat Management

The Park is home for wild animals necessitating to meet their vide variety of requirement for species survival and propagation such as food, fodder, shelter, conducive situation for copulation, breeding cover, preservation of gene pool, etc. Hence improving the quality of the habitat shall promote wildlife population of the area. As part of habitat / species monitoring, studies like mapping of vegetation, wildlife health monitoring, documentation of flora and fauna including RET and endemics, population monitoring of selected flora and fauna, habitat utilization and movement pattern of elephants, invasive species that have negative impact on ecosystem, spatial and temporal distribution of water sources, mapping of water sources, drainage map, monitoring of burned areas, impact of controlled burning on the habitat utilization and distribution of small animals like amphibians, quantification of fire wood, eco-restoration in plantation areas, regeneration status of RET and endemic flora, monitoring Shola etc. shall be taken up on priority basis during the plan period.

The Tribal Rights Act 2006 defines Critical Wildlife Habitats (CWH) as areas that are “required to be kept as inviolate for the purposes of wildlife conservation.” Such areas are determined for each Protected Aera by a committee which has scientists, local people, and a representative from the Ministry of Tribal Affairs. In order to notify a CWH, the Act requires state governments to establish that the presence of right-holders is causing irreversible damage to wildlife and their habitats, and that co-existence between rights holders and wildlife was not a reasonable option. Identification of the CWH is to be conducted in this Management Plan period. Committee is already constituted and notification process to be completed as per the guidelines of the National Tiger Conservation Authority (NTCA). Harvesting of NWFP shall be restricted from the CWH areas. As of now no community rights have been issued.

(I) Maintenance of Swamps

A marshy area or swamp is a place inside the Park dominated by grasses and sedges. Small streams originate from these areas and as such are always wet and moist which in turn help in keeping fresh and green vegetation all throughout. This area is unique in terms of microhabitats for amphibians and micro fauna **Annexure 2.3.**

Prescriptions for management of marshy areas (Swamps)

- Invasive weeds and tree saplings shall be removed. Weeds shall be eradicated before the flowering season.
- Surrounding forests and drainage systems to the swamp shall be protected from all kind of biotic interference.
- The treatment areas shall be monitored to evaluate the management interventions.

(II) **Supplementation of Animal Nutrients**

In an ecosystem, supplementation provides sodium calcium, iron, phosphorus and zinc required in the spring time for bones, muscles and growth for the wildlife. All trace elements like copper, magnesium and cobalt are retain in the nutrient supplemented area for the metabolism of most mammals. Animals regularly visit these areas in the ecosystem which are composed of primarily common salt (sodium chloride). It provides sodium, calcium, iron, phosphorus etc. Salt licks occur naturally in certain locations in the forest where mineral salt are found on the ground surface. Shortage of sodium in the plants which are eaten by wildlife motivate the animal to eat a lot of soil at the lick (Ayeni, 1972). The shortage is as a result of water soluble sodium salts being leached out during heavy rain following long period of desiccation. Some plants even substitute potassium ions for sodium ions uptake from soil without showing mineral deficiency symptom (Buckman and Brandy 1960). Many plants are also rich in sodium and potassium, but with the depletion of such forest sources animals tend to wander around fringe area settlements and tourism facilities which increases negative human animal interactions and pose threat to wildlife. Thus nutrient supplementing area may be set up in appropriate location to provide essential nutrition for their survival. It also eliminates the chances of wildlife straying around human settlements and tourism facilities for substitutes. If it is found necessary this can be implemented in this plan period on an experimental base.

Prescriptions for the supplementation of Animal Nutrients

The animal nutrients supplementing area shall be created near the vicinity of water holes and check dams, away from areas of human habitation.

- Regular monitoring of these areas and its consumption by wild animals can be useful for effective management interventions.
- Installation of camera traps near water holes and check dams.

CHAPTER 7

Eco-Tourism, Interpretation and Conservation Education

7.1 GENERAL

Eco-tourism and other forms of sustainable travel have much scope in the Anamudi Shola area. The boom of tourism in Munnar and other tourism centers of Idukki made a large-scale inflow of tourists and their desire to explore natural locations made eco-tourism desirable and ideal for the region. Eco-tourism was one of the major components adopted in the previous Management Plan for the sustainable management of the conservation activities of the Park.

Eco-tourism implemented in the Park include low impact travel to enjoy the scenic beauty and weather, trekking through designated areas in the Buffer zone, stay in the exotic locations and opportunities for the travelers / tourists to know about the physical landscape, nature education and need for conservation. Eco-tourism is a major source of funds for livelihood development of local communities without causing harm to environment and natural resources.

Based on the agreement signed between Kerala Forest Development Agency and M/S Stesalit Systems Ltd. a carrying capacity assessment and the present level of eco-tourism activities, was carried out in the year 2019. Estimation of carrying capacity for different eco-tourism activities offered at Shola National Park is based on the formula provided in the 2011 MoEFCC - Guidelines for eco-tourism in and around Protected Areas. At present the tourism operations is limited to stay in a stone house and a log house with single accommodation facility at Methappu and stone house with single accommodation facility at Perumala. The study recommended a trekking in the area. In view of the increasing tourist inflow in the last two years, opening of the watchtower near Methappu check post is proposed. The watchtower is under maintenance. The study recommends the closure of road through the Park. The study also pointed out that there is no waste management system in place and plastics are sometimes burnt for easy disposal. This practice should not be promoted and a waste treatment unit should be implemented at the earliest.

The current plan continue to emphasize conservation, provide enriching personal experiences and environmental awareness to tourists, allow low impact travel / trek, establish waste management unit and propose necessary interventions for improved social and cultural participation of the local communities, create avenues for income generation to local community, allocate necessary man power exclusively for eco-tourism operations and optimisation of income from the tourism infrastructure. All the activities undertaken in connection with eco-tourism during the current plan shall be in strict adherence to the basic principles set forth for such as;

- Minimize the impact of tourism on the Park, forest roads and the Protected Aera.
- Build respect and awareness on the environment, ecology, conservation of forest and Wildlife and cultural practices.
- Ensure that the tourism provides positive experiences for both the visitors and the local communities.
- Provide direct financial resource for conservation and protection activities of the Park.
- Provide avenues for alternate employment, economic benefits, empowerment and other benefits for local communities.

The existing facilities for environmental conservation awareness and nature based tourism at ASNP are a log house and a stone house at Methappu, and a stone house at Perumala. These facilities are functioning under Anamudi Shola Trekkers EDC. In order to accomplish the plan objectives, the following strategies are proposed.

7.2 OBJECTIVES

- To promote environmental conservation awareness.
- To facilitate eco-tourism activities

7.3 ISSUES AND PROBLEMS

- Absence of information centre and interpretation centre for the Park.
- Absence of trekking programs for the visitors.
- Absence of resource person / trained guides for conducting and co-ordinating conservation education and interpretation.
- Absence of nature education centre in the Park for conservation education.
- No exclusive staff for the management of eco-tourism. The protection staff is being used for tourism purpose which is an additional burden for them.
- Insufficient equipment and information material, like binocular, field guides etc. for the conservation education and interpretation.
- Insufficient awareness programs for the local community in their local language.
- Absence of scientific waste management system.
- Semi skilled and inexperienced guides.
- Absence of promotional activities, schemes etc. for optimising the output from eco-tourism.
- Absence of sale outlets/ eco-shops for forest produces.
- Absence of adequate toilets, refreshment rooms, clock room facility for tourists visiting the Park.

7.4 THE STRATEGIES

- Establish an information centre at Munnar and Marayoor.
- Introduce new trekking program at Perumala and Methappu with zero impact on the natural habitat.
- Examine the feasibility and viability of necessary additional infrastructure and facilities for nature education and interpretation centre for the Park and take necessary measures.
- Promotion of tourism facilities for optimising the revenue through appropriate media, information boards at checking stations at Chinnar, Munnar etc.
- Annual maintenance, proper upkeep of furniture, equipment, vehicles etc. and other facilities of the nature education centre and upgradation of the same from time to time.
- Develop appropriate eco-friendly hoardings and signage with Park specific content at strategic locations.
- Engage trained manpower for co-ordinating activities through AFDA.
- Procure adequate equipment such as binoculars, hiking pole etc. may be provided to the tourist by collecting a fee.
- Feasibility and viability of a sale outlet / eco-shop to be examined and take appropriate measures to optimize the income.

- Benefit sharing mechanism for tour operators for the benefit of the local people / forest dependent communities.
- Create awareness among local communities / visitors of the Park.
- Legal enforcement with fine to control littering in National Park.
- Engage EDC watchers for the removal of litters from the Park.
- Develop and implement a waste management plan for the Park.
- Annual subscription of websites
- Design and incorporate appropriate nature based tourism programs including the components like exposure to the cultural and sociological conditions of community and to the local cuisine of the fringe villages for ensuring livelihood security of forest dependant community.
- Recommends the setting up of committee including the Asst Wildlife Warden, eco-tourism manager, President and Secretary of the EDC to form a monitoring protocol for the effective management of eco-tourism facilities during this plan period.
- Streamlining and optimal use of the existing eco-tourism facilities are recommended instead of opening new sites / new programs. The Wildlife Warden shall conduct annual review of environmental conservation awareness programs and nature-based regulated tourism activities.

7.4.1 IDENTIFICATION OF ZONE

Tourism zone of the Park is already demarcated for tourism, interpretation and conservation education **(Figure 2.1).**

7.4.2 INFRASTRUCTURE DEVELOPMENT

- Re-open the watch tower for visitors after renovation.
- Centralized information centers at Munnar and Marayoor.
- Drinking water facilities, toilets, refreshment rooms, cloak rooms, etc. for the tourists at Perumala and Methappu.
- A nature education centre and interpretation centre at Perumala in an appropriate location for conducting nature education camps.
- Establishment of eco-shop at Kanthalloor.

7.4.3 REGULATIONS, MONITORING AND EVALUATION

For the successful and long-term management of eco-tourism, a regular feedback from all the participants involved is necessary. In this way, short comings of conflict between and among different groups could be sorted out. Measures for obtaining feedback from visitors, regular monitoring of the tourist inflow and income generated from eco-tourism, alternate livelihood opportunities etc, shall be implemented. Necessary steps to conduct periodical evaluation / studies on the of the impact of tourist on the Park, revenue generation through eco-tourism, impact of tourism on forest dependent communities, waste management system, visitor satisfaction, stakeholder participation etc. and appropriate measures for the smooth implementation of sustainable eco-tourism shall be taken.

7.4.4 INTERPRETATION AND PUBLICITY ACTIVITIES

- Green day celebrations by involving local people and nearby schools.

- Establish an interpretation center for the visitors with a nominal entry fee.
- Ensure the availability of public information / education material such as documentaries, books, guides, brochures, pamphlets, charts, maps, interactive games etc. for various age groups in different languages.
- Erect eco-friendly signage for conveying the importance of the Park, directions etc. along the roadside.
- Conduct outreach activities for students and communities

7.4.5 CONSERVATION EDUCATION

- Establish necessary infrastructure and facilities for conservation education.
- Follow a time plan for nature education camps.
- Programs to encouraging the stakeholder participation in eco-restoration activities.
- Training for staff and watchers on imparting nature education.
- Ensure the availability of education material such as documentaries, books, guides, brochures, pamphlets, charts, maps, interactive games etc. for various age groups.

7.5 KEY AREAS OF TOURISM POTENTIAL FOR DEVELOPMENT AND PROMOTION OF ECO-TOURISM

A Tourism zone is already demarcated for tourism, interpretation and conservation education and is depicted in **(Figure 2.1).**

7.6 PRESCRIPTIONS FOR ECO-TOURISM LOCATIONS

- The existing facilities shall be maintained during this plan period.
- Special focus shall be for maintaining and establishing safety measures for tourists and avoid disturbance to wildlife.
- It is proposed to prepare an eco-tourism plan separately for the Park in view with optimising revenue from the existing facilities, requirements of basic facilities, training, awareness and capacity building, waste management etc.
- Total ban on plastic (bags, bottles etc) shall be enforced in the Park. Fine may be imposed for discarding plastic waste in the eco-tourism sites and warning boards be erected against all waste deposition. Proper mechanism for waste collection shall be developed for all the eco-tourism sites. Recycling and management of wastes shall be done in accordance with the waste management plan of the Park. CCTV cameras shall be installed at various locations for intensification of surveillance. Legal action shall be taken against the defaulters. Suitable sign / direction / information boards shall be erected in eco-tourism sites and on the sides of prominent routes.

CHAPTER 8

Eco-development

8.1 GENERAL

The economic wellbeing and improvement of quality of life of indigenous community are vital components for the successful implementation of the plan. The responsible participation of local communities is essential in the protection of forest resources from fire, illegal grazing, poaching, hunting, extraction of minerals, felling, exploitation of natural wealth, etc. The major hurdles in maintaining the People-PA interface and strategies to strengthen the eco-development programs are described in this chapter.

There are three Muthuvan settlements inside the Park namely Koodallarkudi, Valsapettykudi and Swamiyaralakudi. These settlements are located in the North Eastern part of the Park. A Muthuvan tribal settlement called Kulachivayalkudi is also located adjoining to the Park. The individual rights as per the Forest Rights Act have been awarded to the tribal population (Swamiyaralakudi-75, Koodalarkudi-64 & Valsapettikudi-85) and the community resource rights needs to be settled in this plan period. A number of families have not yet submitted the application for individual rights and a necessary step in this regard is to be taken in the current plan period.

The tribes are cultivating winter vegetables like carrot, cabbage, beans etc. for sale and ragi (panjapullu) and some other varieties of millets for their domestic consumption. Rearing of live stock is also common. In all the settlements mild to moderate crop depredation by wild animals especially by wild boar, gaur and sambar deer are common. Presently there are four EDCs functioning in the Park, three Kudi EDCs and one operational EDC. The EDC members are mainly involved in protection and tourism activities of the Park. NWFP collected from the Park area by the tribes is sold through the eco-shop functioning under Pampadum Shola National Park. Local people are collecting the dried twigs, branches of exotic species like eucalyptus and black wattle as fire wood for their bonafide use. For strengthening the People-PA interface, the following strategies and activities are proposed.

8.2 OBJECTIVES

- To strengthen People-PA interface.
- To improve participatory forest conservation
- To enhance livelihood opportunities of forest dependent people

8.3 SPECIFIC ISSUES

- Human-Wildlife conflict
- Firewood collection
- NWFP collection

8.4 BROAD STRATEGIES

Identification of the needs / aspirations, natural and cultural resources of local community is required to evolve appropriate measures to strengthen the People-PA interface. Settlement of community rights under recognition of 'Forest Right Act 2006, channelizing / pooling the fund from various sources for the development of fringe communities, formation of a fringe EDC, organizing and conducting diverse / manifold programs to improve the relations with stakeholders etc. are recommended during the plan period. Facilitating the sustainability of drinking water and irrigation projects thereby ensuring sustainability of water, timely maintenance of pathways to tribal settlements facilitating movement of vehicles and services, marketing support for agricultural products of indigenous communities, alternate livelihood options in conservation activities, welfare programs, etc. are also proposed during the current plan period to strengthen the eco-development.

For mitigating the specific issues such as human-wildlife conflict, dependence on forest for firewood, NWFP collection etc. the following strategies are proposed.

8.4.1 HUMAN WILDLIFE CONFLICT

- Undertake appropriate habitat improvement programs within the Park for improving the availability of forage and water.
- Awareness programs in co-ordination with Agriculture and Horticultural Departments on safe farming practices and crops to reduce damage by wildlife.
- Electrical fencing, trenches, early elephant warning systems etc. by pooling of resources of LSGD, MNREGS.
- Timely assessment of damages caused by wildlife and payment of compensation.
- Introduction of crop insurance with the support of line departments.
- Undertake studies on the magnitude of human wildlife conflict and take necessary steps.
- Procure gadgets for rescue and rehabilitation of wild animals

8.4.2 ECO-RESTORATION

- Formation of a new EDC for eco-restoration activities in the Park.
- Study the impact of these exotic plantations inside the Park to the people.
- Permission for removal of exotic species with mutual commitment as part of removal of invasive plantation from the Park area in successive phases.

8.4.3 FIREWOOD COLLECTION

- Study the impact of firewood from the Park and take appropriate measures.
- Prevent the collection of indigenous species as fuel wood.
- Permission for removal of exotic species as firewood with mutual commitment as part of removal of invasive plantation from the Park area in successive phases.
- Awareness building on alternate energy sources to reduce dependency on forests.
- Provide alternate energy sources for reducing the demand for the fuel wood in co-ordination with line departments / NGOs / LSGD / Clubs.

8.4.4 NWFP COLLECTION

- A study on the threshold capacity of the NWFP of the Park.
- Define zone of collection and frame access rules for sustainable collection.
- Evolve scientific / sustainable practices for the collection of NWFP from the Park.
- Documentation of the seasonality and methods of NWFP collection.
- Training involving peer educators and stakeholders.
- Periodical monitoring and evaluation of NWFP collection.
- Settlement of community rights for NWFP collection.
- Infrastructure development for processing, storage and value addition of NWFP.
- Branding of products, sales promotion through eco-shops / supply chain shops / online platforms.

8.5 VILLAGE LEVEL SITE SPECIFIC STRATEGIES

The following village level specific strategies are proposed for strengthening the eco- development activities.

- Formation of fringe EDCs.
- Prepare micro plan for sustainable development of forest dependent communities.
- Marketing support / establishment of a weekly market for tribal communities of villages.
- Ensuring sustainable water supply to villages in coordination with line departments, LSGD, UNDP etc.
- Programs / amenities for general welfare of the people such as medical camps, livestock immunisation, library, community halls, sathram, valaymapura etc.

8.6 MONITORING AND EVALUATION

As per the previous Management Plan, the progress of the eco-development activities shall be monitored periodically based on the defined performance indicators. The monitoring indicators prescribed are;

a) **Ecological:** Biodiversity assessment, qualitative and quantitative evaluation of water sources, area under invasive species, restoration of the exotic plantation area etc.

b) **Social:** Dependency of the people on the Park, an access to basic amenities, alternative source of income, quality of education and livelihood.

c) **Institutional:** Working of the EDC, conflict resolution mechanism, involvement of line agencies.

Monitoring of developmental activities shall be done in order to assess the performance in terms of the above-mentioned indicators.

On evaluation of the eco-development activities during the previous plan period it is found that participatory approaches are likely to bring about improvement in this area. Responsible participation of the community depends more on the direct engagement of local leadership from the community. To enhance participation more informal avenues for interaction may be created. Need assessment through community meetings and interventions based on the priorities may be done. The initial resistance faced in gaining the communities trust was reconciled during in the previous Management Plan period. A gradual and ongoing effort is required in the current plan period to convince local communities on the possible benefits of good People-PA interface. Informal opportunities during meetings and workshops, improved participation in community celebrations, special occasions, etc. are important in strengthening the personal and working relationships with them. The result of the eco-development programs is often reflected in the tangible improvements / welfare amenities in the communities, improved market linkages, improvement in standard of living, alternate livelihood opportunities, empowerment of women in economic and livelihood, education, health seeking behavior, attitude towards conservation programs, regulations, restrictions, prohibitions, participation in meetings and activities, motivation to involve in the conservation activities mainly in the restoration works, number of violations, offenses reported etc.

CHAPTER 9

Research, Monitoring and Training

9.1 GENERAL

Research, monitoring and training play an integral role in the conservation of the Protected Aera. Research and monitoring has a key role in facilitating scientific interventions for effective conservation. It also helps to assess the success or failure of the activities / strategies / programs prescribed in the Management Plan. Research aids in addressing the challenges that arise in the course of the management of the Protected Aera (PA) and helps in achieving the goals. Large diversity of flora and fauna and high degree of endemism are characteristic features of the Park. The above features provide ample opportunities for researchers in exploring the biodiversity of Southern Montane Wet Temperate Forest, Grassland vegetation and the ecological roles associated with the ecosystem. The Park also serves as a field laboratory for activities like conservation education, research, monitoring and participatory management. In order to accomplish the plan objectives, the following research, monitoring and training are proposed.

9.2 RESEARCH AND MONITORING

9.2.1 BIODIVERSITY ASSESSMENT.

- Detailed studies on Bryophytes, Pteridophytes, Gymnosperms and Angiosperms present in the Park.
- Study the population dynamics of *Cyathea crinita* (Tree Fern).
- Research on the Strobilanthes species present in the Park, its distribution, habitat threat to Neelakurinji *(Strobilanthes kunthiana)* etc. and establish permanent plots for the long term monitoring of the species.
- Studies on the taxa present inside the National Park in accordance with the IUCN Redlist, CITES and WPA 1972.
- Biodiversity assessment of small mammals like rats, shrews and moles are needed, because the diversity of this category is in the Park is unknown to the world.
- Daily monitoring of wildlife and documentation.
- Annual camera trap exercise to be conducted in the landscape level to identify the movement pattern of large mammals.
- Study on the NilgiriTahr *(Nilgiritragus hylocrius* Ogilby, 1838*)* population present inside the National Park.
- Conduct detailed study regarding the small life forms especially the lesser studied invertebrates like ants, bees, wasps, cicadas, mantids and odonates inside the National Park.
- Population estimation and biodiversity assessment of all taxa at appropriate intervals
- Annual surveys of Birds, Butterflies, Odonates and Ants.
- To study the ecology, population trends and habitat utilization study of Nilgiri Marten (*Martes gwatkinsii)* (Horsfield, 1851), a vulnerable species according to IUCN, in the PA.
- Photographs of flora and fauna especially lower group animals present in the PA should be collected and an album containing such details to be kept.
- Need assessment for a temporary rescue centre for wildlife in distress.

- To maintain a biodiversity database (Digital and in hard copy) for the research works, publications and reports published in the light of studies conducted in the PA by researchers and the forest department.
- Studies on the impact of climate change and habitat shift of various species may be carried out during the plan period. Future conservation efforts can be identified based on the sensitivity and habitat suitability for the most vulnerable species.

9.2.2 HABITAT IMPROVEMENT

- Map the extent of the invasive species inside the Park.
- Identify the invasive and exotic species present in and around the National Park.
- Standardize suitable site / species specific method for the eradication of invasive species.
- Study the natural regeneration of the invasive species affected areas in the Park.
- Eco-friendly techniques and measures for the eradication of invasive plantations of the Park.
- Identify the suitable species for restoration including grass species.
- Standardise the procedure for collection of seeds, germination and hardening of seedlings of the selected species for eco-restoration.
- Establish permanent plot for the long term monitoring of the eco-restoration area.
- Study the impact of NWFP collection from the Park and make recommendations for sustainable collection.
- Scientific study will be done for evaluation of feasibility before the construction of new check dams inside the National Park.
- Scientific and sustainable collection of NWFP.
- To collaborate with appropriate governmental agencies and institutions with respect to bio-control and monitoring of invasive species.

9.3 MONITORING

- Monitor the movement of large mammals present in the Park.
- Regular monitoring of wildlife mortality.
- Develop a health monitoring protocol for wildlife in the Park and regular monitoring is recommended.
- Regular monitoring of water resources, check dams and its documentation.
- Annual Monitoring of the impact of forest fire in the Park.
- Monitor the regeneration and habitat use by the wildlife in the eco - restoration areas.
- Radio-collaring and monitoring of problematic animals.
- Install automatic weather stations at lower and higher camp and collect data regularly.
- Documentation of seasonality and methods of NWFP, analysis of samples and documentation.

- Record maintenance of researches, surveys, studies etc. at the Division level.
- Participation of local communities in conservation and protection activities.
- Monitoring of strategies adopted for fire prevention.
- Monitoring of strategies for optimising income from eco-tourism.
- Evaluation of livelihood promotion programs for local communities.
- Evaluation of the effectiveness of EDCs.
- Monitoring / Evaluation of eco-restoration programs.
- Qualitative and Quantitative analysis of habitat for studying the climate change.
- Study on the effectiveness of eco-restoration programs in the PA.
- Study on the suitable species, propagation and management in the eco - restoration areas.
- Habitat usage of eco-restoration areas by wildlife.
- Study the impact of eco-restoration on soil and water.
- Establish surveillance cameras in the restoration area.
- Regular wildlife population estimation.

a) Socio-economic studies

- Conduct a socio-economic survey at the tribal hamlets inside the National Park.
- Document the ethnic knowledge on flora and fauna.
- Monitor the health of the tribes annually.
- Identify and document the indigenous cultivating crops and establish a germplasm of the crop varieties.

9.4 TRAINING

- Training for staff and EDC members on intelligence gathering, identifying wildlife article, collection and handling of biological materials, identification of flora and fauna, wildlife census techniques, animal health monitoring, weapon handling, modern firefighting methods, participatory forest management, unarmed combat, acts and rules etc.
- Training to stake holders on scientific / sustainable collection of NWFP and value addition.
- Training for staff and EDC members on animal rescue operations and first aid.
- Training to EDC members on micro planning, accounting and management.
- Research, monitoring and training programs are documented and records shall be (Hard copy and Soft Copy) maintained at the office of the Wildlife Warden. A Resource room / library for proper systematic maintenance and upkeep of documents, and information gathered through surveys, census, research, studies, monitoring and evaluation reports etc is proposed. Engage necessary staff for the systematic maintenance and upkeep of the resource room.

- Training to different target groups like students, media persons, politicians and local peoples on nature awareness, water conservation and biodiversity.
- Conduct one day nature camps at the nearby schools.
- Establish a nature education centre or the PA.
- To bridge the skill gap and professional expertise and improve species literacy biodiversity applications assisted by modern technology is recommended, this will facilitate the conduct of surveys, population estimation, biodiversity assessment of specific areas, facilitate nature education, increased awareness on the native biodiversity etc. that fit to the working conditions of the PA.

Research, monitoring and training programs should be documented and recorded at division level. Engage a permanent staff to co-ordinate and monitor this and to provide the information to the Wildlife Warden and Assistant Wildlife Warden whenever necessary. Details of the permission granted for research for the past 10 years in the Shola National Park are annexed **(Annexure 3.5).**

CHAPTER 10

Organisation and Administration

10.1 STRUCTURE

The organizational structure of the Park is as shown below:

RESPONSIBILITIES

1. The Anamudi Shola National Park is functioning under the Wildlife Warden, Munnar who is responsible for the implementation of the Management Plan. The Wildlife Warden shall maintain a pocket field guide with schedule of operations for the implementation of Management Plan and furnish it to Assistant Wildlife Warden and Section Forester.
2. The Wildlife Warden shall make arrangements to supply the control forms to the Assistant Wildlife Warden and Section Forester and compile the information about the Park.
3. The Wildlife Warden, Munnar shall prepare Annual Plans of Operations and Schedule of Operations, in the first week of April every year.
4. The Wildlife Warden shall not deviate from the prescriptions of the Management Plan without the prior permission in writing of the Chief Wildlife Warden.
5. The Wildlife Warden shall also take action to review the Management Plan after five years.

10.2 STAFF AMENITIES

The staff of the Park has three Quarters of which one Beat Forest Officer quarters is at Perumala and one at Metahppu and other a Section Forest Officer quarters which is located at Kanthalloor. Presently these BFO quarters are functioning as check post. The following staff amenities currently exist in Anamudi Shola National Park **Table 10.1.**

TABLE 10.1: STAFF AMENITIES OF ANAMUDI SHOLA NATIONAL PARK

Sl No.	Name of building	Latitude	Longitude	Remarks
1	Section Forest Officer Quarters	10°12′4.12″N	77°11′33.11″E	Accommodation for Section forest officer
2	BFO Quarters at Methappu	10°10′51.72″N	77°11′36.25″E	Accommodation for BFOs and functioning as Checkpost
3	BFO Quarters at Methappu	10°10′51.72″N	77°11′36.25″E	Accommodation for BFOs and functioning as Checkpost

BUDGET

BUDGET OF ANAMUDI SHOLA NATIONAL PARK FROM 2020-21 TO 2030-31

Para. of Management plan	Activity	Financial requirements										Total (Lakh)
		1st year	2nd year	3rd year	4th year	5th year	6th year	7th year	8th year	9th year	10th year	
6.4.1.1	Survey of boundaries and construction cairns / pillars(8 km)	20	20	5	2	2					49	
6.4.1.1	Clearance or maintenance of boundary	3	3	3	3	3	3	3	3	3	3	**30**
6.3.2.1 IV	Eco-restoration of Areas Infested with Invasive Weeds like Eupatorium and Bracken fern etc.	2	2.5	3	1	1	2	2.5	3	1	2	**20**
6.3.2.1	Removal of plantation of exotic species for improvement of habitat and restoration of original vegetation	10	15	10	10	15	10	10	10	10	15	**115**
6.3.2.1	Assisting regeneration of indigenous species and eco-restoration	35	50	70	70	85	70	80	75	80	90	**705**
6.3.2.1	Establishment of permanent plots and monitoring successions and eco-restoration	2	3	3	4	2	1	2	3	4	3	**27**
6.3.2.1	Establishment of nursery for Eco-restoration work	15	20	25	30	35	15	20	25	30	35	**250**
6.4.1	Ganja raids	1	1	1	1	1	1	1	1	1	1	**10**
6.4.1.3	Engaging protection mazdoors	30	30	30	40	40	40	40	40	45	45	**380**
6.4.1.15 VII	Purchase of arms and ammunition	1		0.5		1.5		0.5				**3.5**
6.4.1.15 V	Purchase and maintenance of wireless system	5				0.5			1			**6.5**

6.4.1.15 VI	Purchase of new vehicles and maintenance	3.5	4	4.2	4.5	4.8	5	15	3	3	3	**50**
6.4.1.15 III	Maintenance of roads	5	5	5	5	5	10	5	10	5	5	**60**
6.4.1.15 IV	Maintenance of trek paths	7	7	7	10	10	11	12	13	14	15	**106**
6.4.1.15 II	Erection of chain gates and maintenance	3				1				0.5		**4.5**
6.4.1.13	Purchase of equipment, tents, composes, GPS, binoculars, Range Finder, Digital camera, Camera trap, radio colour, field kit for staff and watchers	5	1	1	1	1	1	1	1	1	1	**14**
6.4.1.4	Building Maintenance	5	2	2	5	3	3	8	2	2	10	**42**
6.4.1.4	New electricity connection for building and internet connectivity	5	5		1		5	5				**21**
6.4.1.3	Engaging mazdoors for anti-poaching activities	10	10	10	10	10	10	10	10	10	10	**100**
6.4.1.3	Uniform for protection mazdoors	1.5	2	3	1.5	4	5	5	2	4	3	**31**
6.4.1.3	Construction of new anti-poaching camp sheds	10	10	5	8	3	10	8	10	3	5	**72**
6.4.1.5	Conducting anti-poaching camps at differentareas in the National Park	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	**15**
6.4.1.5	Construction of Patrolling camp shed and watch tower, maintenance of existing patrolling camp sheds and watch tower	15	12	12	12	15	20	20	13	23	25	**167**

6.4.1.5	Construction of station building		25				10				10	**45**
6.4.1.13	Supply of tents, field gears including GPS, compass, binoculars, digital camera, torches, drone to field staffs	2	2	2	3	3	3	3	4	4	4	**30**
6.4.1.15 IX	Legal support in special cases	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	**5**
6.4.1.15 IX	Intelligence gathering and rewards to informers	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	**7.5**
6.4.1.4	Overhead and office expense	5	5	15	5	15	6	6	6	6	6	**75**
6.4.2.1	Preparation of fire management plan	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	**3**
6.4.2.2 I	Creation of firelines and maintenance	12	12	13.5	13.5	13.5	15	15	15	16.5	16.5	**142.5**
6.4.2.2 II	Controlled pre-burning	6	6	6	8	8	8	8	10	10	10	**80**
6.4.2.2 III	Engaging firewatchers during fire season	7	7	7	7	7	7	7	8.5	8.5	8.5	**74.5**
6.4.2.2 IV	Firebreak creation	70	70	70	70	70	10	10	10	10	10	**400**
6.4.2.2 V	Participatory fire management	5	5	3	3	2.5	2.5	2.5	2.5	2.5	2.5	**31**
6.4.2.2 VI, VII	Awareness of staff and EDC during fire season	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	**5**
6.4.2.2 VIII	Fire watch tower and maintenance	3	2	3	2	1.5	0.5	1	2	1	5	**21**
6.4.2.2 X	Impact Monitoring	0.5	0.5	0.5	1	1	1	1	1	1	1	**8.5**
6.4.2.2 IX	Purchase of firefighting equipment's (gum boots, fire resistant suit etc.)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	**15**
6.4.2.2 V	Meeting with stake holders	0.5	0.5	0.5	0.5	0.5	0.5	0.75	0.75	0.75	0.75	**6**
6.4.3 II	Conduct feasibility studies to retain water in crucial location inside and outside Protected Aera	0.5					0.5				1	**2**

6.4.3 II	Monitoring regeneration status and soil erosion	1	1	1	1	1	1	1	1	1	1	**10**
6.4.3	Maintenance and creation of water holes / check dams	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	**35**
6.4.3	Mapping of water resources and preparation of drainage map		0.75				1				1	**2.75**
6.4.3 II	Installation and maintenance of meteorological station	5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	**9.5**
6.4.3 II	Soil and moisture conservation measures (Gully plugging and bunds)	5	5	5	5	5	5	5	5	5	5	**50**
6.4.4	Mapping vegetation type in the National Park	2				2					3	**7**
6.4.4	Wildlife health monitoring	2	2	2	2	2	2	2	2	2	2	**20**
6.4.4	Documentation and population monitoring of flora and fauna including RET and endemics	1	1	1	1	2	2	2	2	3	3	**18**
6.4.4	Mapping of movement pattern of wild elephants	1	2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	**7**
6.4.4	Study to Identify invasive species that have negative impact on ecosystem	1	1	1	1	1	1	1	1	1	1	**10**
6.4.4	Monitoring of burned areas	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	**5**
6.4.4	Study the impact of controlled burning on the habitat utilization and distribution of small animals like amphibians	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	**5**

6.4.4	Regeneration status of RET and endemic flora	0.5		0.5		0.5		0.5		0.5		**2.5**
6.4.4	Long term monitoring of Shola & Grassland	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	**5**
7.4	Construction information centre at Munnar and Marayoor		50									**50**
7.4	Introduce new trekking program at Perumala and Methappu	6		3			3			3		**15**
7.4	Establish / Maintenance nature education and interpretation centre for the Park		25				3				3	**31**
7.4	Annual maintenance, proper upkeep of furniture, equipment, vehicles etc.	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	**7.5**
7.4	Develop appropriate and eco-friendly hoardings and signage with park specific content at strategic locations.	1			1			1			1	**4**
7.4	Procure adequate equipment such as binoculars, Hiking poles, etc. to the tourist.	2					2				2	**6**
7.4	Create awareness among local communitties / visitors of the park.	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	**5**
7.4	Develop and implement a waste management plan for the Park.	2				2						**4**
7.4	Design and incorporate appropriate nature based tourism programs		10	1	1	1	1	2	2	2	2	**22**
7.4.2	Reopen the watch tower for visitors after renovation		5				2				2	**9**

7.4.2	Drinking water facilities, Toilets, refreshment rooms, cloak rooms, etc. for the tourists at Perumala and Methapp.		15	1	1	1	1	1	1	1	1	**23**
7.4.2	Establishment of eco shop		20	1	1	1	1	1	1	1	1	**28**
7.4.4	Green day celebrations by involving local people and nearby schools	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1	**7.5**
7.4.4	Conduct outreach activities for students and communities	1	1	1	1	1	1	2	2	2	2	**14**
7.4.5	Programs to encouraging the stakeholder participation in Eco-restoration activities	1	1	1	1	2	2	2	2	3	3	**18**
7.4.5	Training for staff and watchers on imparting nature education	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	**5**
7.6	Establishing safety measures for tourists and avoid disturbance to wildlife	1		1		2		2			2	**8**
7.3	Establish waste management system		20	2	2	2	2	2	2	2	2	**36**
7.4	Awareness camps (including nature awareness camps)	8	8	8	8	10	10	10	10	10	10	**92**
7.4	Procurement of LCD, Computer for awareness camping	2				1.5						**3.5**
7.4	Annual subscription of website	0.5	0.5	0.6	0.6	0.7	0.7	0.8	0.8	0.9	1	**7.1**
8.4	Undertake appropriate habitat improvement programs within the Park for improving the availability of forage and water.	5	20	5	5	5	5	5	5	5	5	**65**

8.4	Training to staff on eco-development microplanning and visits to other sites	2	2	2	2	2	2	2	2	2	2	**20**
8.4	Preparation of micro plans for new EDC and renewal of existing micro plan of watchers EDC	1	0.5			1	0.5					**3**
8.4	Undertake studies on the magnitude of Human Wildlife Conflict and take necessary steps.	1		1		1		1		1		**5**
8.4	Construction of elephant proof trenches/ solar fences	10	2.5	2.5	2.5	3	3	3	3	3.5	3.5	**36.5**
8.4	Constitution of EDCs		2					1				**3**
8.4	Eco-development activity (as per micro plan)	4	1.5	1.5	1.5	1.5	2	2	2	2	2	**20**
8.4	Compensation against wildlife damage	5	5	5	5	5	7.5	7.5	7.5	7.5	7.5	**62.5**
8.4	Study the extent of wildlife damage problem				0.5					0.5		**1**
8.4	Purchase and maintenance of renewable energy system	10	2	2	2	2	2.5	2.5	2.5	3	3	**31.5**
8.4	A study on the threshold capacity of the NWFP of the Park & Evolve scientific / sustainable practices for the collection of NWFP	0.1		0.1		0.2		0.2		0.2		**0.8**
8.4	Study the impact of firewood collection from the Park and take appropriate measures.	0.1		0.1		0.2		0.2		0.2		**0.8**
8.4	Training involving peer educators and stakeholders.	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	**2**

	Infrastructure development for processing, storage and value addition of NWFP.	5	1	1	1	2	2	2	2	3	3	**22**
8.4	Documentation of the seasonality and methods of NWFP collection		1				1.5				10	**12.5**
8.4	Branding of products, sales promotio through eco-shops/ supply chain shops/online platforms.	2	1	1	1	1	1	1	1	1	2	**12**
9.2	Vaccination of domestic animals	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	**5**
9.2.1	Study the population dynamics of Cyathea crinita (Tree Fern).		2				2.5				2.5	**7**
9.2	Document flora and fauna including RET and endemic and its periodic survey	0.5	0.5	0.75	0.5	0.5	0.5	1	0.5	0.5	0.5	**5.75**
9.2	Study and identify invasive species that have negative impact on ecosystem			1.5								**1.5**
9.2	Study on elephant movements and connectivity		5	1	1	1	5	1	1	1	10	**26**
9.2.1	Study on the Strobilanthes species present in the Park, its distribution, habitat threat to Neelakurinji (Strobilanthes kunthiana) etc. and establish permanent plots for the long term monitoring of the species.		2	1	1	1	2	1	1	1	2.5	**12.5**
9.2.1	Biodiversity assessment of small mammals like rats, shrews and moles are needed, because the diversity of this category is the Park is unknown to the world.	1				1				1		**3**

9.2.1	Annual surveys of birds, butterflies,	1.5	1.5	1.5	1.5	1.5	1.5	2	2	2	2	**17**
9.2.1	Annual camera trap exercise to be conducted in the landscape level to identify the movement pattern of large mammals.	1	1	1	2	2	2	2	3	3	3	**20**
9.2.1	Study on the Nilgiri Tahr (Nilgiritragushylocrius Ogilby, 1838) population present inside the National Park.	2	2	2				3	3	3		**15**
9.2.1	To study the ecology, population trends and habitat utilization study of Nilgiri Marten Martes gwatkinsi (Horsfield, 1851), a vulnerable species according to IUCN, in the PA.	2	2	2	2	3	3	3	3	4	4	**28**
9.2.1	Photographs of flora and fauna especially lower group animals present in the PA should be collected and an album containing such details to be kept.	2	2				2				2	**8**
9.2.1	Conduct detailed study regarding the small life forms especially the lesser studied invertebrates like ants, bees, wasps, cicadas, mantids and odonates inside the National Park.	1	1	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	**6.5**
9.2.1	Temporary rescue centre for wildlife in distress		15	15	2	2	2	2	2	2	2	**44**
9.2.1	Maintain a biodiversity database (Digital and in hard copy) for the research works, publications and reports published in the light of studies conducted in the PA by researchers and the forest department	1	1	1	1	2	2	2	2	3	3	**18**

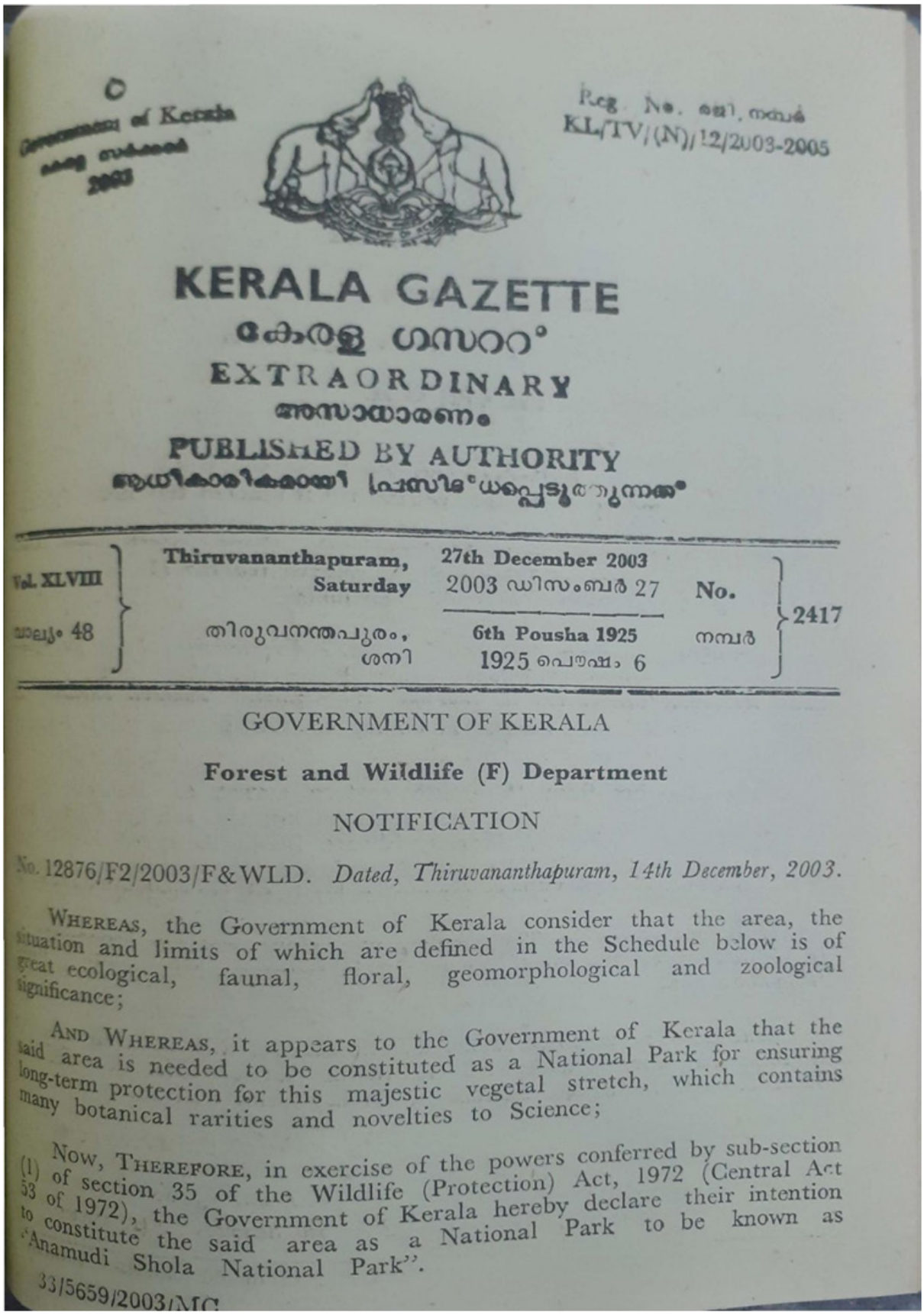
9.2.1	Studies on the impact of climate change and habitat shift of various species may be carried out during the plan period. Future conservation efforts **can be identified based on the** sensitivity and habitat suitability for the most vulnerable species.	2	2	2	3	3	3	3	4	4	4	**30**
9.2.1	Establish permanent plot for the long term monitoring of the eco-restoration area.	1	1	1	1	2	2	2	2	3	3	**18**
9.2.2	Scientific study will be done for evaluation of feasibility before the construction of new check dams inside the National Park.	2	2				3	3				**10**
9.2.2	Regeneration of NWFP and medicinal plantsin Red-data book		3		1.5		1.5		1.5		1.5	**9**
9.2.2	Planting of NWFP species in Homesteads	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	**15**
9.2	Study and document of traditional knowledge of indigenous communities			1.5				1.5			2	**5**
9.3	For procurements of gadgets for rescue and rehabilitation of wild animals	10	2.5	2.5	2.5	2.5	3	3	3	3	3	**35**
9.4	Training of scientific collection of NWFP and value addition		1				1.5				2	**4.5**
9.3	Wildlife population estimation	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	**7.5**
9.4	Training to staffs on weapon handling, firefighting, census techniques etc.	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	**5**

9.4	Training to staffs and EDC members on wildlife health monitoring, firefighting etc.	1	1	1	1	1	1	1	1	1	1	**10**
9.4	Capacity building of local communities for eco-tourism PROGRAMS	1.5	2	2	2	1.5	2	2	1.5	2	2	**18.5**
	Grand Total	**438.95**	**610**	**426**	**418.35**	**467.65**	**410.95**	**415.2**	**389.8**	**417.3**	**500**	**4494.2**

ANNEXURES

ANNEXURE 1.1

NOTIFICATION OF NATIONAL PARK



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Reg. No. കെ.എൽ.നമ്പർ KL/TV/(N)/12/2003-2005

KERALA GAZETTE

കേരള ഗസറ്റ്

EXTRAORDINARY

അസാധാരണം

PUBLISHED BY AUTHORITY

അധികാരികളാൽ പ്രസിദ്ധപ്പെടുത്തുന്നത്

Vol. XLVIII	Thiruvananthapuram, Saturday	27th December 2003	No. 2417
വാല്യം 48	തിരുവനന്തപുരം, ശനി	2003 ഡിസംബർ 27 / 6th Pousha 1925 / 1925 പൌഷം 6	നമ്പർ

GOVERNMENT OF KERALA

Forest and Wildlife (F) Department

NOTIFICATION

No. 12876/F2/2003/F&WLD. *Dated, Thiruvananthapuram, 14th December, 2003.*

WHEREAS, the Government of Kerala consider that the area, the situation and limits of which are defined in the Schedule below is of great ecological, faunal, floral, geomorphological and zoological significance;

AND WHEREAS, it appears to the Government of Kerala that the said area is needed to be constituted as a National Park for ensuring long-term protection for this majestic vegetal stretch, which contains many botanical rarities and novelties to Science;

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 Kerala hereby declare their intention to constitute the said area as a National Park to be known as "Anamudi Shola National Park".

33/5659/2003/MC

SCHEDULE

District : Idukki

Taluk : Devikulam

Village : Marayoor

Extent : 750 ha. (approximate)

Situation and limits of the said area

North:—Starting from Ottakombumala (hill point 2164) on the south western corner of Tirthalar proposed reserve forests, thence along the southern boundary of the said reserve till it reaches the north eastern corner of Mannavan Shola reserve thence along the north eastern boundary of the said reserve upto Madavarimala, thence north east along the southern boundary of Idivara Shola reserve passing along hill points 2153, 2104, 2199, 2132, 2127 (Velligirimala).

East:—Starting from hill point at 2127 (Velligirimala) runs along the eastern boundary of Idivara Shola Reserved Forest and Pullardi Shola Reserved Forest till it reaches the south eastern corner of Pullardi Shola Reserved Forests adjoining to the boundary of Kannan Devan Hills Village concession lands.

South:—Starting from the south eastern corner of Pullardi Shola Reserved Forest runs more or less south along the southern boundary of Pullardi Shola Reserved Forests, Idivara Shola Reserved Forest and Mannavan Shola Reserved Forests adjoining to the northern boundary of Kannan Devan Hills Village concession lands till it reaches Tirthamala.

West:—Starting from Tirthamala runs along eastern boundary of Mannavan Shola Reserved Forest till it reaches hill point 2164, Ottakombumala.

Remarks:—The proposed National Park includes all the areas notified as Reserved Forest under Idivara Shola Reserve No. 56, Pullardi Shola Reserve No. 57 and Mannavan Shola Reserve No. 58.

By order of the Governor,

LIZZIE JACOB,
Principal Secretary to Government.

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ANNEXURE 2.1

AVERAGE ANNUAL RAIN FALL DATA DURING THE LAST DECADES COLLECTED FROM NEARBY ESTATE OF ASNP

Division	2019/20	2018/19	2017/18	2016/17	2015/16	2014/15	2013/14	2012/13	2011/12	2010/11	2009/10
O.C.	1203.87	1542.79	1287.17	891.28	1057.4	837.43	991.87	602.74	826.77	838.96	857.25
North	1141.91	1383.03	992.31	698.24	885.19	1223.26	735.58	496.57	822.7	827.27	935.99
N.C.	1284.55	1585.97	1122.21	629.92	1009.65	1321.81	823.21	516.12	1070.86	798.06	999.99
South	1182.76	1507.23	1130.95	818.13	1231.9	1323.08	918.71	547.37	1004.82	839.97	909.57
Chittavurrai	**1203.2725**	**1504.755**	**1133.16**	**759.3925**	**1046.035**	**1176.395**	**867.3425**	**540.7**	**931.2875**	**826.065**	**925.7**

Source- Chittavurrai estate

ANNEXURE 2.2

AVERAGE ANNUAL TEMPERATURE DATA DURING THE LAST FOUR YEAR COLLECTED FROM NEARBY ESTATE OF ASNP

Month	2016		2017		2018		2019	
	Min	Max	Min	Max	Min	Max	Min	Max
January	4.5	24.2	2.3	22.3	3	23.8	0.4	22.9
February	5.9	24.7	1.4	22.6	3.5	23.6	5.2	23.1
March	6.8	26.3	5.9	23.6	5.7	19.7	6.4	24
April	8.1	26	6.2	25.4	6	24.2	7.9	25.9
May	10.4	26.7	7.4	25.5	6.2	25	10.4	25.8
June	9.6	26.1	7.3	25.3	5.8	24.9	12.2	24.7
July	8.7	26	5.8	27	13.8	23.3	12.1	24
August	7.9	25.1	6.8	26.6	13	24.2	13.3	24
September	8.1	25.4	7.3	26.9	9.4	24.5	11	24.1
October	8.5	25.3	7.3	27	7.3	24.2	10.2	23.4
November	6.3	23.6	5.8	25.6	9	21.9	8.9	22.1
December	4.6	20.4	3.9	24.5	6.3	21.7	8.9	21.9

Source- Chittavurrai estate

ANNEXURE 2.3

LOCATION OF WATER HOLES AND CHECK DAMS IN NATIONAL PARK

Sl No.	Name of water bodies	GPS		Dry Months
		Latitude	Longitude	
Ponds				
1	Iddalimotta	10.17027778	77.17555556	April
2	Pattuvirippin	10.18722222	77.16944444	March-April
3	Chengulam	10.19305556	77.18388889	April
4	Pedange	10.195	77.19166667	April
5	Perumala	10.20138889	77.19333333	All the Year
6	Isackadu	10.20277778	77.20111111	Nil
7	62_Plantetion	10.19277778	77.20277778	Nil
8	Rodovalley	10.20188889	77.20952778	Nil
9	Jandamala	10.18222222	77.21972222	Nil
Check Dams				
1	Hanumanthotty	10.19916667	77.18888889	Nil
2	Munnam mile	10.19333333	77.19	Nil
3	Onnamkurukku	10.19027778	77.18777778	Nil
4	Puthur	10.2	77.20083333	April
5	Thalachorkadavu	10.20416667	77.20777778	Nil
6	Rodovalley	10.20944444	77.20944444	April
7	Koodallar kudi area	10.20722222	77.21805556	April
8	Vettukadu	10.20916667	77.21777778	All the Year
9	Near Methappu-Koodallarkudy road	10.21444444	77.21666667	April
10	Pazhathottam	10.22916667	77.23611111	Nil

ANNEXURE 2.4

ANGIOSPERM OF ANAMUDI SOLA NATIONAL PARK

Sl.No.	Scientific Name	Family	Local Name	Status
1.	*Andrographis affinis* Nees	Acanthaceae		Endemic to WG
2.	*Andrographis lineata* Wall. ex Nees	Acanthaceae		Endemic to SWG
3.	*Rungia apiculata* Bedd.	Acanthaceae		
4.	*Rungia laeta* Clarke	Acanthaceae		Endemic to SWG
5.	*Strobilanthes anamallaica* Wood	Acanthaceae		Endemic to SWG
6.	*Strobilanthes andersonii* Bedd.	Acanthaceae		Endemic to SWG
7.	*Strobilanthes cuspidatus* (Benth.) Anders.	Acanthaceae	Kannarakurinji	Endemic to SWG
8.	*Strobilanthes decurrens* Nees	Acanthaceae		Endemic to SWG
9.	*Strobilanthes foliosus* (Wight) Anders.	Acanthaceae	Vettilakurinji	Endemic to PI
10.	*Strobilanthes gracilis* Bedd.	Acanthaceae	Thokakurinji	Endemic to SWG
11.	*Strobilanthes homotropus* Nees	Acanthaceae		Endemic to SWG
12.	*Strobilanthes kunthianus* (Nees) Anders. ex. Benth.	Acanthaceae	Neelakurinji	Endemic to PI
13.	*Strobilanthes lawsoni* Gamble	Acanthaceae		Endemic to SWG
14.	*Strobilanthes lupulinus* Nees	Acanthaceae		Endemic to PI
15.	*Strobilanthes luridus* Wight	Acanthaceae	Muttakanni-kurinji	Endemic to SWG

16.	*Strobilanthes micranthus* Wight	Acanthaceae	Kallankurinji	Endemic to SWG
17.	*Strobilanthes neilgherrensis* Bedd.	Acanthaceae		Endemic to SWG
18.	*Strobilanthes neoasper* Venu & Daniel	Acanthaceae		Endemic to WG
19.	*Strobilanthes papillosus* Anders.	Acanthaceae		Endemic to SWG
20.	*Strobilanthes pulneyensis* Hook. f.	Acanthaceae	Chonayam-kallukurinji	Endemic to SWG
21.	*Strobilanthes rubicundus* (Nees)	Anders	Acanthaceae	Endemic to SWG
22.	*Strobilanthes sessilis* Nees	Acanthaceae		Endemic to SWG
23.	*Strobilanthes tristis* (Wight) Anders.	Acanthaceae		Endemic to SWG
24.	*Strobilanthes urceolaris* Gamble	Acanthaceae	Panjikkurinji	Endemic to SWG
25.	*Strobilanthes wightianus* Nees	Acanthaceae		Endemic to SWG
26.	*Strobilanthes zenkerianus* Anders.	Acanthaceae		Endemic to SWG
27.	*Thunbergia tomentosa* Wall. ex Nees	Acanthaceae		
28.	*Achyranthes bidentata* Blume	Amaranthaceae	Nayaruvichedi	
29.	*Celosia pulchella* Moq.	Amaranthaceae		
30.	*Indobanalia thyrsiflora* (Moq.) Henry & Roy	Amaranthaceae		Endemic to SWG
31.	*Ancistrocladus heyneanus* Wall. ex Graham	Ancistrocladaceae	Modiravalli	
32.	*Meiogyne ramarowii* (Dunn) Gandhi	Annonaceae	Panthalmaram	Endemic to SWG
33	*Bupleurum mucronatum* Wight & Arn.	Apiaceae		

34.	*Bupleurum wightii* Kozo-Polj.	Apiaceae		
35.	*Heracleum candolleanum* Gamble	Apiaceae	Kattugeerakam	Endemic to SWG
36.	*Heracleum ceylanicum* Gardn. ex. Clarke	Apiaceae		
37.	*Heracleum rigens* Wall. ex DC.	Apiaceae	Chittelam	Endemic to SWG
38.	*Heracleum sprengelianum* Wight & Arn.	Apiaceae	Kattumalli	Endemic to WG
39.	*Hydrocotyle conferta* Wight	Apiaceae		VU, Endemic to SWG
40.	*Hydrocotyle sibthorpioides* Lam.	Apiaceae		
41.	*Pimpinella pulneyensis* Gamble	Apiaceae		Endemic to SWG
42.	*Vanasushava pedata* (Wight) P.K. Mukh. & Constance	Apiaceae		VU, Endemic to SWG
43.	*Ilex gardneriana* Wight	Aquifoliaceae		CR
44.	*Ilex walkeri* Wight & Gard. ex Thw.	Aquifoliaceae		
45.	*Ilex wightiana* Wall. ex Wight	Aquifoliaceae	Vellodi	
46.	*Arisaema barnesii* C.E.C. Fisch.	Araceae		Endemic to SWG
47.	*Arisaema leschenaultii* Blume	Araceae	Pambucholam	Endemic to SWG
48.	*Arisaema peltatum* C.E.C. Fisch.	Araceae		Endemic to SWG
49.	*Arisaema psittacus* Barnes	Araceae	Pambucholam	Endemic to SWG
50.	*Arisaema sarracenioides* Barnes & C.E.C. Fisch.	Araceae		Endemic to SWG
51.	*Arisaema tylophorum* C.E.C. Fisch.	Araceae		Endemic to WG

52.	*Aralia leschenaultii* (DC.) J. Wen	Araliaceae		Endemic to SWG
53.	*Polyscias acuminata* (Wight) Seem.	Araliaceae		Endemic to WG
54.	*Schefflera racemosa* (Wight) Harms	Araliaceae	Ettilamaram	
55.	*Ceropegia decaisneana* Wight	Asclepiadaceae		VU, Endemic to WG
56.	*Ceropegia maculata* Bedd.	Asclepiadaceae		
57.	*Gymnema montanum* (Roxb.) Hook. f.	Asclepiadaceae		
58.	*Hoya pauciflora* Wight	Asclepiadaceae		
59.	*Hoya wightii* Hook. f.	Asclepiadaceae	Ellodiyan	Endemic to SWG
60.	*Tylophora mollissima* Wight & Arn.	Asclepiadaceae		Endemic to SI
61.	*Tylophora tetrapetala* (Dennst.) Suresh	Asclepiadaceae	Nanjaippan	
62.	*Adenostemma lavenia* (L.) O. Ktze.	Asteraceae		
63.	*Ageratum conyzoides* L.	Asteraceae	Kumminni-pacha	
64.	*Anaphalis beddomei* Hook. f.	Asteraceae		VU, Endemic to SWG
65.	*Anaphalis bournei* Fyson	Asteraceae		Endemic to SWG
66.	*Anaphalis lawii* (Hook. f.) Gamble	Asteraceae		Endemic to PI
67.	*Anaphalis subdecurrens* (DC.) Gamble	Asteraceae		
68.	*Artemisia nilagarica* (Clarke) Pamp.	Asteraceae	Karpoora-thulasi	
69.	*Blumea oxyodonta* DC.	Asteraceae		

70.	*Chaetoseris cyanea* (D. Don) C. Shih	Asteraceae		
71.	*Cirsium wallichii* DC.var. *wightii* (Hook. f.) Vivek.	Asteraceae	Chakkumullu	
72.	*Cissampelopsis corymbosa* (Wall. ex DC.) Jeffrey & Chen.	Asteraceae		
73.	*Cissampelopsis walkeri* (Arn.) Jeffrey & Chen	Asteraceae		
74.	*Conyza canadensis* (L.) Cronq.	Asteraceae		
75.	*Dichrocephala integrifolia* (L. f.) O. Ktze.	Asteraceae		
76.	*Emilia scabra* DC.	Asteraceae	Poosha-thala	Endemic to India
77.	*Gnaphalium polycaulon* Pers.	Asteraceae		
78.	*Gynura travancorica* W. W. Smith	Asteraceae	Koppuchedi	Endemic to SWG
79.	*Hypochoeris glabra* L.	Asteraceae		
80.	*Launaea acaulis* (Roxb.) Babc. ex Kerr.	Asteraceae		
81.	*Moonia heterophylla* Arn.	Asteraceae		
82.	*Myriactis wightii* DC.	Asteraceae		CR
83.	*Phyllocephalum scabridum* (DC.) Kirkman	Asteraceae		Endemic to WG
84.	*Picris hieracioides* L.	Asteraceae		
85.	*Senecio lavandulaefolius* DC.	Asteraceae		Endemic to India
86.	*Vernonia anamallica* Bedd. ex Gamble	Asteraceae		VU, Endemic to SWG
87.	*Vernonia arborea* Buch.-Ham.	Asteraceae	Kadavari	

88.	*Vernonia bourneana* W. W. Smith	Asteraceae		Endemic to SWG
89.	*Vernonia fysonii* Calder	Asteraceae	Kaliyamman-pathiri	Endemic to SWG
90.	*Vernonia heynei Asteraceae* Bedd. ex Gamble			CR, Endemic to SWG
91.	*Vernonia salvifolia* Wight	Asteraceae		EN, Endemic to SWG
92.	*Vernonia travancorica* Hook. f.	Asteraceae	Karana, Thempu	Endemic to WG
93.	*Youngia japonica* (L.) DC.	Asteraceae		
94.	*Balanophora fungosa* J. R. & G. Forst.ssp. *indica* (Arn.) Hansen	Balanophoraceae	Nilamchakka	
95.	*Impatiens acaulis* Arn.	Balsaminaceae		
96.	*Impatiens campanulata* Wight	Balsaminaceae	Thottachinungi	Endemic to SWG
97.	*Impatiens clavicornu* Turcz.	Balsaminaceae		Endemic to WG
98.	*Impatiens cordata* Wight	Balsaminaceae	Thottachinungi	Endemic to WG
99.	*Impatiens cuspidata* Wight & Arn.	Balsaminaceae	Thottachinungi	Endemic to WG
100.	*Impatiens dasysperma* Wight	Balsaminaceae		EN,, Endemic to WG
101.	*Impatiens elegans Bedd.* Bedd.	Balsaminaceae		CR Endemic to SWG
102.	*Impatiens goughii Wight*	Balsaminaceae		Endemic to WG
103.	*Impatiens hensloviana* Arn.	Balsaminaceae		
104.	*Impatiens herbicola* Hook. f.	Balsaminaceae		VU, Endemic to SWG
105.	*Impatiens jerdoniae* Wight	Balsaminaceae		Endemic to WG

106.	*Impatiens latifolia* L.	Balsaminaceae		Endemic to SWG
107.	*Impatiens maculata* Wight	Balsaminaceae		Endemic to SWG
108.	*Impatiens modesta* Wight	Balsaminaceae		Endemic to SWG
109.	*Impatiens pallidiflora* Hook.f.	Balsaminaceae		EN, Endemic to SWG
110.	*Impatiens pandata* Barnes	Balsaminaceae		EN, Endemic to SWG
111.	*Impatiens parasitica* Bedd.	Balsaminaceae		Endemic to SWG
112.	*Impatiens phoenicea* Bedd.	Balsaminaceae		EN, Endemic to SWG
113.	*Impatiens scapiflora* Heyne ex Roxb.	Balsaminaceae		Endemic to WG
114.	*Impatiens tangachee* Bedd.	Balsaminaceae	Kannipoovu	Endemic to WG
115.	*Impatiens uncinata* Wight	Balsaminaceae		Endemic to SWG
116.	*Impatiens wightiana* Bedd.	Balsaminaceae		EN, Endemic to SWG
117.	*Begonia floccifera* Bedd.	Begoniaceae	Kalthamara	Endemic to SWG
118.	*Mahonia leschenaultii* (Wall. ex Wight & Arn.) Takeda ex Gamble	Berberidaceae	Mullumanjanathi	Endemic to SWG
119.	*Cardamine africana* L.	Brassicaceae		
120.	*Cardamine hirsuta* L.	Brassicaceae		
121.	*Sarcococca coriacea* (Hook.) Sweet	Buxaceae	Mattuvadi	Endemic to PI
122.	*Campanula alphonsii* Wall. ex A. DC.	Campanulaceae		VU, Endemic to WG
123.	*Viburnum coriaceum* Blume	Caprifoliaceae	Mottumookkan	

124.	*Spergula arvensis* L.	Caryophyllaceae		
125.	*Euonymus crenulatus* Wall. ex Wight & Arn.	Celastraceae	Dhanthapatri	Endemic to SWG
126.	*Microtropis ramiflora* Wight	Celastraceae		
127.	*Cyanotis papilionacea* (Burm. f.) Schult. f.	Commelinaceae		
128.	*Cyanotis thwaitesii* Hassk.	Commelinaceae		
129.	*Argyreia daltonii* Clarke	Convolvulaceae		Endemic to SI
130.	*Argyreia elliptica* (Roth) Choisy	Convolvulaceae	Adumbuvalli	
131.	*Argyreia imbricata* (Roth) Sant. & Patel	Convolvulaceae		Endemic to SI
132.	*Cuscuta krishnae Udayan,* Robi & Manudev	Convolvulaceae		Endemic to SWG
133.	*Mastixia arborea* (Wight) Bedd.	Cornaceae	Kattukarpooram	Endemic to SWG
134.	*Zehneria maysorensis* (Wight & Arn.) Arn. var. umbellata (Chakrav.) *Kumari* Cucurbitaceae			EN, Endemic to SWG
135.	*Bulbostylis barbata* (Rottb.) Kunth ex Clarke	Cyperaceae		
136.	*Carex filicina* Nees	Cyperaceae		
137.	*Schoenoplectus mucronatus* (L.) Palla	Cyperaceae		
138.	*Scleria pergracilis* (Nees) Kunth	Cyperaceae		
139.	*Daphniphyllum neilgherrense* (Wight) K. Rosenth	Daphnyphyllaceae	Kozhikkulamavu	
140.	*Drosera peltata* Smith	Droseraceae	Azhukanni	

141.	*Diospyros trichophylla* Alston	Ebenaceae		VU,
142.	*Elaeagnus kologa* Schult.	Elaeagnaceae	Kattumunthiringa	
143.	*Elaeocarpus munronii* (Wight) Mast.	Elaeocarpaceae	Kalrudraksham	Endemic to SWG
144.	*Elaeocarpus recurvatus* Corner	Elaeocarpaceae	Cholarudralksham	VU, Endemic to SWG
145.	*Elaeocarpus variabilis* Zmarzty	Elaeocarpaceae	Kotlampazha-maram	Endemic to WG
146.	*Gaultheria fragrantissima* Wall.	Ericaceae	Kolgatechedi	
147.	*Rhododendron arboreum* J. E. Smith ssp. nilagiricum (Zenk.) Tagg.	Ericaceae	VU Kattupoovarasu	Endemic to SWG
148.	*Eriocaulon brownianum* Mart. ex Wall.	Eriocaulaceae	Buttonpoovu	
149.	*Eriocaulon idukkianum* Manudev, Robi & Nampy	Eriocaulaceae		Endemic to SWG
150.	*Acalypha brachystachya* Hornem.	Euphorbiaceae		
151.	*Aporusa fusiformis* Thw.	Euphorbiaceae		
152.	*Euphorbia rothiana* Spreng.	Euphorbiaceae		
153.	*Drypetes venusta* (Wight) Pax & Hoffm.	Euphorbiaceae	Choota	Endemic to SWG
154.	*Drypetes wightii* (Hook. f.) Pax & Hoffm.	Euphorbiaceae	Vellakasavu	VU, Endemic to SWG
155.	*Excoecaria oppositifolia* Griff. var. *Crenulata* (Wight) Chakrab. & Gangop.	Euphorbiaceae	Era	
156.	*Glochidion candolleanum* (Wight & Arn.) Chakrab. & Gangop.	Euphorbiaceae	Chathakkadambu	
157.	*Glochidion ellipticum* Wight	Euphorbiaceae	Kulachan	
158.	*Casearia ovata (Lam.)* Willd.	Flacourtiaceae	Malampavatta	

159.	*Casearia rubescens* Dalz.	Flacourtiaceae		Endemic to SWG
160.	*Hydnocarpus alpina* Wight	Flacourtiaceae	Malamarotti	
161.	*Scolopia crenata* (Wight & Arn.) Clos	Flacourtiaceae	Mullukara	
162.	*Exacum anamallayanum* Bedd.	Gentianaceae		VU, Endemic to SWG
163.	*Exacum wightianum* Arn.	Gentianaceae	Thavalakkalchedi	Endemic to SWG
164.	*Gentiana quadrifaria* Blume var. *zeylanica* (Griseb.) Kusnezov	Gentianaceae		
165.	*Swertia corymbosa* (Griseb.) Wight ex Clarke in Hook.f.	Gentianaceae	Avalpoovu	Endemic to PI
166.	*Swertia minor* (Griseb.) Knobl.	Gentianaceae		Endemic to SWG
167.	*Aeschynanthus perrottetii* A.DC.	Gentianaceae		Endemic to WG
168.	*Didymocarpus tomentosa* Wight	Gentianaceae	Elichuzhien	Endemic to PI
169.	*Rhynchoglossum notonianum* (Wall.) Burtt	Gentianaceae		
170.	*Laurembergia coccinea* (Blume) Kanitz	Haloragaceae		
171.	*Hypericum japonicum* Thunb. ex Murr.	Hypericaceae		
172.	*Hypericum mysurense* Heyne ex Wight & Arn.	Hypericaceae	Avaramkola	
173.	*Apodytes dimidiata* Meyer ex Arn.	Icacinaceae	Karineeli	
174.	*Gomphandra coriacea* Wight	Icacinaceae	Chottamaram	
175.	*Nothapodytes nimmoniana* (Graham) Mabb.	Icacinaceae	Peenari	
176.	*Juncus bufonius* L.	Juncaceae		

177.	*Juncus inflexus* L.	Juncaceae		
178.	*Anisochilus argenteus* Gamble	Lamiaceae	Sheethakkoraali	VU, Endemic to SI
179.	*Isodon coesta* (Buch.-Ham. ex D. Don) Kudo	Lamiaceae		
180.	*Isodon lophanthoides* (Buch. -Ham. ex D.Don) H.Hara	Lamiaceae		Endemic to WG
181.	*Isodon nilgherricus* (Benth.) H.Hara	Lamiaceae		Endemic to SWG
182.	*Leucas chinensis* (Retz.) R. Br.	Lamiaceae		
183.	*Leucas helianthemifolia* Desf.	Lamiaceae		Endemic to PI
184.	*Leucas hirta* (Heyne ex Roth) Spreng.	Lamiaceae		Endemic to PI
185.	*Leucas lanceifolia* Desf.	Lamiaceae		Endemic to PI
186.	*Leucas vestita* Benth.	Lamiaceae	Hanumanpal	Endemic to SWG
187.	*Micromeria imbricata* (Forssk.) C.Chr.	Lamiaceae		
188.	*Plectranthus barbatus* Andr.	Lamiaceae	Panikoorka	
189.	*Pogostemon benghalensis* (Burm. f.) O. Ktze.	Lamiaceae	Bhoothachedayan	
190.	*Pogostemon mollis* Benth.	Lamiaceae		Endemic to WG
191.	*Pogostemon speciosus* Benth.	Lamiaceae		
192.	*Pogostemon wightii* Benth.	Lamiaceae		Endemic to SWG
193.	*Scutellaria violacea* Heyne ex Benth.	Lamiaceae		
194.	*Scutellaria wightiana* Benth.	Lamiaceae	Kattuthulasi	Endemic to PI

195.	*Actinodaphne bourdillonii* Gamble	Lauraceae	Malavirinji	Endemic to SWG
196.	*Actinodaphne salicina* Meisner	Lauraceae		EN, Endemic to SWG
197.	*Apollonias arnottii* Nees	Lauraceae	Karamavu	Endemic to SWG
198.	*Beilschmiedia wightii* (Nees) Benth. ex Hook. f.	Lauraceae	Nagaramaram	EN, Endemic to SWG
199.	*Cinnamomum perrottetii* Meisner	Lauraceae		VU, Endemic to SWG
200.	*Cinnamomum wightii* Meisner	Lauraceae	Shanthamaram	Endemic to SWG
201.	*Cryptocarya beddomei* Gamble	Lauraceae	Chembalava	VU, Endemic to SWG
202.	*Litsea floribunda* (Blume) Gamble	Lauraceae	Pattuthali	Endemic to WG
203.	*Litsea oleoides* (Meisner) Hook. f.	Lauraceae	Matthi	Endemic to SWG
204.	*Litsea udayanii* Robi	Lauraceae		Endemic to SWG
205.	*Litsea wightiana* (Nees) Hook.f.	Lauraceae	Pattuthali	Endemic to SWG
206.	*Litsea wightiana* (Nees) Hook. f. var. *tomentosa* (Meisner) Gamble	Lauraceae		Endemic to SWG
207.	*Neolitsea cassia* (L.) Kosterm.	Lauraceae	Keezhambazham	
208.	*Neolitsea fischeri* Gamble	Lauraceae	Varimaram	VU, Endemic to SWG
209.	*Neolitsea scrobiculata* (Meisner) Gamble	Lauraceae	Mulakunari	Endemic to WG
210.	*Machilus macrantha* Nees	Lauraceae	Kulamavu	
211.	*Machilus macrantha Neesvar.* brevifolia M.Gangop.	Lauraceae		Endemic to SWG
212.	*Phoebe wightii* Meisner	Lauraceae	Chudala	Endemic to PI

213.	*Asparagus gonoclados* Baker	Liliaceae	Sathavari	Endemic to WG
214.	*Chlorophytum heynei* Rottl. ex Baker	Liliaceae		
215.	*Chlorophytum sharmae* Adsul, Lekhak & S. R. Yadav	Liliaceae		Endemic to SWG
216.	*Dianella ensifolia* (L.) DC.	Liliaceae		
217.	*Disporum leschenaultianum* D. Don	Liliaceae		
218.	*Lilium wallichianum* Schult. & Schult. f. var. *neilgherrense* (Wight) Hara	Liliaceae	Thathapoovu	Endemic to SWG
219.	*Lobelia heyneana* Schult.	Lobeliaceae		
220.	*Lobelia nicotianifolia* Roth ex Roem. & Schult.	Lobeliaceae	Kattupukayila	
221.	*Fagraea ceilanica* Thunb.	Loganiaceae	Vellarimodakam	
222.	*Gardneria ovata* Wall.	Loganiaceae		
223.	*Dendrophthoe memecylifolia* (Wight & Arn.) Danser	Loranthaceae		Endemic to SWG
224.	*Helixanthera obtusata* (Schult.) Danser	Loranthaceae		Endemic to WG
225.	*Taxillus tomentosus* (Heyne ex Roth) Tieghem	Loranthaceae		
226.	*Rotala indica* (Willd.) Koehne	Lythraaceae		
227.	*Magnolia nilagirica* (Zenk.) Figlar	Magnoliaceae	Kattuchempakam	
228.	*Abelmoschus angulosus* Wall. ex Wight & Arn.	Malvaceae	Kattukasthuri	
229.	*Urena lobata* L.	Malvaceae	Uthiram	
230.	*Medinilla beddomei* Clarke	Melastomataceae		Endemic to SWG

231.	*Medinilla malabarica* Bedd.	Melastomataceae		VU, Endemic to SWG
232.	*Medinilla sahyadrica* Sujanapal & Sasidh.	Melastomataceae		Endemic to SWG
233.	*Memecylon wightii* Thw.	Melastomataceae		
234.	*Osbeckia aspera* (L.) Blume	Melastomataceae		
235.	*Osbeckia leschenaultiana* DC.	Melastomataceae	Nailangi	Endemic to SWG
236.	*Sonerila brunonis* Wight & Arn.	Melastomataceae		
237.	*Sonerila devicolamensis* Nayar	Melastomataceae		Endemic to SWG
238.	*Sonerila grandiflora* R. Br. ex Wight & Arn.	Melastomataceae		VU, Endemic to SWG
239.	*Aglaia apiocarpa* (Thw.) Hiern	Meliaceae		VU,
240.	*Aglaia perviridis* Hiern	Meliaceae	Karakil	VU,
241.	*Aphanamixis polystachya* (Wall.) Parker	Meliaceae	Chemmaram	
242.	*Chukrasia tabularis* A. Juss.	Meliaceae	Chuvannakil	
243.	*Cipadessa baccifera* (Roth) Miq.	Meliaceae	Potti	
244.	*Dysoxylum binectariferum* (Roxb.) Hook. f. ex Bedd	Meliaceae	Akil	
245.	*Dysoxylum ficiforme* (Wight) Gamble	Meliaceae	Puvilakil	VU,
246.	*Trichilia connaroides* (Wight & Arn.) Bentv.	Meliaceae	Thirivembu	
247.	*Cocculus laurifolius* DC.	Menispermaceae	Aadukolli	
248.	*Cyclea fissicalyx* Dunn	Menispermaceae		EN, Endemic to SWG

249.	*Stephania japonica Miers* (Thunb.)	Menispermaceae	Paasichedi	
250.	*Ficus laevis Blumevar.* macrocarpa (Miq.) Corner	Moraceae	Peyathi	Endemic to SWG
251.	*Ficus talbotii* King	Moraceae	Vellayal	
252.	*Ardisia blatteri* Gamble	Myrsinaceae		EN, Endemic to SWG
253.	*Ardisia rhomboidea* Wight	Myrsinaceae		Endemic to SWG
254.	*Embelia ribes* Burm. f.	Myrsinaceae	Vizhalari	
255.	*Maesa indica* (Roxb.) DC.	Myrsinaceae	Kattuvizhal	
256.	*Rapanea capitellata* (Wall.) Mez	Myrsinaceae		
257.	*Rapanea thwaitesii* Mez	Myrsinaceae	Cheeramaram	EN, Endemic to WG
258.	*Eucalyptus globulus* Labill.	Myrtaceae	Yukkalimaram	
259.	*Eucalyptus grandis* Hill ex Maid.	Myrtaceae	Grandis	
260.	*Rhodomyrtus tomentosa* (Sol. ex Ait.) Hassk.	Myrtaceae	Cherukotlam-pazham	
261.	*Syzygium cumini* (L.) Skeels	Myrtaceae	Valiyanjaval	
262.	*Syzygium densiflorum* Wall. ex Wight & Arn.	Myrtaceae	Kurunjaval	VU, Endemic to SWG
263.	*Syzygium hemisphericum* (Wight) Alston	Myrtaceae	Tholnjaval	
264.	*Syzygium sahyadricum* Sujanapal, Robi & Sasidh.	Myrtaceae	Pillanjaval	VU, Endemic to SWG
265.	*Chionanthus mala-elengi* (Dennst.) P. S. Green ssp. *linocieroides* (Wight) P. S. Green	Oleaaceae		EN, Endemic to SWG

266.	*Chionanthus ramiflorus* Roxb.	Oleaaceae	Kaattuchakkalathi	
267.	*Jasminum brevilobum* A. DC.	Oleaaceae	Kattumulla	Endemic to PI
268.	*Ligustrum perrottetii* A. DC.	Oleaaceae	Kathikodimaram	Endemic to WG
269.	*Olea paniculata* R. Br.	Oleaaceae		
270.	*Circaea alpinia L.ssp. imaicola* (Asch. & Magn.) Kitamura	Onagraceae		
271.	*Oenothera laciniata* Hill	Onagraceae		
272.	*Aerides ringens* (Lindl.) C.E.C. Fisch.	Orchidaceae		
273.	*Brachycorythis iantha* (Wight) Summerh.	Orchidaceae		Endemic to India
274.	*Brachycorythis splendida* Summerh.	Orchidaceae		Endemic to SWG
275.	*Bulbophyllum acutiflorum* A. Rich.	Orchidaceae		Endemic to SI
276.	*Bulbophyllum fischeri* Seidenf.	Orchidaceae		
277.	*Bulbophyllum* fuscopurpureum Wight	Orchidaceae		Endemic to SWG
278.	*Calanthe triplicata* (Willem.) Ames	Orchidaceae		
279.	*Cymbidium aloifolium* (L.) Sw.	Orchidaceae		
280.	*Dendrobium anamalayanum* Chandra.	Orchidaceae		Endemic to SWG
281.	*Dendrobium nanum* Hook.f.	Orchidaceae		Endemic to SWG
282.	*Habenaria perrottetiana* A. Rich.	Orchidaceae		Endemic to SI
283.	*Oberonia sebastiana* Shetty & Vivek	Orchidaceae		Endemic to SWG

284.	*Aeginetia pedunculata* Wall.	Orobanchaceae		
285.	*Christisonia tubulosa* (Wight) Benth. ex Hook. f.	Orobanchaceae	Yellow Ghost Flower	Endemic to SWG
286.	*Biophytum intermedium* Wight	Oxalidaceae		
287.	*Biophytum sensitivum* (L.) DC. var. *candolleanum* (Wight) Edgew. & Hook.f.	Oxalidaceae	Mukkutti	
288.	*Oxalis corniculata* L.	Oxalidaceae	Puliyarila	
289.	*Parnassia mysorensis* Heyne ex Wight & Arn.	Parnassiaceae		
290.	*Decaloba leschenaultii* (DC.)M.Roem.	Passifloraceae	Seemavellari	Endemic to PI
291.	*Pinus patula* Schl. & Cham.	Pinaceae		
292.	*Lepianthes umbellata* (L.) Rafin.	Piperaceae	Panniperuvelam	
293.	*Peperomia heyneana* Miq.	Piperaceae		
294.	*Peperomia tetraphylla* (G.Forst.) Hook. & Arn.	Piperaceae		
295.	*Piper mullesua* Buch.-Ham. ex D. Don	Piperaceae		
296.	*Piper schmidtii* Hook.f.	Piperaceae		Endemic to SWG
297.	*Piper wightii* Miq.	Piperaceae		Endemic to SWG
298.	*Pittosporum napaulense* (DC.) Rehder & Wilson	Pittosporaceae	Kasumaram	
299.	*Pittosporum tetraspermum* Wight & Arn.	Pittosporaceae	Analivegam	
300.	*Plantago erosa* Wall.	Plantaginaceae	Njaramboori	
301.	*Polygala arillata* Buch.-Ham. ex D. Don	Polygalaceae		

302.	*Clematis gouriana* Roxb. ex DC.	Ranunculaceae	Nikidakodi	
303.	*Clematis munroiana* Wight	Ranunculaceae		Endemic to WG
304.	*Clematis wightiana* Wall. ex Wight & Arn.	Ranunculaceae		Endemic to WG
305.	*Rhamnus wightii* Wight & Arn.	Rhamnaceae	Kokkuvalli	
306.	*Photinia integrifolia* Lindl. var. sublanceolata Miq.	Rosaceae	Choluvan	
307.	*Prunus ceylanica* (Wight) Miq.	Rosaceae	Attanaripongu	
308.	*Rosa leschenaultiana* Red. & Thory ex Wight & Arn.	Rosaceae	Kaatturosa	Endemic to SWG
309.	*Rubus ellipticus* Smith	Rosaceae	Mullippazham	
310.	*Rubus glomeratus* Blume	Rosaceae	Mulluvettila	Endemic to PI
311.	*Rubus niveus* Thunb.	Rosaceae	Karimcheechi	
312.	*Canthium rheedei* DC.	Rubiaceae	Edalimaram	Endemic to PI
313.	*Hedyotis devicolamensis* Deb & Dutta	Rubiaceae		Endemic to SWG
314.	*Ixora notoniana* Wall. ex G. Don	Rubiaceae	Iramburippi	Endemic to SWG
315.	*Lasianthus parvifolius* Wight	Rubiaceae		Endemic to SWG
316.	*Lasianthus venulosus* (Wight & Arn.) Wight	Rubiaceae		Endemic to SWG
317.	*Mussaenda tomentosa* Wight ex Wall.	Rubiaceae	Pattam	Endemic to SWG
318.	*Neanotis longiflora* (Hutch.) Lewis	Rubiaceae		Endemic to SWG
319.	*Ophiorrhiza grandiflora* Wight	Rubiaceae		Endemic to SWG

320.	*Psychotria anamalayana* Bedd.	Rubiaceae		Endemic to SWG
321.	*Psychotria macrocarpa* Hook. f.	Rubiaceae		VU, Endemic to SWG
322.	*Psychotria nilgiriensis* Deb & Gangop. var. *astephana* (Hook. f.) Deb & Gangop.	Rubiaceae	Pavadakkambu	Endemic to SWG
323.	*Saprosma foetens* (Wight) K. Schum.	Rubiaceae	Theenari	Endemic to SWG
324.	*Tarenna alpestris* (Wight) Balakr.	Rubiaceae		Endemic to SWG
325.	*Acronychia pedunculata* (L.) Miq.	Rutaceae	Orilatheeppetti-maram	
326.	*Murraya paniculata* (L.) Jack.	Rutaceae	Naaragamulla	
327.	*Meliosma pinnata* (Roxb.)Maxim. ssp. *barbulata* (Cufod.) Beus.	Sabiaceae	Thakiri	
328.	*Meliosma simplicifolia* (Roxb.) Walp.	Sabiaceae	Kallavi	
329.	*Dimocarpus longan* Lour.	Sapindaceae	Chempoovam	
330.	*Isonandra perrottetiana* A. DC.	Sapotacaeae	Karimpala	Endemic to SWG
331.	*Xantolis tomentosa* (Roxb.) Rafin.	Sapotacaeae	Mullupala	
332.	*Solanum capsicoides* All.	Solanaceae	Rakthachunda	
333.	*Solanum giganteum* Jacq.	Solanaceae		
334.	*Solanum mauritianum* Scop.	Solanaceae		
335.	*Solanum pseudo-capsicum* L.	Solanaceae	Jerusalem cherry	
336.	*Solanum violaceum* Ortega ssp. *multiflorum* (Clarke) Matthew	Solanaceae	Cheruvazhuthana	
337.	*Turpinia cochinchinensis* (Lour.) Merr.	Staphyleaceae	Pambaravetti	

338.	*Symplocos anamallayana* Bedd.	Symplocaceae		EN, Endemic to SWG
339.	*Symplocos monantha* Wight	Symplocaceae		Endemic to SWG
340.	*Eurya japonica* Thunb.	Theaceae	Kooramar	
341.	*Eurya nitida* Korth.	Theaceae	Arruttuvarai	
342.	*Gordonia obtusa* Wall.ex Wight & Arn.	Theaceae	Kattukarana	
343.	*Ternstroemia gymnanthera* (Wight & Arn.) Bedd.	Theaceae		
344.	*Gnidia glauca* (Fresen.) Gilg	Thymeleaceae	Nanju	
345.	*Celtis philippensis.* Blanco var. *wightii* (Planch.) Soep	Ulmaceae	Paalpatani	
346.	*Celtis tetrandra* Roxb.	Ulmaceae	Poochakkuru-maram	
347.	*Debregeasia longifolia* (Burm. f.) Wedd.	Urticaceae	Poonoolmaram	
348.	*Debregeasia wallichiana* (Wedd.) Wedd.	Urticaceae		
349.	*Elatostema sessile* J.R. Forst. & J.G.A. Forst.	Urticaceae		
350.	*Elatostema wightii* Hook. f.	Urticaceae		Endemic to SWG
351.	*Girardinia diversifolia* (Link) Friis	Urticaceae	Aanachoriyanam	
352.	*Lecanthus peduncularis* (Wall. ex Royle) Wedd.	Urticaceae		
353.	*Pellionia heyneana* Wedd.	Urticaceae	Nilampatti	
354.	*Pilea melastomoides* (Poir.) Blume	Urticaceae	Narali	
355.	*Pouzolzia auriculata* Wight	Urticaceae	Parapodukki	

356.	*Pouzolzia wightii* Bennett var. *scabra* (Wight) C.E.C. Fisch.	Urticaceae	Naralikola	Endemic to SI
357.	*Procris crenata* Robins.	Urticaceae	Tambu	
358.	*Vaccinium leschenaultii* Wight	Vacciniaceae	Kalavu	Endemic to SWG
359.	*Vaccinium neilgherrense* Wight	Vacciniaceae	Manalamaram	Endemic to SWG
360.	*Valeriana leschenaultii* DC.	Valerianaceae		Endemic to SWG
361.	*Callicarpa tomentosa* (L.) L.	Verbenaceae	Naikumbil	
362.	*Clerodendrum infortunatum* L.	Verbenaceae	Vattapparuvalam	
363.	*Viola betonicifolia* J.E. Smith	Violaceae		
364.	*Korthalsella japonica* (Thunb.) Engl.	Viscaceae		
365.	*Viscum angulatum* Heyne ex DC.	Viscaceae		
366.	*Parthenocissus semicordata* (Wall.)Planch.var. *roylei* (King) Raiz. & Saxena	Vitaceae		
367.	*Tetrastigma leucostaphylum* (Dennst.) Alston ex Mabb.	Vitaceae	Seenkaikkodi	
368.	*Xyris capensis* Thunb.	Xyridaceae		
369.	*Alpinia abundiflora* Burtt & R.M. Smith	Zingiberaceae	Kattuelam	
370.	*Amomum hypoleucum* Thw.	Zingiberaceae		
371.	*Globba schomburgkii* Hook.f.	Zingiberaceae		
372.	*Hedychium venustum* Wight	Zingiberaceae		Endemic to WG

WG- Western Ghats, **SWG**- Southern Western Ghats, **SI-** South India, **PI**- Peninsular India, **VU**- Vulnerable, **CR**- Critically Endangered, **EN**- Endangered.

ANNEXURE 2.5

FERNS OF ANAMUDI SHOLA NATIONAL PARK

Sl.No.	Name	Family	Status
1.	*Adiantum raddianum*	Adiantaceae	Common
2.	*Arachniodes aristata*	Dryopteridaceae	Common
3.	*Asplenium zenkeranum*	Aspleniaceae	Rare
4.	*Cyathea nilgirensis*	Cyatheaceae	Rare, Endemic
5.	*Cyclosorus parasiticus*	Thelypteridaceae	Common
6.	*Diplazium esculentum*	Woodsiaceae	Common
7.	*Leptochilus deccurens*	Polypodiaceae	Common
8.	*Nephrolepis auriculata*	Lomariopsidaceae	Common
9.	*Pteridium aquilinum*	Denstaedtiaceae	Common
10.	*Pteris confusa*	Pteridaceae	Common
11.	*Pteris cretica*	Pteridaceae	CR
12.	*Pteris multiaurita*	Pteridaceae	EN,
13.	*Pteris perrotteti*	Pteridaceae	EN,, Endemic
14.	*Pyrrosia beddomei*	Polypodiaeae	Rare
15.	*Selaginella involvens*	Selaginellaceae	Rare
16.	*Vittaria elongata*	Pteridaceae	Common

ANNEXURE 2.6

MAMMALS OF ANAMUDI SHOLA NATIONAL PARK

Sl. No.	Scientific Name	Family	Common Name	IUCN	END	WPA
1	*Elephas maximus*	Elephantidae	Asian Elephant	EN		Sch. I (Part I)
2	*Macaca radiata*	Cercopithecidae	Bonnet Macaque	LC		Sch. II (Part I)
3	*Trachypithecus johnii*	Cercopithecidae	Nilgiri Langur	VU	WG	Sch. I (Part I)
4	*Herpestes fuscus*	Herpestidae	Brown Mongoose	LC		Sch. II (Part II)
5	*Herpestes vitticollis*	Herpestidae	Stripe-necked Mongoose	LC		Sch. II (Part II)
6	*Lepus nigricollis*	Leporidae	Black-napped Hare	LC		Sch. IV
7	*Paradoxurus jerdoni*	Viverridae	Brown Palm Civet	LC	WG	Sch. II (Part II)
8	*Viverricula indica*	Viverridae	Small Indian Civet	LC		Sch. II (Part II)
9	*Panthera pardus*	Felidae	Common Leopard	VU		Sch. I (Part I)
10	*Prionailurus bengalensis*	Felidae	Leopard Cat	LC		Sch. I (Part I)
11	*Panthera tigris*	Felidae	Tiger	EN		Sch. I (Part I)
12	*Funambulus sublineatus*	Sciuridae	Dusky-Stripped Palm Squirrel	VU	WG	Sch. IV & SL
13	*Ratufa indica*	Sciuridae	Malabar Giant Squirrel	LC		Sch. II (Part II)
14	*Bos gaurus*	Bovidae	Gaur	VU		Sch. I (Part I)
15	*Nilgiritragus hylocrius*	Bovidae	Nilgiri Tahr	EN	WG	Sch. I (Part I)
16	*Moschiola indica*	Tragulidae	Indian Chevrotain (Mouse Deer)	LC		Sch. I (Part I)
17	*Hystrix indica*	Hystricidae	Indian Crested Porcupine	LC		Sch. IV

18	*Martes gwatkinsii*	Mustelidae	Nilgiri Marten	VU	WG	Sch. II (Part II)
19	*Rusa unicolor*	Cervidae	Sambar deer	VU		Sch. III
20	*Muntiacus muntjak*	Cervidae	Southern Red Muntjac (Barking Deer)	LC		Sch. III
21	*Melursus ursinus*	Ursidae	Sloth Bear	VU		Sch. I (Part I)
22	*Sus scrofa*	Suidae	Wild Boar	LC		Sch. III
23	*Cuon alpinus*	Canidae	Wild dog	EN		Sch. II (Part I)
24	*Cynopterus sphinax Pteropodidae*		Short-nosed Fruit Bat	LC		Sch. V
25	*Megaderma spasma Megadermatidae*		Lesser False Vampire Bat	LC		
26	*Rhinolophus lepidus*	Rhinolophidae	Blyth's Horse-shoe Bat	LC		
27	*Rhinolophus indorouxii*	Rhinolophidae	Rufous Horse-shoe Bat	DD		
28	*Hipposideros speoris*	Hipposideridae	Schneider's Leaf-nosed Bat	LC		
29	*Hipposideros pomona*	Hipposideridae	Anderson Leaf-nosed Bat	LC		
30	*Myotis horsfieldii*	Vespertilionidae	Horsefieldi's Bat	LC		
31	Kerivoula spp.1	Vespertilionidae				

LC: Least Concerned; **VU**-Vulnerable; **EN-**Endangered; **DD -** Data Deficient; **IUCN**-International Union for Conservation of Nature and Natural resources; **WPA -** Wildlife Protection Act; **END -** Endemic; **Sch.:** Schedule; **WG-** Western Ghats; **SL-** Sri Lanka

ANNEXURE 2.7

BIRDS OF ANAMUDI SHOLA NATIONAL PARK

No	English Name	Species name	IUCN	END	WPA
1	Indian Peafowl	*Pavo cristatus* (Linnaeus, 1758)	LC		Sch. I
2	Common Quail	*Coturnix coturnix coturnix* (Linnaeus, 1758)			Sch. IV
3	Grey Junglefowl	*Gallus sonneratii* (Temminck, 1813)	LC		Sch. II
4	Red Spurfowl	*Galloperdix spadicea* (Gmelin, JF, 1789)	LC		Sch. IV
5	Nilgiri Wood Pigeon	*Columba elphinstonii* (Sykes, 1832)	VU	WG	Sch. IV
6	Spotted Dove	*Streptopelia chinensis* (Scopoli, 1786)	LC		Sch. IV
7	Pompadour / Grey - Fronted Green Pigeon)	*Treron pompadora* (Gmelin, 1789)	LC		Sch. IV
8	Emerald Dove	*Chalcophaps indica* (Linnaeus, 1758)	LC		Sch. IV
9	Mountain / (Nilgiri Imperial Pigeon)	*Ducula badia* (Raffles, 1822)	LC		Sch. IV
10	Jerdon's Nightjar	*Caprimulgus atripennis* (Jerdon, 1845)	LC		Sch. IV
11	Indian Swiftlet/ Edible Nest Swiftlet	*Aerodramus unicolor* (Jerdon, 1840)	LC		Sch. I
12	Asian Palm Swift	*Cypsiurus balasiensis* (Gray, JE, 1829)	LC		
13	Alpine Swift	*Tachymarptis melba* (Linnaeus, 1758)	LC		
14	Pacific Swift (Blyth's Swift)	*Apus pacificus* (Blyth, 1845)	LC		Sch. IV
15	Indian House Swift (Little Swift)	*Apus affinis* (Gray, JE, 1830)	LC		
16	Greater Coucal	*Centropus sinensis* (Stephens, 1815)	LC		Sch. IV

17	Indian Pond Heron	*Ardeola grayii* (Sykes, 1832)	LC		Sch. IV
18	Cattle Egret	*Bubulcus ibis* (Boddaert, 1783)	LC		Sch. IV
19	Red-Wattled Lapwing	*Vanellus indicus* (Boddaert, 1783)	LC		Sch. IV
20	Common Sandpiper	*Actitis hypoleucos* (Linnaeus, 1758)	LC		Sch. IV
21	Oriental Honey Buzzard	*Pernis ptilorhynchus* (Temminck, 1821)	LC		Sch. I
22	Crested Serpent Eagle	*Spilornis cheela* (Latham, 1790)	LC		Sch. I
23	Changeable Hawk Eagle (Crested Hawk Eagle)	*Nisaetus cirrhatus* (Gmelin, JF, 1788)	LC		Sch. I
24	Black Eagle	*Ictinaetus malaiensis* (Temminck, 1822)	LC		Sch. I
25	Shikra	*Accipiter badius* (Gmelin, JF, 1788)	LC		Sch. I
26	Brahminy Kite	*Haliastur indus* (Boddaert, 1783)	LC		Sch. IV
27	Black Kite	*Milvus migrans* (Boddaert, 1783)	LC		Sch. I
28	Common Buzzard (Eurasian Buzzard)	*Buteo buteo* (Linnaeus, 1758)	LC		Sch. I
29	Brown Fish Owl	*Ketupa zeylonensis* (Gmelin, JF, 1788)	LC		Sch. IV
30	Malabar Trogon	*Harpactes fasciatus* (Pennant, 1769)	LC		Sch. IV
31	Common Hoopoe (Eurasian Hoopoe)	*Upupa epops* Linnaeus, 1758	LC		Sch. IV
32	Heart-Spotted Woodpecker	*Hemicircus canente* (Lesson, 1832)	LC		Sch. IV
33	Common Golden-Backed Woodpecker (Common Flameback)	*Dinopium javanense* (Ljungh, 1797)	LC		Sch. IV
34	Lesser Golden-Backed Woodpecker (Black-Rumped Flameback)	*Dinopium benghalense* (Linnaeus, 1758)	LC		Sch. IV

35	Greater Golden-Backed Woodpecker (Greater Flameback)	*Chrysocolaptes lucidus* (Tickell, 1833)	LC		Sch. IV
36	Brown-Capped Pygmy Woodpecker	*Dendrocopos moluccensis* (Vigors, 1832)	LC		Sch. IV
37	White-Cheeked Barbet	*Psilopogon viridis* (Boddaert, 1783)	LC		Sch. IV
38	Malabar Barbet/Crimson Throated Barbet	*Psilopogon malabaricus LC* (Blyth, 1847)	WG		Sch. IV
39	Chestnut-Headed Bee-Eater	*Merops leschenaulti* (Vieillot, 1817)	LC		
40	White-Throated Kingfisher (White-Breasted Kingfisher)	*Halcyon smyrnensis* (Linnaeus, 1758)	LC		Sch. IV
41	Malabar Parakeet (Blue-Winged Parakeet)	*Psittacula columboides* (Vigors, 1830)	LC	WG	Sch. IV
42	Vernal Hanging Parrot	*Loriculus vernalis* (Sparrman, 1787)	LC		Sch. IV
43	Small Minivet	*Pericrocotus cinnamomeus* (Linnaeus, 1766)	LC		Sch. IV
44	Scarlet Minivet (Orange Minivet)	*Pericrocotus flammeus* (Forster, JR, 1781)	LC		Sch. IV
45	Black-Hooded (Headed) Oriole	*Oriolus xanthornus* (Linnaeus, 1758)	LC		Sch. IV
46	Golden Oriole	*Oriolus kundoo* Sykes, 1832	LC		Sch. IV
47	Pied/Bar-Winged Flycatcher-Shrike	*Hemipus picatus* (Sykes, 1832)	LC		Sch. IV
48	Large Woodshrike / Malabar Woodshrike	*Tephrodornis virgatus* (Raffles, 1822)	LC		Sch. IV
49	Common Iora	*Aegithina tiphia* (Linnaeus, 1758)	LC		Sch. IV
50	Black Drongo	*Dicrurus macrocercus* (Vieillot, 1817)	LC		Sch. IV
51	Ashy Drongo	*Dicrurus leucophaeus* (Vieillot, 1817)	LC		Sch. IV
52	Greater Racket-Tailed Drongo	*Dicrurus paradiseus* (Linnaeus, 1766)	LC		Sch. IV

53	White-Browed Fantail	*Rhipidura aureola* (Lesson, 1831)	LC		Sch. IV
54	Long-Tailed Shrike/ Rufous Backed shrike	*Lanius schach* (Linnaeus, 1758)	LC		
55	White-Bellied Treepie	*Dendrocitta leucogastra* (Gould, 1833)	LC	WG	Sch. IV
56	House Crow	*Corvus splendens* (Vieillot, 1817)	LC		Sch. IV
57	Indian Jungle Crow/ Large-Billed Crow	*Corvus macrorhynchosLC* (Wagler, 1827)			Sch. IV
58	Black-Naped Monarch	*Hypothymis azurea* (Boddaert, 1783)	LC		Sch. IV
59	Indian Paradise-Flycatcher (Asian Paradise-Flycatcher)	*Terpsiphone paradisi LC* (Linnaeus, 1758)			Sch. IV
60	Tickell's/ Pale-Billed Flowerpecker	*Dicaeum erythrorhynchos* (Latham, 1790)	LC		Sch. IV
61	Plain Flowerpecker/ Nilgiri Flowerpecker	*Dicaeum concolor* (Jerdon, 1840)	LC		Sch. IV
62	Little Spiderhunter	*Arachnothera longirostra* (Latham, 1790)	LC		Sch. IV
63	Purple-Rumped Sunbird	*Leptocoma zeylonica* (Linnaeus, 1766)	LC		Sch. IV
64	Small /Crimson-Backed Sunbird	*Leptocoma minima* (Sykes, 1832)	LC	WG	Sch. IV
65	Purple Sunbird	*Cinnyris asiaticus* (Latham, 1790)	LC		Sch. IV
66	Loten's Sunbird	*Cinnyris lotenius* (Linnaeus, 1766)	LC		Sch. IV
67	Asian Fairy-Bluebird	*Irena puella* (Latham, 1790)	LC		Sch. IV
68	Golden-Fronted Leafbird	*Chloropsis aurifrons* (Temminck, 1829)	LC		Sch. IV
69	House Sparrow	*Passer domesticus* (Linnaeus, 1758)	LC		Sch. IV
70	Nilgiri Pipit	*Anthus nilghiriensis* (Sharpe, 1885)	VU	WG	Sch. IV

71	Grey Wagtail	*Motacilla cinerea* (Tunstall, 1771)	LC		Sch. IV
72	White-Browed Wagtail/ Large Pied Wagtail	*Motacilla maderaspatensis* (Gmelin, JF, 1789)	LC		Sch. IV
73	White Wagtail	*Motacilla alba* (Linnaeus, 1758)	LC		Sch. IV
74	Common Rosefinch	*Erythrina erythrina* (Pallas, 1770)	LC		Sch. IV
75	Grey-Headed Canary-Flycatcher	*Culicicapa ceylonensis* ceylonensis (Swainson, 1820)	LC		Sch. IV
76	Grey tit/Cinereous Tit / Indian Great Tit	*Parus cinereus* (Vieillot, 1818)	LC		Sch. IV
77	Black-Lored Tit / Indian Black-Lored Tit	*Machlolophus xanthogenys* (Vigors, 1831)	LC		Sch. IV
7 8	Franklin's/ Grey-Breasted Prinia	*Prinia hodgsonii albogularis* (Walden, 1870)	LC		Sch. IV
79	Jungle Prinia	*Prinia sylvatica sylvatica* (Jerdon, 1840)	LC		Sch. IV
80	Ashy Prinia	*Prinia socialis socialis* (Sykes, 1832)	LC		Sch. IV
81	Plain Prinia	*Prinia inornata franklini* (Sykes, 1832)	LC		Sch. IV
82	Booted Warbler	*Iduna caligata* (Lichtenstein, MHK, 1823)	LC		Sch. IV
83	Blyth's Reed Warbler	*Acrocephalus dumetorum* (Blyth, 1849)	LC		Sch. IV
84	Streak-Throated Swallow	*Petrochelidon fluvicola* (Blyth, 1855)	LC		Sch. IV
85	Red-Rumped Swallow	*Cecropis daurica* (Laxmann, 1769)	LC		
86	Pacific Swallow / Hill Swallow	*Hirundo tahitica* (Gmelin, 1789)	LC		
87	Black Bulbul (Square-Tailed Bulbul)	*Hypsipetes leucocephalus* (Gmelin, 1789)	LC		Sch. IV
88	Red-Whiskered Bulbul	*Pycnonotus jocosus* (Linnaeus, 1758)	LC		Sch. IV

89	Red-Vented Bulbul	*Pycnonotus cafer* (Linnaeus, 1766)	LC		Sch. IV
90	Yellow-Browed Bulbul	*Acritillas indica* (Jerdon, 1839)	LC		Sch. IV
91	Tickell's Leaf Warbler	*Phylloscopus affinis* (Tickell, 1833)	LC		Sch. IV
92	Green Leaf Warbler	*Seicercus nitidus* (Blyth, 1843)	NE		Sch. IV
93	Greenish Leaf Warbler	*Seicercus trochiloides* (Sundevall, 1837)	LC		Sch. IV
94	Large-Billed Leaf Warbler	*Seicercus magnirostris* (Blyth, 1843)	LC		Sch. IV
95	Western Crowned Leaf Warbler	*Seicercus occipitalis* (Blyth, 1845)	LC		Sch. IV
96	Oriental White-Eye	*Zosterops palpebrosus* (Temminck, 1824)	LC		Sch. IV
97	Indian Scimitar Babbler	*Pomatorhinus horsfieldii* (Sykes, 1832)	LC		Sch. IV
98	Black Headed/Dark-Fronted Babbler	*Rhopocichla atriceps* (Jerdon, 1839)	LC		Sch. IV
99	Quaker Tit Babbler/ Brown-Cheeked Fulvetta	*Alcippe poioicephala* (Jerdon, 1841)	LC		Sch. IV
100	Rufous Babbler (South of Palghat Gap)	*Argya subrufa hyperythrus* (Sharpe. 1883)	EN		Sch. IV
101	Jungle Babbler	*Turdoides striata* (Dumont, 1823)	LC		Sch. IV
102	Velvet-Fronted Nuthatch	*Sitta frontalis* (Swainson, 1820)	LC		Sch. IV
103	Common Myna	*Acridotheres tristis* (Linnaeus, 1766)	LC		Sch. IV
104	Jungle Myna	*Acridotheres fuscus* (Wagler, 1827)	LC		Sch. IV
105	Indian Robin	*Saxicoloides fulicatus* (Linnaeus, 1766)	LC		Sch. IV
106	Oriental Magpie Robin	*Copsychus saularis* (Linnaeus, 1758)	LC		Sch. IV

107	Asian Brown Flycatcher	*Muscicapa dauurica* (Raffles, 1822)	LC		Sch. IV
108	Brown-Breasted Flycatcher	*Muscicapa muttui* (Layard, EL, 1854)	LC		Sch. V
109	Rusty-Tailed Flycatcher	*Muscicapa ruficauda* (Swainson, 1838)	LC		
110	White-Bellied Blue Flycatcher	*Cyornis pallidipes* (Jerdon, 1840)	LC	WG	
111	Tickell's Blue Flycatcher	*Cyornis tickelliae* (Blyth, 1843)	LC		
112	Verditer Flycatcher	*Eumyias thalassinus* (Swainson, 1838)	LC		
113	Nilgiri Flycatcher	*Eumyias albicaudatus* (Jerdon, 1840)	NT	WG	
114	White-Bellied Sholakili	*Sholicola albiventris* (Blandfords, 1868)	VU		
115	Indian Blue Robin	*Larvivora brunnea* (Hodgson, 1837)	LC		
116	Malabar Whistling Thrush	*Myophonus horsfieldii* (Vigors, 1831)	LC		
117	Black-And-Orange Flycatcher	*Ficedula nigrorufa* (Jerdon, 1839)	NT	WG	
118	Pied Bushchat	*Saxicola caprata* (Linnaeus, 1766)	LC		
119	Scaly Thrush (Nilgiri Thrush)	*Zoothera dauma* (Latham, 1790)	LC		
120	Orange-Headed Thrush	*Geokichla citrina citrina* (Latham, 1790)	LC		
121	Nilgiri Blackbird	*Turdus merula simillimus* (Jerdon, 1839)	NE		
122	Bourdillon's Blackbird	*Turdus merula bourdilloni* (Seebohm, 1881)			

LC: Least Concerned; **NT-** Near Threatened; **VU** -Vulnerable; **EN**-Endangered; **NE**- Not Evaluated; **IUCN**-International Union for Conservation of Nature and Natural resources, **WPA**- Wildlife Protection Act; **END-**Endemic; **Sch.:** Schedule; **WG**- Western Ghats

ANNEXURE 2.8

REPTILES OF ANAMUDI SHOLA NATIONAL PARK

Sl. No.	Scientific Name	Family	Common Name	IUCN	END	WPA
1	*Monilesaurus ellioti* (Günther, 1864)	Agamidae	Elliot's Forest Lizard	LC	WG	
2	*Slea anamallayana* (Beddome, 1878)	Agamidae	Anamalai Spiny Lizard	LC	WG	
3	*Calotes versicolor* (Daudin, 1802)	Agamidae	Indian Garden Lizard	NE		
4	*Dravidogecko anamallensis* (Gunther, 1875)	Gekkonidae	Anamalai Gecko	NT	WG	
5	*Hemidactylus frenatus* (Schlegel, 1836)	Gekkonidae	Asian House Gecko	LC		
6	*Eutropis carinata* (Schneider, 1801)	Scincidae	Common Keeled Skink	LC		
7	*Ristella travancorica* (Beddome, 1870)	Scincidae	Beddome's Cat Skink	LC	WG	
8	*Kaestlea travancorica* (Beddome, 1870)	Scincidae	Travancore Ground Skink	LC	WG	
9	*Ristella sp*	Scincidae	Cat Skink			
10	*Melanophidium punctatum* (Beddome, 1871)	Uropeltidae Shieldtail	Pied-belly	LC	WG	Sch. IV
11	*Uropeltis rubromaculatus* (Beddome, 1867)	Uropeltidae	Red-spotted Shieldtail		WG	Sch. IV
12	*Uropeltis ellioti* (Gray, 1858)	Uropeltidae	Elliot's Shieldtail	LC		Sch. IV
13	*Coelognathus helena* (Daudin, 1803)	Colubridae	Common Trinket Snake	NE		Sch. IV
14	*Ptyas mucosa* (Linnaeus, 1758)	Colubridae	Indian Rat Snake	NE		Sch. II
15	*Lycodon travancoricus* (Beddome ,1870)	Colubridae	Travancore Wolf Snake	LC		Sch. IV
16	*Ahaetulla dispar* (Gunther, 1864)	Colubridae	Gunthr's Vine Snake	NT	WG	Sch. IV
17	*Hebius monticola* (Jerdon, 1852)	Natricidae	Hill Keelback	LC	WG	Sch. IV
18	*Trimeresurus macrolepis* (Beddome, 1862)	Viperidae	Large Scaled Green Pit Viper	NT	WG	Sch. IV

IUCN Status LC –Least Concern; **NE** – Not Evaluated; **NT** – Near Threatened; **END**- Endemism; **IUCN**-International Union for Conservation of Nature and Natural resources; **WPA**-Wildlife Protection Act; **Sch.**- Schedule; **WG**- Western Ghats; **KL**- Kerala.

ANNEXURE 2.9

AMPHIBIANS OF ANAMUDI SHOLA NATIONAL PARK

Sl. No.	Scientific Name	Family	Common Name	IUCN	END	WPA
1	*Duttaphrynus microtympanum* (Boulenger 1882)	Bufonidae	Small-eared Toad	VU	WG	
2	*Minervarya brevipalmata* (Peters, 1871)	Dicroglossidae	Short-webbed Frog	DD	WG	Sch. IV
3	*Micrixalus frigidus* (Biju, Garg, Gururaja, Shouche, & Walujkar, 2014)	Micrixalidae	Cold Stream Torrent Frog	NE	WG	
4	*Uperodon montanus* (Jerdon, 1854)	Microhylidae	Jerdon's Ramanella	NT	WG	
5	*Nyctibatrachus acanthodermis* (Biju, Bocxlaer, Mahony, Dinesh, Radhakrishnan, Zachariah, Giri & Bossuyt 2011)	Nyctibatrachidae	Spinular Night Frog	NE	KL	
6	*Nyctibatrachus anamallaiensis* (Myers, 1942)	Nyctibatrachidae	Anamallai Night Frog	NE	WG	
7	*Nyctibatrachus deccanensis* (Dubois, 1984)	Nyctibatrachidae	Anamallai Night Frog	VU	WG	Sch. IV
8	*Nyctibatrachus poocha* (Biju, Bocxlaer, Mahony, Dinesh, Radhakrishnan, Zachariah, Giri & Bossuyt 2011)	Nyctibatrachidae	Meowing Night Frog	NE	WG	
9	*Indosylvirana sreeni* (Biju, Garg, Mahony, Wijayathilaka, Senevirathne & Meegaskumbura, 2014)	Ranidae	Sreeni's Golden-backed frog	NE	WG	
10	*Walkerana leptodactyla* (Boulenger, 1882)	Ranixalidae	Boulenger's Leaping Frog	EN	WG	Sch. IV
11	*Ghatixalus asterops* (Biju, Roelants & Bossuyt, 2008)	Rhacophoridae	Ghat Tree Frog	DD	WG	

12	*Raorchestes beddomii* (Gunther, 1876)	Rhacophoridae	Beddome's Bush Frog	NT	WG	
13	*Raorchestes chlorosomma* (Biju & Bossuyt, 2009)	Rhacophoridae	Green-eyed Bush Frog	CR	WG	
14	*Raorchestes jayarami* (Biju & Bossuyt, 2009)	Rhacophoridae	Jayaram's Bush Frog	NE	WG	
15	*Raorchestes kadalarensis* (Zachariah, Dinesh, Kunhikrishnan, Das, Raju, Radhakrishnan, Palot & Kalesh, 2011)	Rhacophoridae	Kadalar Bush Frog	NE	KL	
16	*Raorchestes munnarensis* (Biju & Bossuyt, 2009)	Rhacophoridae	Munnar Bush Frog	CR	WG	
17	*Raorchestes sushili* (Biju & Bossuyt, 2009)	Rhacophoridae	Sushil's Bush Frog	CR	WG	
18	*Rhacophorus calcadensis* Ahl, 1927	Rhacophoridae	Kalakad Tree Frog	EN	WG	
19	*Rhacophorus pseudomalabaricus* (Vasudevan & Dutta, 2000)	Rhacophoridae	Malabar False Tree frog	CR	WG	

IUCN Status **CR** – Critically Endangered; **EN**- Endangered; **VU** –Vulnerable; **LC** –Least Concern; **DD** – Data Deficient; **NE** –Not Evaluated; **END** - Endemism; **IUCN**-International Union for Conservation of Nature and Natural resources; **WPA**- Wildlife Protection Act; **WG**- Western Ghats, **KL**- Kerala.

ANNEXURE 2.10

BUTTERFLIES OF ANAMUDI SHOLA NATIONAL PARK

Sl. No.	Subspecies scientific Name	Family	Common Name	IUCN Status/ Endemism	WPA
1	*Troides minos (Cramer, [1779])*	Papilionidae	Sahyadri Birdwing	Endemic to SI	
2	*Pachliopta aristolochiae aristolochiae (Fabricius, 1775)*	Papilionidae	Indian Common Rose		
3	*Graphium teredon (Felder & Felder, 1865)*	Papilionidae	Narrow-banded Bluebottle	Endemic to SI	
4	*Papilio clytia clytia Linnaeus, 1758*	Papilionidae	Oriental Common Mime		Sch. I
5	*Papilio demoleus demoleus Linnaeus, 1758*	Papilionidae	Northern Lime Swallowtail		
6	*Papilio helenus daksha Hampson, 1888*	Papilionidae	Sahyadri Red Helen		
7	*Papilio polymnestor polymnestor Cramer, [1775]*	Papilionidae	Indian Blue Mormon		
8	*Papilio polytes romulus Cramer, [1775]*	Papilionidae	Indian Common Mormon		
9	*Papilio paris tamilana Moore, 1881*	Papilionidae	Sahyadri Paris Peacock		
10	*Catopsilia pomona pomona (Fabricius, 1775)*	Pieridae	Oriental Lemon Emigrant		Sch. IV
11	*Catopsilia pyranthe pyranthe (Linnaeus, 1758)*	Pieridae	Oriental Mottled Emigrant		
12	*Eurema blanda silhetana (Wallace, 1867)*	Pieridae	Sylhet Three-spot Grass Yellow		
13	*Eurema brigitta rubella (Wallace, 1867)*	Pieridae	Small Grass Yellow	LC	
14	*Eurema hecabe hecabe (Linnaeus, 1758)*	Pieridae	Oriental Common Grass Yellow		
15	*Eurema laeta laeta (Boisduval, 1836)*	Pieridae	Indian Spotless Grass Yellow		

16	*Eurema nilgiriensis (Yata, 1990)*	Pieridae	Nilgiri Grass Yellow	Endemic to WG	
17	*Colias nilagiriensis Felder & Felder, 1859*	Pieridae	Nilgiri Clouded Yellow	Endemic to WG	
18	*Delias eucharis (Drury, 1773)*	Pieridae	Indian Jezebel		
19	*Pieris canidia canis Evans, 1912*	Pieridae	Sahyadri Cabbage White		
20	*Cepora nerissa phryne (Fabricius, 1775)*	Pieridae	Dakhan Common Gull		
21	*Belenois aurota aurota (Fabricius, 1793)*	Pieridae	Indian Pioneer		
22	*Appias albina swinhoei (Moore, 1905)*	Pieridae	Sahyadri Common Albatross		
23	*Appias indra shiva (Swinhoe, 1885)*	Pieridae	Sahyadri Plain Puffin		Sch. II
24	*Appias lalage lalage (Doubleday, 1842)*	Pieridae	Himalayan Spot Puffin.		
25	*Appias libythea (Fabricius, 1775)*	Pieridae	Western Striped Albatross		Sch. IV
26	*Appias lyncida latifasciata Moore, 1881*	Pieridae	Sahyadri Chocolate Albatross		Sch. II
27	*Leptosia nina nina (Fabricius, 1793)*	Pieridae	Oriental Psyche		
28	*Elymnias caudata Butler, 1871*	Nymphalidae	Tailed Palmfly	Endemic to SI and SL	
29	*Melanitis leda leda (Linnaeus, 1758)*	Nymphalidae	Oriental Common Evening Brown		
30	*Melanitis zitenius gokala Moore, 1857*	Nymphalidae	Sahyadri Great Evening Brown		Sch. II
31	Lethe drypetis todara *Moore, 1881*	Nymphalidae	Dakhan Treebrown	Endemic to SI and SL	
32	Lethe europa europa *(Fabricius, 1775)*	Nymphalidae	Dakhan Bamboo Treebrown		
33	Lethe rohria neelgheriensis *(Guérin-Méneville, 1843)*	Nymphalidae	Common Treebrown		

34	*Mycalesis anaxias anaxias Hewitson, 1862*	Nymphalidae	Sahyadri White-bar Bushbrown		Sch. II
35	*Mycalesis subdita Moore, 1892*	Nymphalidae	Tamil Bushbrown SI and SL	Endemic to	
36	*Telinga davisoni (Moore, [1891])*	Nymphalidae	Palni Bushbrown	Endemic to WG	
37	*Telinga oculus Marshall, 1881*	Nymphalidae	Red-disc Bushbrown	Endemic to WG	
38	*Ypthima asterope mahratta Moore, 1884*	Nymphalidae	Indian Common Three-ring		
39	*Ypthima baldus baldus (Fabricius, 1775)*	Nymphalidae	Common Five-ring		
40	*Ypthima ceylonica Hewitson, 1865*	Nymphalidae	White Four-ring	Endemic to PI and SL	
41	*Ypthima chenu (Guérin-Méneville, 1843)*	Nymphalidae	Nilgiri Four-ring	Endemic to WG	
42	*Ypthima huebneri Kirby, 1871*	Nymphalidae	Common Four-ring		
43	*Ypthima tabella Marshall & de Niceville, 1883*	Nymphalidae	Sahyadri Baby Five-ring	Endemic to WG	
44	*Ypthima ypthimoides (Moore, 1881)*	Nymphalidae	Palni Four-ring	Endemic to WG	
45	*Rohana parisatis atacinus Fruhstorfer, 1913*	Nymphalidae	Sahyadri Black Prince	LC	
46	*Ariadne merione merione (Cramer, [1777])*	Nymphalidae	Dakhan Common Castor		
47	*Charaxes bharata Felder & Felder, [1867]*	Nymphalidae	Indian Nawab		
48	*Cyrestis thyodamas indica Evans, 1924*	Nymphalidae	Common Map		
49	*Acraea terpsicore (Linnaeus, 1758)*	Nymphalidae	Tawny Coster		
50	*Cethosia mahratta Moore, 1872*	Nymphalidae	Sahyadri Lacewing	Endemic to WG	
51	*Argynnis castetsi castetsi (Oberthür, 1891)*	Nymphalidae	Palni Fritillary	Endemic to WG	

52	*Cirrochroa thais thais (Fabricius, 1787)*	Nymphalidae	Sahyadri Yeoman	Endemic to SI and SL	
53	*Cupha erymanthis maja Fruhstorfer, 1898*	Nymphalidae	Sahyadri Rustic		
54	*Phalanta phalantha phalantha (Drury, [1773])*	Nymphalidae	Oriental Common Leopard		
55	*Libythea laius lepitoides Moore, 1903*	Nymphalidae	Sahyadri Lobed Beak		Sch. II
56	*Libythea myrrha rama Moore, 1872*	Nymphalidae	Sri Lankan Club Beak		
57	*Euthalia lubentina lubentina (Cramer, [1777])*	Nymphalidae	Sahyadri Gaudy Baron		Sch. IV
58	*Athyma inara Westwood, 1850*	Nymphalidae	Color Sergeant		
59	*Athyma perius perius (Linnaeus, 1758)*	Nymphalidae	Oriental Common Sergeant		
60	*Moduza procris procris Fruhstorfer, 1906*	Nymphalidae	Sahyadri Commander		
61	*Neptis hylas varmona Moore, 1872*	Nymphalidae	Indian Common Sailer		
62	*Neptis palnica Eliot, 1969*	Nymphalidae	Creamy / Palni Sailer	Endemic to WG	Sch. II
63	*Pantoporia hordonia hordonia (Stoll, [1790])*	Nymphalidae	Oriental Common Lascar		
64	*Parthenos sylvia virens Moore, 1877*	Nymphalidae	Sahyadri Clipper		Sch. II
65	*Hypolimnas bolina jacintha (Drury, 1773)*	Nymphalidae	Oriental Great Eggfly		
66	*Hypolimnas misippus (Linnaeus, 1764)*	Nymphalidae	Danaid Eggfly		Sch. I,II
67	*Junonia almana almana (Linnaeus, 1758)*	Nymphalidae	Oriental Peacock Pansy	LC	
68	*Junonia hierta hierta (Fabricius, 1798)*	Nymphalidae	Oriental Yellow Pansy	LC	
69	*Junonia iphita iphita (Cramer, [1779])*	Nymphalidae	Chocolate Pansy		

70	*Junonia lemonias lemonias (Linnaeus, 1758)*	Nymphalidae	Chinese Lemon Pansy		
71	*Junonia orithya Butler, 1885*	Nymphalidae	Pale Blue Pansy		
72	*Kaniska canace viridis Evans, 1924*	Nymphalidae	Sahyadri Blue Admiral		
73	*Vanessa indica pholoe (Fruhstorfer, 1912)*	Nymphalidae	Sahyadri Red Admiral		
74	*Vanessa cardui (Linnaeus, 1758)*	Nymphalidae	Painted Lady		
75	*Danaus chrysippus chrysippus (Linnaeus, 1758)*	Nymphalidae	Oriental Plain Tiger		
76	*Danaus genutia genutia (Cramer, [1779])*	Nymphalidae	Oriental Striped Tiger		
77	*Euploea core core (Cramer, [1780])*	Nymphalidae	Indian Common Crow	LC	
78	*Parantica aglea aglea (Stoll, [1782])*	Nymphalidae	Coromandel Glassy Tiger		
79	*Parantica nilgiriensis (Moore, 1877)*	Nymphalidae	Nilgiri Tiger	NT, Endemic to WG	
80	*Tirumala limniace exoticus (Gmelin, 1790)*	Nymphalidae	Oriental Blue Tiger		
81	*Tirumala septentrionis dravidarum Fruhstorfer, 1899*	Nymphalidae	Dakhan Dark Blue Tiger		
82	*Abisara echerius prunosa Moore, 1879*	Riodinidae	Lankan Plum Judy		
83	*Acytolepis puspa felderi Toxopeus, 1927*	Lycaenidae	Malabar Common Hedge Blue		
84	*Castalius rosimon rosimon (Fabricius, 1775)*	Lycaenidae	Continental Common Pierrot		
85	*Catochrysops strabo strabo (Fabricius, 1793)*	Lycaenidae	Oriental Forget-me-not		
86	*Celatoxia albidisca (Moore, [1884])*	Lycaenidae	White-disc Hedge Blue	Endemic to WG	
87	*Celastrina lavendularis lavenduris (Moore, 1877)*	Lycaenidae	Sri Lankan Plain Hedge Blue		

88	*Discolampa ethion ethion Westwood, 1851*	Lycaenidae	Oriental Banded Blue Pierrot		
89	*Freyeria putli (Kollar, [1844])*	Lycaenidae	Oriental Grass Jewel		
90	*Jamides alecto eurysaces (Fruhstorfer, 1916)*	Lycaenidae	Himalayan Metallic Cerulean		
91	*Jamides bochus bochus (Stoll, [1782])*	Lycaenidae	Indian Dark Cerulean		
92	*Jamides celeno celeno (Cramer, [1775])*	Lycaenidae	Oriental Common Cerulean		
93	*Lampides boeticus (Linnaeus, 1767)*	Lycaenidae	Pea Blue		Sch. II
94	*Leptotes plinius plinius (Fabricius, 1793)*	Lycaenidae	Asian Zebra Blue		
95	*Nacaduba beroe gythion Fruhstorfer, 1916*	Lycaenidae	Assam Opaque Six-Lineblue		
96	*Nacaduba kurava canaraica Toxopeus, 1927*	Lycaenidae	Karwar Transparent Six-Lineblue		
97	*Prosotas nora ardates (Moore, [1875])*	Lycaenidae	Indian Common Lineblue		
98	*Talicada nyseus nyseus (Guérin-Méneville, 1843)*	Lycaenidae	Indian Red Pierrot		
99	*Udara akasa mavisa (Fruhstorfer, 1917)*	Lycaenidae	Sahyadri White Hedge Blue		
100	*Zizeeria karsandra (Moore, 1865)*	Lycaenidae	Dark Grass Blue		
101	*Zizina otis indica (Murray, 1874)*	Lycaenidae	Indian Lesser Grass Blue		
102	*Zizula hylax hylax (Fabricius, 1775)*	Lycaenidae	Indian Tiny Grass Blue		
103	*Rapala manea schistacea (Moore, 1879)*	Lycaenidae	Bengal Slate Flash		
104	*Curetis thetis (Drury, [1773])*	Lycaenidae	Indian Sunbeam		
105	*Choaspes benjaminii benjaminii (Guérin-Méneville, 1843) Sahyadri Indian Awlking*	*Hesperiidae*	Sahyadri Indian Awlking		

106	*Hasora taminatus taminatus (Hübner, 1818)*	Hesperiidae	Lankan White-banded Awl		
107	*Celaenorrhinus fusca (Hampson, 1888)*	Hesperiidae	Dusky Spotted Flat		
108	*Celaenorrhinus leucocera (Kollar, [1844])*	Hesperiidae	Common Spotted Flat		
109	*Pseudocoladenia dan dan (Fabricius, 1787)*	Hesperiidae	Sahyadri Fulvous Pied Flat		
110	*Coladenia indrani indra Evans, 1926*	Hesperiidae	Dakhan Tricolor Pied Flat		
111	*Spialia galba (Fabricius, 1793)*	Hesperiidae	Indian Grizzled Skipper		
112	*Aeromachus dubius dubius Elwes & Edwards, 1897 Sahyadri Dingy Scrub Hopper*	Hesperiidae	Sahyadri Dingy Scrub Hopper		
113	*Aeromachus pygmaeus (Fabricius, 1775)*	Hesperiidae	Pygmy Scrub Hopper		
114	*Gangara thyrsis thyrsis (Fabricius, 1775)*	Hesperiidae	Oriental Giant Redeye		
115	*Notocrypta curvifascia curvifascia (Felder & Felder, 1862) Chinese Restricted Demon*	Hesperiidae	Chinese Restricted Demon		
116	*Thoressa sitala (de Nicéville, 1885)*	Hesperiidae	Nilgiri Plain Ace	Endemic to WG	
117	*Udaspes folus (Cramer, [1775])*	Hesperiidae	Grass Demon		
118	*Potanthus palnia palnia (Evans, 1914)*	Hesperiidae	Palni Dar		
119	*Potanthus pava pava (Fruhstorfer, 1911)*	Hesperiidae	Yellow Dart		
120	*Telicota bambusae bambusae (Moore, 1878)*	Hesperiidae	Oriental Dark Palm-Dart		
121	*Telicota colon colon (Fabricius, 1775)*	Hesperiidae	Indian Pale Palm-Dart		
122	*Caltoris kumara kumara (Moore, 1878)*	Hesperiidae	Sahyadri Blank Swift		

123	*Pelopidas agna agna (Moore, [1866])*	Hesperiidae	Bengal Obscure Branded Swift		
124	*Pelopidas subochracea subochracea (Moore, 1878)*	Hesperiidae	Bengal Large Branded Swift	Sch. IV	

NT- Near Threatened; **LC**- Least Concern; **WG**- Western Ghats; **SI**- South India; **PI**- Peninsular India; **SL**- Sri Lanka; **IUCN**-International Union for Conservation of Nature and Natural resources; **Sch.**- Schedule

ANNEXURE 2.11

ODONATES OF ANAMUDI SHOLA NATIONAL PARK

Sl. No	Scientific names	Family	English Names	Endemicity	IUCN
1	*Aciagrion approximans krishna* Fraser, 1921	Coenagrionidae	Violet-Striped Slender Dartlet		LC
2	*Anax immaculifrons* Rambur, 1842	Aeshnidae	Blue Darner		LC
3	*Caconeura ramburi* (Fraser,1922)	Platycnemididae	Coorg Bambootail	WG	DD
4	*Diplacodes trivialis* (Rambur,1842)	Libellulidae	Ground Skimmer		LC
5	*Orthetrum chrysis* (Selys, 1891)	Libellulidae	Brown-Backed Red Marsh Hawk		LC
6	*Orthetrum glaucum* (Brauer, 1865)	Libellulidae	Blue Marsh Hawk		LC
7	*Orthetrum pruinosum* (Burmeister,1839)	Libellulidae	Crimson-Tailed Marsh Hawk		LC
8	*Orthetrum triangulare* (Selys, 1878)	Libellulidae	Blue-Tailed Forest Hawk		LC
9	*Pantala flavescens* (Fabricius, 1798)	Libellulidae	Wandering Glider		LC
10	*Trithemis aurora* (Burmeister, 1839)	Libellulidae	Crimson Marsh Glider		LC
11	*Indolestes gracilis* (Hagen, 1862)	Lestidae	Davenport's False Spreadwing	WG	LC
12	*Copera marginipes* (Rambur, 1842)	Platycnemididae	Yellow Bush Dart		LC
13	*Crocothemis servilia* (Drury, 1770)	Libellulidae	Ruddy Marsh Skimmer		LC
14	*Neurobasis chinensis* (Linnaeus, 1758)	Calopterygidae	Stream Glory		LC
15	*Trithemis festiva* (Rambur, 1842)	Libellulidae	Black Stream Glider		LC
16	*Ischnura rubilio Selys,* 1876	Coenagrionidae	Golden Dartlet		LC
17	*Esme mudiensis Fraser*, 1931	Platycnemididae	Travancore Bambootail	WG	DD
18	*Neurothemis fulvia* (Drury, 1773)	Libellulidae	Fulvous Forest Skimmer		LC
19	*Vestalis gracilis* (Rambur, 1842)	Calopterygidae	Clear-Winged Forest Glory		LC

LC-Least Concern; DD-Data deficient; IUCN-International Union for Conservation of Nature and Natural resources; WG-Western Ghats

ANNEXURE 2.12

ANTS OF ANAMUDI SHOLA NATIONAL PARK

SL. No.	Species Name	Sub Family
1	Camponotus sp.	Formicinae
2	*Myrmoteras brachygnathum Moffett, 1985*	Formicinae
3	Pheidole sp.	Myrmicinae
4	*Technomyrmex albipes (Smith, F., 1861)*	Dolichoderinae
5	Plagiolepis sp.	Formicinae
6	Tetramorium sp1.	Myrmicinae
7	Tetramorium sp2.	Myrmicinae
8	Lordomyrma sp.	Myrmicinae

ANNEXURE 3.1

Government of India, Ministry of Environment and Forest vide letter No. F(c) A/11.6/172/Misc/KER dt. 02-05-2005

To

No. F(C)A/11.6/172/MISC/KER
The Principal Secretary to Dated: 02.05.2005 Government of Kerala
Forest & Wildlife Department Secretariat Thiruvananthapuram.

Sub: Approval for the Management Plan for the Captive Plantation of M/s. Hindustan Newsprint Limited for the period from 2005-06 to 2009-10 – reg.

Ref: 1) State Govt.'s Letter No. 2893/B1/2005/F&WLD dated 14.03.2005

2) This office letter of even no. dated 20.04.2005

3) CCF(Planning), Kerala Letter No. Plg1-163/2005 dated 28.04.2005

Sir,

Kindly refer to the subject and references cited above. I am directed to inform you that the draft Management Plan for captive plantations of Hindustan Newsprint Limited for the period 2005-06 to 2009-10 furnished by State Government has been examined by this office and the State Govt. was requested by this office that a reconciliation of the area may be done and the statement indicating the actual extent and location of the leased area, status of land leased to M/s. Hindustan Newsprint Limited may be furnished to this office. The CCF(P) vide letter at Sl.No. 3 above has furnished a statement showing reconciliation of area. The statement furnished by Chief Conservator of Forests (P) above has been examined by this office and found to be adequate.

The Management Plan has been examined along with the area reconciliation details furnished by Chief Conservator of Forests (P), with reference to the provisions of the F(C) Act, 1980 and National Forest Policy, 1988. After careful consideration, I am directed to convey in-principle approval of Central Government to the Management Plan of M/s. Hindustan Newsprint Limited for the period 2005-06 to 2009-10 subject to the following conditions:

i) The modified copy of the Management Plan incorporating the reconciliation of area figures as furnished by Chief Conservator of Forests (Planning) vide letter as Sl. No. 3 above, shall be furnished to this office within a period of one month. The actual implementation of the prescriptions of Management Plan shall be undertaken only after the modified plan is forwarded to this office.

ii) No clear felling should be carried out in hilly areas having slope more than 30 degrees.

iii) The controlled burning of debris in plantations felled for regeneration will not be undertaken.

iv) Fodder/fruit trees which attract birds and animals should be retained and nurtured.

v) The felling of trees in areas having slope more than 30 degree and along the bank of river/ streams shall not be undertaken.

vi) The felling of standing trees other than eucalyptus shall not be undertaken in pursuance of the directions of the Hon'ble High Court of Kerala vide order dated 05.03.1998 in W.P. No.314/1995.

vii) No permanent building, road, bridges etc. should be constructed on the forest land. However, temporary operational facilities like nurseries, protection sheds, kutcha approach roads for plantation/extraction path can be prepared as per the standard practices without resorting to felling of trees. The temporary structures when not needed may be removed / demolished and the area should be reverted to its normal condition.

viii) It may be ensured that non non-forestry activity is permitted/allowed in forest area in violation of the provisions of Forest (Conservation) Act, 1980.

ix) The plantation areas harvested in a year shall be regenerated next year as per the prescriptions. However, if there is a shortfall in area regenerated in a year vis-à-vis the area harvested in previous year then report to that effect shall be made to this office and further clearance of plantation shall not be undertaken unless specifically permitted by this office. The detailed report indicating area harvested in a year and area to be regenerated shall be sent to this office by 30th June of each year.t

x) The maintenance of forest boundary and firelines shall be taken up each year in accordance with the established practice and annual expenditure incurred thereon shall be reported to this office by 30th June of each year.

I am further directed to inform you that prior approval of Central Govt. shall be obtained if any deviation is to be made from the prescriptions of approved Management Plan. It may also be ensured that provisions of Forest (Conservation) Act, 1980 and guidelines issued there under are strictly followed while implementing the Management Plan prescriptions. The Central Govt. reserves the right to review, modify or withdraw this approval if any of the conditions of approval are not implemented or amendment to plan is necessitated keeping in view the provisions of Forest (Conservation) Act, 1980, guidelines issued there under or general instructions issued by Central Govt. for the scientific management of forests. This Management Plan will be due for revision in the year 2010-2011 and timely steps may please be initiated for revision of Management Plan.

Yours faithfully –

sd-

(K.S.P.V. Pavan Kumar)
Deputy Conservator of Forests (C)

Copy to:

1) The Director General of Forests & Special Secretary to Govt. of India, Ministry of Env. & Forests, Paryavaran Bhavan, CGO Complex, New Delhi – 3.

2) The Principal Chief Conservator of Forests, Forest Department, Govt. of Kerala, Forest Head Quarters, Vazhuthacaud, Thiruvananthapuram.

3) The Managing Director, Hindustan Newsprint Limited, Newsprint Nagar, Kottayam, Kerala.

(K.S.P.V. Pavan Kumar), Deputy Conservator of Forests (C)

Annexure 3.2

Government of Kerala GO (Ms) No 42/93/F&WLD dt. 11-06-93

GOVERNMENT OF KERALA

Abstract

Forest Department – Production of eucalyptus for industrial Use-Making forest area available to M/s. Hindustan Newsprint Ltd. For captive Plantation – Orders issued. Forest & Wildlife © Department.

G.O. (Ms) No. 42/93/F&WLD Dated, Thiruvananthapuram, 11-6-1993.

Read: - Letter No. G3-21796/89 dated 5/11/1992 from the Chief Conservator of Forests.

ORDER

There are a few major Wood-based industrial units in Kerala, which have been receiving substantial supplies of eucalyptus wood from the existing eucalyptus plantations of the Forest Department of the State. It has however been found from experiences that the annual eucalyptus crops harvested from the plantations of the Forest Department are not adequate to meet the actual requirements of the industries. The question as to how this problem of short supply of raw-material can be solved has been engaging the attention of the government for some time.

It has been suggested that the above problem can be solved to a considerable extent if the industrial units which utilize the eucalyptus as raw-material are themselves permitted to cultivate it on their own in the most scientific and efficient manner with the objective of achieving maximum productivity, to freely harvest their own product and to use it for their own purpose.

M/s. Hindustan Newsprint Limited, Vellur, Kottayam district is a public sector industrial unit belonging to the Government of India which is utilising about 1.5 lakhs tonnes of eucalyptus annually as raw-material for producing newsprint. They have come forward with a proposal to cultivate eucalyptus on their own in the forest land of Kerala for being used as raw-material in their factory. The Chief Conservator of Forests has also recommended this proposal.

After having examined the matter in all its aspects, the Government are [leased to order as follows:

(i) An area of 5600 ha of existing plantation of eucalyptus Grandis belonging to the Forest Department will be made available to M/s. Hindustan Newsprint Ltd., Vellur, for the present for the purpose of their own captive plantation to meet the raw-material requirement of their existing plant.

(ii) If M/s. Hindustan Newsprint Ltd. Vellur take over Punalur Paper Mill, which is now closest, and make it operational, the following additional areas will also be made available to them in future for captive plantation.

(iii) An area of 4400 ha of existing eucalyptus plantation of the Forest Department for the raw-material requirement of the major expansion project of Ms/ H.N.L. which is now under active consideration.

b. An area of 1000 ha of existing eucalyptus plantation of the Forest Department for the raw-material requirement of Punalur Paper Mill.

(iii) The Forest area (ie. Existing eucalyptus plantation) which is made available to M/s. HNL for captive plantation as mentioned above will continue to be Reserve Forest belonging to the State; its control protection and administration will remain with the State's Forest Department; and the role of M/s. HNL will be confined to the cultivation and harvesting of the eucalyptus crop subject to the guidance and supervision of the Chief Conservator of Forests.

(iv) The price of the existing eucalyptus trees standing in the area, which is allotted to them, will be collected from M/s. HNL at the time of making the area available to the Company-for which the Chief Conservator of Forests will (in consultation with the Chief Executive of M/s. HNL) estimate the value of the standing trees and get it approved by the Government.

(v) As and when the eucalyptus planted by M/s. HNL is harvested in future, they will pay a royalty of Rs. 150/- (rupees. One hundred and fifty only) to the Forest Department of the State for every metric tonne of eucalyptus wood at 50% moisture content.

(vi) The above arrangement will be valid for a period of twelve years from 1993-94 to 2005-2006 and will be reviewed thereafter.

(vii) The Chief Conservator of Forests will take immediate action to take immediate action to identify the area of 5600 ha of existing eucalyptus Grandis Plantation to be made available to m/s. HNL and make the area available to the Company for cultivation as early as possible.

(By Order of theGovernor) –

sd-

R. RAMACHANDRAN NAIER,
Commissioner & Secretary to Govt.

To

The Chief Conservator of Forests (Protection) The Chief Conservator of Forests (Development)

The Executive Director, HNL NewsPrint Nagar, Vellur, Kottayam district. The Executive Director, HNL, Newsprint Nagar, Vellur, Kottayam district. The Accountant General (this issues with the concurrence of the Finance Department)

The Finance Department (Vide No. 2219/AWAI/93/Find) The Industries © Department.

Copy to the Forest (B) Dept. For further necessary action. Copy to the Forest (D) Dept. For further necessary action.

Forwarded/By Order

ANNEXURE 3.3

GOVT. OF KERALA AGREEMENT WITH HNL 04-10-2007

THIS AGREEMENT is executed on this the 4th day of OCTOBER Two Thousand Seven BETWEEN the Governor of Kerala (hereinafter referred to as the Government" which expression shall, where the context so admits, include his successors in office and assigns) of the ONE PART and the Hindustan Newsprint Limited, registered under Indian Companies Act, 1956 and having its Registered office at Newsprint Nagar, Velloor, Vaikom Taluk, Kottayam District; Kerala (hereinafter referred to as "Company" which expression shall, where the context so admits, include its successors and assigns) of the

OTHER PART:

WHEREAS an agreement was entered into on the 7th day of October, 1974 between the parties hereto (hereinafter called "the Principal Agreement") under which the company was permitted to establish a pulp/newsprint/paper mill and other allied Plants in Kottayam District of Kerala State, for the manufacture of pulp, newsprint, paper and other allied products of paper/boards and allied products of different qualities "(hereinafter referred to as "the products") from eucalyptus grandis , Eucalyptus tereticornis and other pulp woods, reeds and other cellulosic material grown in the forests of Kerala) all of which are hereinafter collectively called "the raw materials");

AND WHEREAS as per Clause 8 of the Principal Agreement it shall be in force for a period of 30 years starting from 07.10.1974 subject to renewal of further terms and conditions to be negotiated between the parties.

AND WHEREAS, Government of Kerala has issued necessary order for renewing the long term agreement for a further period of twenty years on expiry of the Principal Agreement on Octover6, 2004, as per GO(MS) NO. 20/2006/ID dated, Thiruvananthapuram, 21.02.2006;

AND WHEREAS, based on the Government Order referred above, Company has executed the Agreement with Government of Kerala on the 8th day of May Two Thousand Six for a period of 20 years starting from October 7, 2004, subject to renewal for further term on conditions to be mutually agreed between the parties;

AND WHEREAS, the Government of Kerala as per Clause 4(1) of the Principal Agreement has undertaken to make available annually to the Company 150000 tonnes (One Lakh and Fifty Thousand Tonnes) of eucalyptus wood at 50% moisture content consisting of not less than 100000 (One Lakh) tones of eucalyptus grandis variety at 50% moisture content from the State Plantations of eucalyptus grandis and eucalyptus tereticornis including the yield from the plantations reserved viz Pamba, Kottayam. Punalur, Thenmala and Thiruvananthapuram Forest Divisions, for the purpose and not permit harvesting eucalyptus grandis therefrom by any party other than the Company;

AND WHEREAS, the Government as per Clause 4(i) of the renewed long term agreement, has undertaken to make available annually to the Company, 50000 MT of eucalyptus wood (grandis and hybrid) and 100000 MT of Acacia, Mangium and other

pulpwood species at 50% M.C. from the State Forest Department's plantations, 75000 MT of reeds

at 50% moisture content and 75000 MT of bamboo in net weight from the forest as near to the mill as possible;

AND WHEREAS, the Company as per Clause 5 of the Principal Agreement agreed to pay to the Government of Kerala royalty for the raw materials supplied to the Company @Rs.11/- (Rupees Eleven) per tonne of green wood of eucalyptus grandis and eucalyptus Tereticornis (Both with 50% moisture) provided that the Government may at the end of every 5 years from the commencement of manufacture of products revise these rates in consultation with the Company and the Company shall be bound to pay at the rate so revised by the Government from time to time;

AND WHEREAS, the Company commenced commercial exploitation of eucalyptus grandis from the reserved areas from 1982 and continues every year thereafter.

AND WHEREAS, the Government has revised the rates at the rate of Rs.335/-(Rupees Three Hundred and Thirty Five) per MT of green wood of eucalyptus grandis and eucalyptus Tereticornis with effect from 01.10.1991, subject to revision as and when found necessary by Government;

AND WHEREAS, it has become necessary for the Company to get assured regarding the sustained supply of eucalyptus grandis for production of Newsprint un interruptedly as per existing capacity, both the parties have agreed to go for Captive Plantations at the Company's cost in the Forest lands permitted by the Government;

AND WHEREAS, the Government vide Order No. G.O. (MS) 42/93/F&WLD dated 11.06.1993 (hereinafter referred to as 'said order', which shall from part of this agreement as if incorporated herein) were pleased to order an area of 5600 ha of existing plantation of eucalyptus belonging to the Forest Department to be made available to Hindustan Newsprint Limited, for the purpose of raising Captive Plantations at the company's cost for producing the raw materials requirement of their existing plant subject to the terms and conditions contained therein and hereinafter mentioned;

AND WHEREAS, the Chief Conservator of Forests has been instructed to take action to identify an area of 5600 ha of existing eucalyptus grandis plantations to be made available to Hindustan Newsprint Limited, and issue orders permitting cultivation of the area with pulpwood crop;

AND WHEREAS, as per Clause 4(v) of the renewed long term agreement for a period of 20 years, the Government of Kerala agreed to supply forest raw materials to the Company at such prices as may be recommended from time to time by the expert Committee constituted under section 4 of the Kerala Forest Product (Fixation of Selling Price) Act, 1978 provided that the price will be fixed after consultation with the Company;

AND WHEREAS, the Captive Plantation Agreement entered into between the Company and the Government of Kerala on the 26th day of April, 2000 for a period of 12 years from 1993-94 to 2005-06 expired in 2006;

AND WHEREAS, the Government of Kerala as per Clause 4(iv) of the renewed long term agreement for a period of 20 years, agreed to renew the existing Captive Plantation Agreement entered into between the Company and the Government of Kerala on its expiry in 2006 for a further period of 14 years or till such period as the Company continues as a Central Public Sector Undertaking, whichever is earlier;

AND WHEREAS, the parties hereto have therefore agreed to enter into the agreement (hereinafter referred to as second supplemental agreement) on terms and conditions herein contained.

NOW THESE PRESENTS WITNESS AND IT IS HERE BY MUTUALLY AGREED AS FOLLOWS

1. The Company hereby agrees that the land permitted for raising Pulpwood Plantations will not be utilized for any purpose other than permitted and the Company will have no claim from Government for the expense incurred for plantation activities undertaken.

2. The establishment of the Kerala Forest Department in the areas proposed for raising plantation will be continued for all works other than works taken up by the Company for raising the plantations.

3. The forest areas permitted for raising Captive Pulpwood Plantations will continue to be Reserve Forest belonging to the State, and its control, protection and administration will remain with the State Forest Department, and the role of the Company will be confined to the cultivation, maintenance and harvesting of the pulpwood crop subject to the guidance and supervision of the Chief Conservator of Forests governed by the terms and conditions hereinafter mentioned.

4. The Government will continue to have the ownership of the land where Captive plantations are raised by the company without any change in legal status. The Government agree that the produce available from the Captive Plantation will be permitted to be extracted only by the Company against the agreed quantity and it will not be allotted to any other party without the prior consent of the Company.

5 (a) The Company agrees that the area where Captive Plantation is found to be a failure shall be resumed to the Department and proportionate rent for such area till it is resumed shall be paid to the Government.

(b) The Company agrees to pay lease rent fixed by Government from time to time for areas, for which permission was given for raising plantations irrespective of whether the area is planted or not by the Company, except in the cases where the reasons for not raising the plantation are beyond the control of the Company.

6. The period of agreement shall be for 14 years from 01.04.2006 or till such period as the Company continues as a Central Public Sector Undertaking whichever is earlier. The agreement can be renewed thereafter by mutual consent with appropriate changes.

7 (a) When cutting, converting and stacking of pulpable wood are completed n a strip, the Company shall furnish a list in duplicate to the Range Officer / Deputy Range Officer concerned showing the details of pulpable wood stacks. The same shall be verified by the Range Officer / Deputy Range Officer concerned and necessary passes for the removal shall be issued by the Range Officer / Deputy Ranger Officer concerned. The extension of period of passes shall also be allowed by the Range Officer / Deputy Range Officer concerned; For piece-meal transport of raw materials covered by the departmental passes, subsidiary pass books in Form No. IV of Kerala Forest Produce Transit Rules 1975 can be had on application from the Deputy Conservator of Forests / Assistant Conservator of Forests concerned on payment of value and tax thereof. No subsidiary pass shall be issued for produce not covered by current departmental passes.

A subsidiary pass for each lorry load shall be issued taking care that all columns therein are duly filled up by the nominee of the Company approved by the Deputy Conservator of Forests / Assistant Conservator of Forests concerned. The counterfoils of the used up passes together with all unused shall be returned to the Deputy Conservator of Forests / Assistant Conservator of Forests within thirty days from the date of expiry of the working season.

(b) The pulpwood on arrival at the premises of the Company at Velloor shall be weighed in the presence of the Forest officers stationed at the Mill Site and the Company shall maintain records thereof and copy of such records shall be sent to the concerned DFOs.

(c) The Company agrees that the Pulpwood extracted from the Captive Plantations shall not be sold or utilized for any purpose other than as raw material for their own use within the State except with specific permission of the Government.

(d) The Company agrees that no burning other than that required Silviculturally, be done in the areas and that all natural tree growth and animals available in

the area shall be retained as such.

8. The Government agree to permit the Company for insuring the entire plantations raised and maintained by them against untoward happenings like fire, theft etc. and further agree that the company can receive the insurance claim, if any, in full from the insurance Company for the claims put forth by the Company without any liability to the Government;

9. The Company shall pay the lease rent for every hectare of area permitted to raise Captive Plantations.

10. Both the Government and the Company shall be responsible for the protection of the and against encroachment. The actual areas for Captive Plantations will be verified by a Joint Inspection by officers of the Government and of the Company and surveyed and demarcated.

11. The Company shall abide by Section 29 of Kerala Forest Act with reference to fire protection (for fire incidents and damages if any, that occur within the Captive Plantations, Company only shall be liable and responsible).

12. Company shall furnish a lost of Company's staff, agents and Workmen to the concerned DFO and get his approval. The Government agree that the Company can engage these approved agents, staff and workmen for the purpose of the work and utilize the existing roads, water source or any other natural resources available within the area permitted for the purpose of the plantation, free of charge. The Government also agree that the Company can improve existing roads and other facilities for extraction of the crop and also construct semi-permanent structures if required for facilitating effective supervision without damaging and detrimenting the natural growth, for the purpose of the cultivation and harvest of the pulpwood with the prior permission of the concerned DFO in writing. Any or all structures constructed in the work area shall be demolished / handed over to the Government at the expiry of the Agreement period.

13. The Government agree that the Company can resort to mechanization activities required for raising and harvesting the captive plantation, without damaging natural tree growth.

14 (a) The Company shall be responsible for the safety of forest wealth in the area permitted for raising captive plantation. If any forest tree is lost, rendered useless or otherwise destroyed during the agreement period, the Company shall be liable to pay the value of such wealth as assessed by the concerned Divisional Forest Officer at the scheduled rate, or the rate for standing timber notified from time to time by the Government under Section 3 of the Kerala Forest Product (Fixation of Selling Price) Act. 1978 whichever is higher.

(b) Company shall ensure for the protection and conservation of biodiversity of the area adjoining to the captive plantation.

(c) The Company agrees that violation of this agreement shall forfeit the right of the Company for raising the captive plantation in the area and the Government is at liberty to withdraw the permission given to the Company for

raising the plantations in such areas and that such areas shall be taken by the Government with all improvements made, without paying any compensation to the Company in respect thereof.

15. The existing check post if any in the area will continue to function under the control of the Forest Department.

16. In the case of any penalty imposed by Divisional Forest Officer for the infringement of Acts and Rules in force due to omissions and commissions by the Company, the staff, agents or workmen engaged by the company, the Company is at liberty to refer the matter to Conservator of forests whose decision therein shall be final.

17. The Government agree that the employees with valid identity cards of the Company and approved by the concerned DFO's and vehicles owned and used by the company will be permitted to enter the plantation areas.

The Company shall engage only the approved Agents, staff and workmen in the plantation and shall provide identify cards to all the persons showing the name, age and address. They shall produce the identity cars on demand by any forest officer. The Company will be held responsible for all acts and omissions of such agents, staff or workers causing damage to the areas. The Divisional Forest Officer is at liberty to direct the Company to withdraw any of their agents or workers and the Company shall abide by such directions. Any produce collected by persons who are not authorized shall be liable for confiscation and appropriation by the Divisional Forest Officer in such manner as he deems fit and such persons shall be dealt with under the relevant Acts and Rules in force. Duly accredited representative of the Company shall be present in the area during the period of agreement.

18. The Government agree that the yield obtained at the time of every harvest from the captive plantation shall be accounted against the committed quantity of pulpwood to be supplied by government against that year.

19. All the Shola Forests in the area within or adjoining (within 2 chain belt around) the area allotted to the Company shall be protected by the Company.

(a) Government reserves its right to take any part of the area for puclic purpose, without paying compensation.

20. The Company shall at all times comply with the provisions of the Kerala Forest Act and the Rules framed there under and such other laws and rules and regulations as are applicable from time to time.

21. The Company shall be liable and responsible for payments, if any, to the agents, staff and workers engaged/employed by the Company including all claims as per the Workmen Compensation Act and such claims/payments shall be settled by the Company. All payments due to Government from the company by virtue of the agreement, if not paid within the time allowed, shall be recovered from the company and their properties movable and immovable under the provisions of the Revenue Recovery Act for the time being in force as if they were arrears of land revenue and in such other manner as the Government may deem fit.

22. On expiry of the agreement period the Company shall vacate the areas after preparing a joint mahazar with the concerned Range Officers indicating liabilities, if any, on part of the company. A copy of the joint mahazar shall be furnished to the Company.

23. The Government agree that the barks, lops and tops obtainable from the captive plantations during extraction of the plantation shall be the property of the Company and the Company is free to use or dispose if of at their option.

24. The external boundaries of the Captive Plantations will be demarcated by granite Stones/ concrete blocks marked CP/HNL.

25. The value of pulpwood crop raised by Forest Department available in the area permitted for raising captive plantations shall be paid by the Company to the Government as per valuation approved by the Government.

26. No standing trees (except eucalyptus trees and plants) shall be cut and removed by the Company without the permission for the Hon'ble High Court from the areas ear-marked for Captive Plantation by the Company as directed by the Hon'ble High Court in writ appeal No.314/95 filed by Kerala Forest

Protective Staff Association represented by its Kottayam District Committee President.

Any dispute, doubt, difference or ambiguity which may at any time arise between the parties hereto, touching on or arising out of or in respect of this Agreement or the subject matters hereof, shall be referred to a committee consisting of the Principal Secretary/Secretary (F&WL), the Principal Chief Conservator of Forests (General) and the Managing Director, HNL and their decision shall be final and binding on the parties.

IN WITNESS WHEREOF

SHRI C.S. Yalakki, CCF (Pot) for and on behalf of the Governor of Kerala and Sri. N. P. Prabhu M D. for and on behalf of Hindustan Newsprint Limited have hereunto been affixed on the day, month and year first above written.

THE SCHEDULE OF PROTERTY ABOVE REFERRED TO signed by Shri. C.S. Yalakki, CCF (Prot) for on behalf of this Governor of Kerala

Sd/-
C.S. YALAKKI, IFS
Chief Conservator of Forests

In the presence of Witness: (Protection)Forest Headquarters

Thiruvananthapuram.

1. S. SreeRekha, U.D. Clerk, O/o. CCF (P) sd/-
2. Suji Stantly, U.D. Clerk, O/o. CCF (P) sd/-

Signed by Shri. N.P. PRABHU MD for on behalf of Hindustan Newsprint Limited

Sd/-
N.P. PRABHU
Managing Director

In the presence of witnesses;

HINDUSTAN NEWSPRINT LTD.,
NEWSPRINT NAGAR – P.O.,
KOTTAYAM DIST, KERALA – 686 610

1. P. Govindankutty Sd/-
   Manager (Forestry & Liaison)
   HNL, Trivandrum
2. M.K. Sasindran Nair Sd/-
   Senior Inspector GOI,
   HNL, Thiruvananthapuram.

ANNEXURE 3.4

THE DETAILS OF FIRE INCIDENTS OVER THE LAST TEN YEARS IN ANAMUDI SHOLA NATIONAL PARK

SI No.	Year	Location	Extent	GPS	
				Latitude	Longitude
1	2011	Pazhathottam	3 ha	10.18712	77.23625
2	2016	Melavalsapetty kudi	2 ha	10.237222	77.238222
3	2016	Anivara	3 ha	10.2195	77.2133056
4	2016	Pazhathottam	5 ha	10.188972	77.240583
5	2018	Irikkamedu	2 ha	10.211416	77.208611
6	2018	Anivara	1 ha	10.2172305	77.2123111
7	2019	Pazhathottam	25 ha	10.187475	77.237522
8	2019	Jandamala	70 ha	10.1824722	77.21975

ANNEXURE 3.5

LIST OF RESEARCH PROGRAMS CONDUCTED IN ANAMUDI SHOLA NATIONAL PARK

Sl. No.	Title of project	Principal Investigator	Duration	Institution
1	Ecology and Conservation of fresh water Swamp ecosystem of the Western Ghats, Kerala Region.	DR. Rajendra Prasad	2016-2018	TBGRI, Palode
2	Antivirals from medicinal plants of Western Ghats selected based on the traditional Knowledge (TK) or ethnobotanical information	DR. S.R. Suja	2015-2018	TBGRI, Palode
3	Bio-processing of two coded anti-diabetic medicinal plants based on ethnobotanical leads with special reference to diabetic complications- A molecular pharmacology approach.	DR. S.R. Suja	2015-2018	TBGRI, Palode
4	Understanding the evolution of endemism in the Amphibians of the Western Ghats.	DR. P.S. Easa	2016-2018	Asia Biodiversity conservation Trust, Thrissur
5	Assessment of Eco-tourism Sustainable Practice in Munnar, Kerala: Multifactorial analysis of the destination.	Prof. Prodyut Bhatacharya	2017-2019	University School of Environment Guru Govind Singh Indraprastha University, New Delhi Management,
6	Diversity, conservation and sustainable utilisation of fungi of Western Ghats	Dr. D.H. Biju	2013-2017	TBGRI, Palode
7	Spatio-temporal patterns in Human-wildlife conflict in Kerala	Dr. P.O. Nameer	2016-2019	College of Forestry, KAU, Thrissur
8	Diversity and distribution of polypores in forest ecosystem of Kerala	Dr. K. Vidyasagaran	2016-2019	College of forestry, KAU, Thrissur.
9	Pollination Biology of selected taxa of the tribe Commelineae (Commelinaceae)	Prof. Santhosh Nampy	2016-2019	University of Calicut
10	Biodiversity studies in Curculionoidea	B. Ramesha	2016-2019	College of Agriculture, Kasargode

11	Molecular systematics of the *Didymocarpus henckelia* genetic complex (Gesneriaceae) in India	Dr. K. Narayanan Nair	2016-2018	National Botanical Research Institute, Lucknow
12	BTGS-Plant growt promoting and biocontrol microbes for high quality bamboo planting stock production (R&D) project	Dr. G E. Mallikarjuna Swamy	2016-2018	KFRI, Thrissur
13	Revision of the genus *Grewia* L. (Malvaceae- Grewioideae) from India	DR. Mayur D. Nandikar	2016-2019	Naorpji GodreJ Centre for Plant Research, Maharashtra
14	Identification and mapping Montane Shola Grassland for conservation action	Dr. Robin Vijayan	March-December 2017	IISER, Tirupathi
15	Spiders (Arachnida: Araneae) in the cloud forests of the sky islands in Western Ghats: taxonomical and ecobiogeographical approach	Dr. Mathew M.J	2015-2017	Sacred Heart college, Thevara, Cochin
16	Syatematic studies on Bryophytes of Anamudi Shola National Park in the western Ghats of Kerala	Dr. Manju C.Nair	2015-2020	The Zamorin's Guruvayurappan college, Calicut
17	A survey to verify the occurrence of Eurasian Otter *(Lutra lutra)* in Kerala	Dr. Ajith Kumar	2017-2018	Wildlife Biology and Conservation National Centre for Biological Science, Bangalore
18	Survey and documentation of economical and ethnobotanical uses of endemic trees of India	Dr. Sujana K.A	2016-2019	Centre Botanical laboratory, BSI, West Bengal
19	Taxonomy and barcoding of south Indian Carabidae Coleoptera: Carabidae	Dr. Sabu K Thomas	2015-2016	Dept. Of Zoology. St. Joseph's college, Devagiri, Calicut
20	Taxonomic analysis of the genus *Fimbristylis* in South India	DR. R. Prakash Kumar	2015-2018	Malabar Botanical Garden, Calicut
21	Assessment of Amphibian diversity of Kerala	K.P Laladhas	2017	Kerala State Biodiversity Board
22	MSc. Dissertation works in Anamudi Shola National Park	Dr. Jiji K Joesph	2018	Nirmala College, Muvattupuzha
23	Taxonomic studies on the fern family Dryopteridaceae of southern India	Dr. K P. Rajesh	2017-2019	The Zamorin's Guruvayurappan college, Calicut

24	Filed gene bank development of selected medicinal, aromatic and spice plants and characterisation of germplasm	Dr. Sam P Mathew	2017-2018	JNTBGRI, Palode
25	Study on the Millipede fauna in southern Western Ghats of Kerala	Dr. Sudhikumar A. V.	2018-2020	Dept. Zoology, Christ college, Irinjalakuda
26	Monitoring global change impact in Sahyadri (Western Ghats)	Dr. A Krishna Kumar	2018-2020	National Centre for Earth Science studies, GOI
27	Small carnivores of selected Protected Areas of Kerala	Dr. P O Nameer	2018-2019	Dept. Wildlife Science, KAU
28	Restoration and reassessment of selected IUCN listed endangered trees in the Western Ghats	Dr. P A Jose	Up to 2021	KFRI, Thrissur
29	Sustainable tourism development of Protected Areas in the Western Ghats region of Kerala	` Dr. Bindu V T	2018-2020	Dept. of Tourism Management, Avinashilingam Institute for Home science and Higher education for women, Coimbatore
30	Understand the diversity, systematic biogeography and conservation of *Garcinia spp., Aristolochia spp., Coscinium fenestratum, Decalepis spp., Trichpous zylanicus, Hemidesmus Indicus, Costus spp.,*	Dr. V Sundaresan	2018-2019	Centre Institute of Medicinal and Aromatic Research Centre, Bangalore
31	Ecosystem requirements of Hornbills (Great Pied, Malabar Pied, Indian Grey and Malabar Grey Hornbill) and assess the status and distribution of selected mammals in Anjunad and adjoining landscape, Western Ghats	Dr. P. Balasubramanian and Dr. P V. Karunakaran	2019-2020	Landscape Ecology Division, SACON
32	Anatomical profiling of selected *Strobilanthes* species in Kerala	Dr. Hari.N	2017-2020	Dept. of Botany, CMS college, Kottayam
33	Hydrological Investigation in the High Range Mountain Landscape, Kerala	Dr. Dinil Sony. C	May-December 2019	CWRDM

34	Changing climate and Eco hydrology of Shola grassland ecosystem in Southern Western Ghats	Dr. Mahesh Mohan	2015-2018	School of Environment Science, MG University, Kottayam
35	Studies on taxonomy, phytogeography and conservation of South Indian *Habenaria* (Orchidaceae)	Dr. K Prasad	2014-2016	BSI
36	Sociology / new area, sub filed-socio-cultural transformation of Muthuvan and Malapulayan hill tribes of Marayur and Munnar in Idukki district of Kerala	Dr. A. Sridharan	2015-2016	Puthuvai Hospital ,Chennai
37	Phytogeography and conservation of the *Spondias* L. of southern Western Ghats	Dr. C. Anilkumar	2015-2018	JNTBGRI, Palode
38	Study on the echo-calls, ecology, ecosystem services of Michochiropteran Bats of forest and agro-ecosystem of Idukki landscape of Kerala, Southern Western Ghats, India	Sri. Tijo K Joy	January-September 2016	Sarah Tucker College, Tirunelveli
39	Examining connectivity of Protected Areas in the Western Ghats of Kerala and suggesting potential corridors	Dr. Uma Balakrishnan	2015	National Centre for Biological Sciences, Bangalore
40	Taxonomic and molecular studies on the genus *Arisaema* C. Martius (Araceae) in India	Dr. Santhosh Nampy	2014-2017	Dept. Botany, University of Calicut
41	Plant metabolomics studies in the genus *Embelia* found in Kerala	Dr. A V Raghu	2015-2017	KFRI, Thrissur
42	Versatility of forest litter bacteria isolated from virgin Tropical Rainforest and their degradation potential of organic debris in grey water	Dr. Mahesh Mohan	2014-2017	MG University, Kottayam
43	A study on the biodiversity of ants in Kerala State	DR. Kalesh S	2015-2017	Travancore Natural History Society, Thiruvanthapuram
44	A comprehensive systematic study of the genus *Jasminium* L. from Kerala	Dr. Devipriya V	2015-2018	Dept. of Botany, Sree Narayana College, Kollam

45	Molecular cahracterisation and screening for molecular markers associated with essential oil production in selected members of *Jasminium* L. from Kerala	Dr. Devipriya V	2015-2018	Dept. of Botany, Sree Narayana College, Kollam
46	Bio-cultural diversity, environment and sustainable development	Sathyanarayanan	Dr. 2014-2015	Anthropological Survey of India, Southern Regional Centre, Mysore
47	Taxonomic studies on the Blowflies (Diptera: Calliphoridae) from Western Ghats	Dr. Meenakshi Malhothra	2015-2018	Dept. of Zoology and Environmental Sciences, Punjabi University, Patiala
48	Development and maintenance of conservatories: Wild Fruit Plants	Sri S.M Shareef	2012-2014	JNTBGRI, Palode
49	Phytogeography of King Cobras *(Ophiophagushannah)* across the sub-continent	Dr. Karthik Shankar	2015-2017	Centre for Ecological Sciences, IIS, Bangalore
50	Biodiversity of foliar Mycobionts of Myristica swamps of Kerala-A Critically Endangered ecosystem of Western Ghats	Dr. Archana G R	2015-2017	St. Gregorious college, Kottarakkara
51	Saving 10 Rare, Endemic and Threatened (RET) tree species of Western Ghats, India	Sri V. V Sivan	2015-2017	M.S. Swaminathan Research Foundation, Community Agro biodiversity Centre
52	Analysis of inter specific variations in the genus Leea D.Royen ex. L. from Kerala	Dr. Devipriya	2015-2017	Dept. of Botany, Sree Narayana College, Kollam
53	Taxonomy seed morphology and ecology of Great Hornbill dispersed Rain forest trees of Southern Western Ghats, Kerala	Dr. A.K. Pradeep	2014-2020	Dept. of Botany, University of Calicut
54	Establishment of aquatic plant conservatory, Lower plant conservatory and Angiosperm conservatory	Dr. R. Prakash Kumar	2011-2015	Malabar Botanical Garden, Calicut
55	Population studies and gene flow system of endemic and endangered plant species of the Western Ghats	Sri. P.S. Jothish	2015-2019	JNTBGRI, Palode

56	A study on the Jasmine Varieties of Western Ghats producing high essential oil content with special emphasis on commercialization of essential oil for perfumery by rural women for their empowerment.	Dr. S.R. Suja	2015-2018	JNTBGRI, Palode
57	Survey and collection of specimens at Anamudi Shola National Park	Dr. P.S. Udayan	2015	Sree Krishna College, Guruvayur
58	Survey and documentation of the faunal wealth of Kerala State	Dr. P.M. Sureshan	2014-2018	ZSI
59	Angiosperm diversity of Idukki district	Prof. Santhosh Nampy	2017-2019	Dept. of Botany, University of Calicut

ANNEXURE 3.6

603

CENTRAL EMPOWERED COMMITTEE

(CONSTITUTED BY THE HON'BLE SUPREME COURT OF INDIA IN WRIT PETITION NO. 202/95 AND 171/96)

CAMP: - Thiruvananthapuram

Dated 30-09-2003.

F. No. I-20/CEC/2002

To,

1. **The Secretary,**
   Public Works Department,
   Government of Kerala.
   Thiruvananthapuram.
2. **The Principal Secretary.**
   Forest &Wildlife Department,
   Government of Kerala,
   Thiruvananthapuram

MS - see in Memo de file

Sub:-Hearing of Application No. 233 filed by WWF-I regarding construction of road passing through Mannavan Shola Reserve Forest in Munnar Forest Division in alleged violation of Forest (Conservation) Act, 1980 and Hon'ble Supreme Court's order dated 12-12-1996.

Sir,

30/9

During the hearing of the Application No. 233 filed before the Central Empowered Committee (CEC), it has been brought to the notice of the CEC that the construction/widening of the above road is being undertaken by the State PWD in violation of the Forest (Conservation) Act, 1980 and the Hon'ble Supreme Court's order dated 12-12-1996.

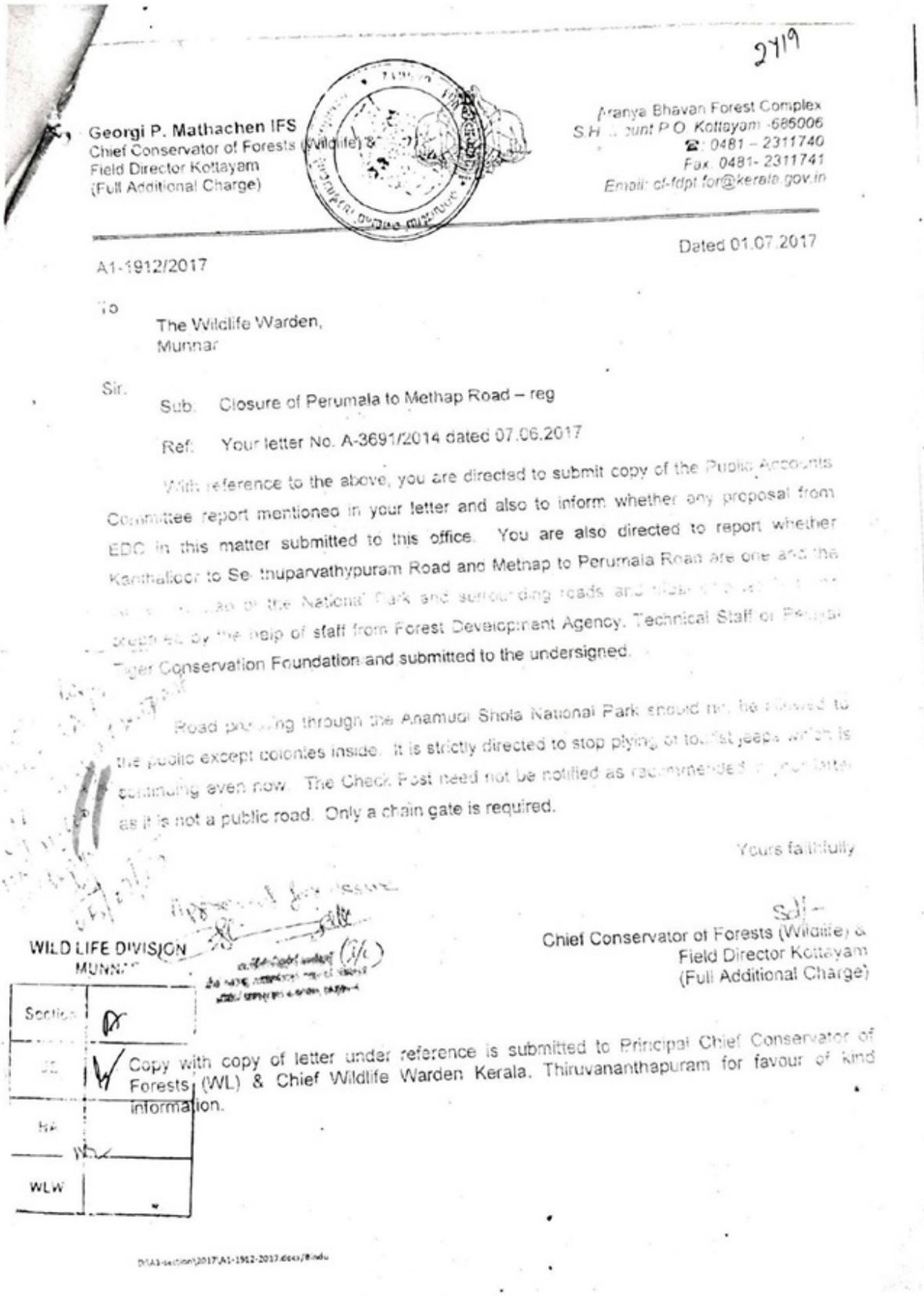
As informed during the hearing, it shall be ensured that the work of construction/widening of the said road is immediately stopped.

(M.K.Jiwrajka)
Member Secretary.

Copy for information and necessary action to

1. Principal Chief Conservator of Forests, Kerala Forest Department.
2. Conservator of Forests, High Range Circle, Kottayam.
3. Divisional Forest Officer, Munnar.

ANNEXURE 3.7



2419

Georgi P. Mathachen IFS
Chief Conservator of Forests (Wildlife) &
Field Director Kottayam
(Full Additional Charge)

Aranya Bhavan Forest Complex
S.H. ... unt P.O. Kottayam -686006
☎: 0481 – 2311740
Fax: 0481- 2311741
Email: cf-fdpt.for@kerala.gov.in

A1-1912/2017

Dated 01.07.2017

To

The Wildlife Warden,
Munnar

Sir,

Sub: Closure of Perumala to Methap Road – reg

Ref: Your letter No. A-3691/2014 dated 07.06.2017

With reference to the above, you are directed to submit copy of the Public Accounts Committee report mentioned in your letter and also to inform whether any proposal from EDC in this matter submitted to this office. You are also directed to report whether Kanthalloor to Se thuparvathypuram Road and Methap to Perumala Road are one and the ... ...ea of the National Park and surrounding roads and ... prepared by the help of staff from Forest Development Agency, Technical Staff of ... Tiger Conservation Foundation and submitted to the undersigned.

Road passing through the Anamudi Shola National Park should not be allowed to the public except colonies inside. It is strictly directed to stop plying of tourist jeeps which is continuing even now. The Check Post need not be notified as recommended in your letter as it is not a public road. Only a chain gate is required.

Yours faithfully

Sd/-

Chief Conservator of Forests (Wildlife) &
Field Director Kottayam
(Full Additional Charge)

WILD LIFE DIVISION
MUNNAR

Section	
	Copy with copy of letter under reference is submitted to Principal Chief Conservator of Forests (WL) & Chief Wildlife Warden Kerala, Thiruvananthapuram for favour of kind information.
WLW	

D:\A1-section\2017\A1-1912-2017.docx/Rindu

ANNEXURE 6.1

Recommendations of the Sub-Committee on Guidelines for Roads in Protected Areas.

In pursuance to the decision taken by the Standing Committee of the NBWL in its 28th Meeting held on 20th March 2013, a sub-committee under the chairmanship of Dr. M.K. Ranjitsinh, Member, National Board for Wildlife, was constituted by the Ministry of Environment and Forests vide O.M. No. 6-62/2013-WL dated 26th June 2013. The terms of reference of the sub-committee are as follows:

- To frame a comprehensive guideline for construction/repair or roads passing through PA in the country
- Design best practices for such roads passing through PAs so as to have better wildlife conservation

The 1st meeting of the sub-committee was convened on 2nd July, 2013.The second meeting of the sub-committee was convened on 6th August, 2013. The list of participants-who attended both the meetings are given in **Annexure-1.**

PREAMBLE

Background

Roads are an essential part of India's development, providing vital connectivity and transportation across the country. Yet, when they intersect natural areas (as opposed to being situated in already-modified human-dominated landscapes), roads have wide-ranging and complex impact on natural areas and wild species inhabiting these areas. Within India's Protected Areas, the extensive impact of roads remains poorly understood, except in the obvious and serious instance of wild animal mortality due to road accidents. Elsewhere, it was been well-established that roads have detrimental ecological effects in both terrestrial and aquatic natural ecosystems. Roads further fragment the already highly fragmented natural habitats. They break forest contiguity, impinge on forests and well-worn migratory paths of animals, break tree cover and canopy, slice vegetation—all of which gravely impact wildlife. Roads cause soil erosion and landslides. Crucially, roads are the first step to ancillary development and an increasing human footprint in the area, thus leading to

accelerated developmental, tourist and hunting pressures, increase in pollution, litter, and various disturbances. Unless great vigilance and checks are provided, roads provide conduits for illegal extraction of timber and forest produce and for poaching, particularly at night, from vehicles. It is very difficult to provide the requisite surveillance and it is well-established that PAs have suffered loss of vegetative cover and poaching after construction of roads. In PAs in the mountainous region , construction of roads and their widening has grave consequences, including landslides and erosion, as the debris from road cuts on hillsides is invariably tipped over the sides. A background paper on linear intrusions into natural areas, including roads, commissioned by the National Board for Wildlife in 2011, provides an exhaustive review of the current state of knowledge on this topic[1], and a companion document[2] provides detailed guidelines by which their negative impact on natural habitats and wild species, can be minimised.

BASIC PRINCIPLES

We wish to reiterate a point articulated clearly and emphatically in the **National Wildlife Action Plan – 2002-2016,** which states that the "*Ministry of Surface Transport... to plan roads, highways, expressways in such a manner that all national parks and sanctuaries are by-passed and integrity of the PA is maintained. Wildlife corridors also need to be avoided, or mitigative measures (such as restricting night traffic) need to be employed.*" This principle must serve as the cornerstone of any road plan that is being conceived in the vicinity of any wildlife or Protected Area, and envisages the Ministry of Surface Transport to work in coordination with the Ministry of Environment & Forests, and other relevant authorities and experts. Further, we believe that this principle must apply to all other roads being planned by any other agency at the national, state, or local levels. The implication of this action point articulated in the National Wildlife Action Plan (NWAP) is also that plans be made proactively by relevant agencies to realign existing roads passing through protected areas, in a way that PAs are bypassed and, subsequently, decommission roads that intersect PAs.

[1] Raman, T. R. S. 2011. Framing ecologically sound policy on linear intrusions affecting wildlife habitats: Background paper for the National Board for Wildlife. Available from: envfor.nic.in/assets/Linear%20intrusions%20background%20paper.pdf

[2] NBWL. 2011. Draft guidelines for linear infrastructure intrusions in natural areas: roads and powerlines. Available from: http://envfor.nic.in/assets/FIRSTDraft%20guidelines%20roads%20and%20powerlines.pdf

If there are viable alternative alignments—as observed in a number of cases—to roads that otherwise intersect PAs, those within PAs must gradually be phased out and eventually decommissioned, while the alternate road should be improved. This must be done in active coordination with the relevant ministries, departments and authorities, as noted above.

In planning roads, within and in the vicinity (defined here as roads that are situated inside and within 1 km radial distance) of protected areas, we recommend that following fundamental principles must be followed in order of priority: Avoidance, Realignment, Restoration.

1. ***Principle of Avoidance*:** The foremost option would be to altogether avoid areas that are within or in the vicinity of any Protected Area and to find alternatives that are socially and ecologically more appropriate.
2. ***Principle of Realignment:*** This follows as a corollary of the first principle. Road projects must investigate and demonstrate that they have considered other alternative routes that avoid natural areas of high ecological value. This must be an integral feature of a project proposal and implementation documents. Realignments must also be developed in a transparent manner through consultation with local communities affected by the routing and subject to ecological and wildlife considerations.

   User agencies seeking clearances for roads must demonstrate as to how they have taken these factors into account, before their proposals can be considered for approval by the SC-NBWL.
3. ***Principle of Restoration:*** In natural areas, existing roads that are in disuse (e.g., old logging roads), or evaluated to be inefficient or detrimental to their objects, shall be targeted for decommissioning and subsequent ecological restoration, as the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed.

The Deputy Inspector General of Forests (WL) briefed the committee regarding the existing guidelines for roads within Protected Areas, viz.:

(i) Decision of the Standing Committee of IBWL, as per decision taken during the meeting held on 14.6.2000. This held that roads that have already been tarred should continue to be maintained and repaired properly, in the current form. No roads inside the National Parks and Sanctuaries should be widened or upgraded.

(ii) During the meeting of 14th October 2011, it indicated that "*No widening of existing roads shall be permitted, and the status of finishing of the surface of the repaired road(s) shall remain same as that of the original road(s), i.e.,*

untarred roads shall remain untarred after repairs, and only originally tarred roads shall be repaired and tarred."

Recommendations

: The committee recommends the following:

1. The *status quo* of the roads passing through National Parks and Core Critical Tiger Habitats (CTH) shall remain the same. The roads could be maintained and repaired in the best manner possible in their current form and present width. No widening or upgradation is to be allowed. If it is an existing tarred road, it shall be maintained as such and no widening of the tarred surface or the widening of the road itself, may be done.
2. For Wildlife Sanctuaries and Conservation Reserves, the same norms as in the case of National Parks and Core, Critical Tiger habitats, shall apply. However, in case of Sanctuaries and Conservation Reserves, culverts and metalling in sections of roads that become impassable or 'all weather roads' for approach/connectivity to villages within the Protected Areas, can be considered for approval in the Standing Committee of NBWL. If necessary in such cases, required maintenance could be taken up by the Forest Dept. on the recommendation of the Standing Committee of NBWL. It may be stressed again, that the width and status of the existing roads shall remain the same and no upgradtion will be allowed. In considering such proposals, the method of such road construction/improvement such as blasting, borrow-pit digging, etc., the impact upon movement of animals from one habitat to another/wildlife corridors, access of water, etc. would be criteria for consideration.
3. Where roads approaching / passing by National Parks/Core-Critical Tiger Reserve/Wildlife Sanctuary are within a radius of 1 km thereof, or within the Eco-Sensitive Zone, whichever of the two is lesser, would be treated on same basis/guidelines as are applicable to the Protected Areas category that it is in proximity of.
4. Presently, as Community Reserves are outside the purview of Section 29 of Wildlife (Protection) Act, 1972, the committee decided not to delve into the matter of roads passing through such PAs.

1. The committee recommended that, no change of current ownership and maintenance of roads passing through the Protected Areas should be permitted. However, in specific cases where such a transfer is required to better manage

roads so as to cause minimal impacts on wildlife, as in the case of transfer of certain PWD /other roads which pass through PAs, back to the concerned Forest Dept. such transfers could be considered.

5. Roads being managed by the Forest Department for the purpose of patrolling and tourism, were of equal concern like other roads inside Protected Areas. It was noted that there was a large network of such roads in several National Parks/Tiger Reserves/Wildlife Sanctuaries. No new roads should be constructed by the concerned Forest Departments and if so required to be constructed, the approval of the National Tiger Conservation Authority (in case of Tiger Reserves) and concerned State Boards for Wildlife in case of non-Tiger Reserve for other PAs., must be obtained. The concerned authority should be able to demonstrate and justify the grounds for construction of the new roads within PAs, in the conservation interest of the concerned PA.

6. The committee also agreed that the Wildlife Institute of India should formulate guidelines - for making roads by the Forest Departments, for protection purposes, in Protected Areas, Critical Wildlife Habitats and designated corridors.

Management of roads within PAs:

Mitigation: For existing roads, repairs and maintenance of existing roads, and for repairing roads that are impassable during monsoon/all-weather roads as described in the recommendations above, it is imperative that mitigation measures are included in the project planning, design, budget, implementation, and monitoring stages. This requires measures to minimise detrimental effects of roads on ecology, wildlife, local communities and users. This shall be considered only for existing structures and for new cases, where the options given earlier have been comprehensively considered and overruled, with adequate justification. These are also subject to requisite approvals from the state authorities and boards, the Ministry of Environment and Forests and its statutory bodies, such as the National Board for Wildlife, Forest Advisory Committee, and the National Tiger Conservation Authority, as relevant to each case.

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LIST OF PARTICIPANTS ATTENDING THE FIRST MEETING OF THE SUB-COMMITTEE CONSITUTED TO FRAME GUIDELINES FOR ROADS WITHIN PROTECTED AREAS, HELD ON 2nd JULY 2013.

1	Dr. M.K. Ranjitsinh Member, NBWL	Chairman
2	Ms. Prerna Bindra Member, NBWL	Member
3	Shri S.W.H. Naqvi Pr. Chief Conservator of Forests (WL) and Chief Wildlife Warden, Maharashtra	Member
4	Shri. G.P. Verma Chief Conservator of Forests, Madhya Pradesh	Member
5	Shri H.S. Negi Inspector General of Forests, NTCA	Member
6	Shri Vivek Saxena Deputy Inspector General of Forests (WL), MoEF	Member-Secretary

*****ANNEXURE-II**

LIST OF PARTICIPANTS ATTENDING THE SECOND MEETING OF THE SUB-COMMITTEE CONSITUTED TO FRAME GUIDELINES FOR ROADS WITHIN PROTECTED AREAS, HELD ON 6th AUGUST 2013.

1	Dr. M.K. Ranjitsinh Member, NBWL	Chairman
2	Ms. Prerna Bindra Member, NBWL	Member
3	Shri. Jitendra Agarwal Addl. Principal Chief Conservator of Forests (WL), Madhya Pradesh	Member
4	Shri A.K. Mishra Chief Conservator of Forests (WL) Representing the Chief Wildlife Warden, Maharashtra	Member
5	Dr. Asha Rajvanshi Scientist-G, Wildlife Institute of India, Dehradun	Member
6	Dr.M.D. Madhusudan NCF, Mysore and Member, NBWL	Member
7	Shri Vivek Saxena Deputy Inspector General of Forests (WL), MoEF	Member-Secretary

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ANNEXURE 10.1

LIST OF CONTROL FORMS

FORM - 1

CREATION OF NEW ARTIFICIAL WATERHOLES

Sl. No	Category	Year	Location	Cost	Performance
1	2	3	4	5	6

Category : Masonry anicut, earthen bund, lined depression, bore well and pump, reservoir, spring fed, tanker fed, guzzler, aquifer; permanent or temporary.

Location : By compartment or by a named feature and name given if any.

Performance : Successful, partially successful, failure (give reasons for the latter two).

FORM - 2

MAINTENANCE OF WATERHOLES: NATURAL

Sl. No	Category	Perennial or seasonal	Location	Year	Nature of work	Cost	Performance
1	2	3	4	5	6	7	8

Category : Spring, seep, natural depression, a flowing stretch, reservoir.

Location : By compartment or by a named feature and name given if any.

Nature of work : Desilting, provision of apron, any other category.

Performance : Successful, partially successful, failure (give reasons for the latter two).

FORM - 3

MAINTENANCE OF WATERHOLES: ARTIFICIAL

Sl. No	Category	Perennial or seasonal	Location	Year	Nature of work	Cost	Performance
1	2	3	4	5	6	7	8

Category : Masonry anicut, earthen bund, lined depression, bore well and pump, spring fed, guzzler, aquifer etc.

Location : By compartment or by a named feature and name given if any.

Year : Year of maintenance, with year of establishment in parenthesis.

Nature of work : Desilting, grouting, repairing leaks, repair to mechanical parts, closing anicut openings, any other work.

Performance : Successful, partially successful, failure (give reasons for the latter two).

FORM - 4

RESTORATION OF HABITAT: WEED CONTROI

Sl. No	Location & name of site	Year	Extent of area(Ha)	Species of weed	Operation	Total Cost	Cost/ha	Remarks
1	2	3	4	5	6	7	8	9

Location : By compartment, site name or land feature.

Operation : Uprooting, cutting, burning, ploughing, manual or by using animals or machinery.

Remarks : Measure of success and or problem faced.

FORM - 5

RESTORATION OF HABITAT: PRESCRIBED BURNING

Sl. No	Location & name of site	Year	Extent of area (Ha)	Area treated (ha)	Period	Total Cost	Cost/ha	Remarks
1	2	3	4	5	6	7	8	9

Location : By compartment or name of site.

Period : Date of starting operation and completion.

Remarks : Mention resultant structure e.g. a mosaic, % burnt, % intact problems encountered in conducting the operation – e.g. fire escape.

FORM - 6

RESTORATION OF HABITAT: SOIL CONSERVATION MEASURES – INITIAL OPERATIONS AND SUBSEQUENT MAINTENANCE

Sl. No	Location & name of site	Year	Extent of area (Ha)	Area treated (ha)	Operations	Total Cost	Cost/ ha	Remarks
1	2	3	4	5	6	7	8	9

Location : By compartment, name of site or landmarks.

Extent of area : Total area identified for such treatment. In case of streams or gullies, the length involved.

Area treated : If linear feature then quote length; otherwise area.

Operation : Structures involved such as gully plugs, trench-cum-mound, terracing, spursand bunds etc. quote quantity nos. and cmt. of earthwork.

Remarks : Mention if initial work or maintenance.

FORM - 7

RESTORATION OF HABITAT

Sl. No	Location	Year	Extent of area (ha)	Description of site	Regulations or protection measures	Response	Remarks
1	2	3	4	5	6	7	8

Location : By compartment or landmarks.

Description : % tree, shrub, ground cover, main species, impact of factors causing perturbations.

Regulations & protection measures : Social fencing, power or other kind of fencing, enforced protection by patrolling, fire protection etc.

Response : To be recorded annually. Consider trend of regeneration, vegetation. cover, change in structure and composition, wildlife use index.

Remarks : Site problems or any other useful information, including alternatives if area being used by people for specific purposes.

FORM - 8

ANIMALS: MEASURING TRENDS IN POPULATIONS

Sl. No	Species	Population estimation methodology	Adult		Sub-adults		Yearlings	Fawns	Cubs	Total	Remarks
			Male	Female	Male	Female					
1	2	3	4	5	6	7	8	9	10	11	12

Population estimation : e.g. pugmark, line transect, scan, roadside counts etc., area covered, sampling intensity, data treatment, extrapolation where involved. In case of indices of density. or dung count mentions those figures under the remarks column; use details as pertinent. Describe age classes for each species.

Remarks : Operational problems, protection problems, any other useful information. Indices of density or dung count details to be recorded here.

FORM - 9

ANIMALS: NEW RECORDS

Sl. No	Species	Location	Year	How discovered	Details of number, age, sex	Habitat description	Remarks
1	2	3	4	5	6	7	8

Animal will include vertebrates and invertebrates

How discovered : Sighting, dead specimen, reliability of sighting, captured specimen, incontrovertible other evidence.

Number, age, sex etc. : As applicable to vertebrates

Habitat description : Broad habitat description such as vegetation, and elements such as water, large old trees, den trees, snags, down log material. Use microhabitat descriptors only if relevant.

FORM - 10

ANIMALS: MORTALITY OTHER THAN THAT ATTRIBUTABLE TO AN OFFENCE

Sl. No	Species	Location	Year	Sex and age	Number	How discovered	Cause of mortality	Remarks
1	2	3	4	5	6	7	8	9

Location : By compartment, landmark etc.

Sex and age : As per parameters for age class. Sex, if possible to identify.

How discovered : Carcass, complete or partial. Skull or any other recognizable remains collected where only some remains of an animal are found.

Cause of mortality : If known e.g. territorial fight, accident, possible disease (following post-mortem results), old age causes difficult to determine, predation etc.

Remarks : Any other useful information.

FORM - 11

ANIMALS: MORTALITY ATTRIBUTED TO POACHING OR AN ACT OF VANDALISM

Sl. No	Species	Location	Cause of mortality, number, sex and age class	Remarks
1	2	3	4	5

Location : By compartment or landmarks.

Cause of mortality : Whether the animal was intact or remains found, article or trophy to be recorded. Cause if known such as animal snared, shot or poisoned etc.

Remarks : Any other useful information, especially matters of illegal trade.

FORM - 12

ANIMALS: PREDATION ON DOMESTIC LIVESTOCK BY WILD CARNIVORES

Sl. No	Range	Month	Category of livestock killed	Location	Numbers	Compensation paid (Rs.)	Carnivore involved	No. of cases undecided	Remarks
1	2	3	4	5	6	7	8	9	10

Category of live : Buffalo, cow, bullock (adult, sub-adult, calf), camel, horse, donkey, stock killed sheep, goat, poultry etc.

Location : Comptt. no. or landmark where killed and the village of the owner.

Carnivore involved : Indicate species responsible for the kill if identity is confirmed.

No. of cases undecided : Either in progress or dropped.

Remarks : Record observations like - attended or unattended animal, killed in forest or waterhole or in the pen/shed, field and whether kill was in area closed to livestock trespass.

FORM - 13

ANIMALS: KILLING OF A HUMAN BY WILDLIFE OR INJURY CAUSED

Sl. No	Range	Month	No. of incidents	No. of people killed, age & sex	Number	How discovered	Cause of mortality	Remarks
1	2	3	4	5	6	7	8	9

Location, circumstances and species: Location by comptt. no., the village to which the person belongs and a description of the site and activity such as – open grassy patch, cutting grass; or under a mahua tree collecting flowers etc. Mention species on proof.

FORM - 14

ANIMALS: WILDLIFE DAMAGE TO PRIVATE OR PUBLIC PROPERTY

Sl. No.	Range	Month	The category of property	Extent of damage	Species evolved and number	Remarks
1	2	3	4	5	6	7

Location : By comptt. no., village survey no., name of village or landmark.

Category of property : eg. agriculture field-wheat, huts in a village, any kind of vehicle.

Extent of damage : Crop damage by area, estimated loss of produce and monetary loss. Similar yardsticks for other items like partial or total destruction of huts and belongings with estimated monetary loss

Remarks : Any relevant information or circumstances eg. a wild elephant was provoked by people.

FORM - 15

PLANTS: NEW RECORDS

Sl. No	Range	Kind of produce	Species	Quantity realised (Rs.)	Revenue	Free of change quantity	Agency involved	
							Local people	Outsiders
1	2	3	4	5	6	7	8	

Kind of produce: Mention name, can be biological or geomorphic in origin.

Species : If applicable.

Quantity : Use the appropriate unit.

Local people : Applies to people within TUZ & ZI (buffer). This return normally applies to TUZ & buffer. If practice exists within the PA, make a special mention.

FORM - 16

NWFP COLLECTION: PLANTS AND OTHER PRODUCE

RAANGE:

Sl. No	Year	Kind of produce	Species	Quantity realised (Rs.)	Revenue	Free of change quantity	Agency involved	
							Local people	Outsiders
1	2	3	4	5	6	7	8	

Kind of produce : Mention Name, can be biological or geomorphic in origin.

Species : If applicable.

Quantity : Use the appropriate units.

Local people : applies to people within TUZ & ZI (buffer). This return normally applies to TUZ &(buffer). If practice exists within the PA, make a special mention.

FORM - 17

GRAZING OF DOMESTIC LIVESTOCK

YEAR:

Sl.	Grazing unit No.	List of villages in the unit	Village-wise listed population of cattle	Capacity of the unit(cattle units) an number of cattle grazed	Total cattle unit grazed		Remarks
					Legal	Illegal	
1	2	3	4	5	6	7	8

Remarks : (1) Mention number of cattle immunized against FMD, RP, anthrax as the case might be and the number of cattle without the prophylactic cover.

(2) If grass is allowed to be cut for cattle being stall-fed, mention the village and number of such cattle.

FORM - 18

INTER-AGENCY PROGRAMS: AGENCIES AND SCHEMES (GOVERNMENT)

YEAR:

Sl. No	Name of agency	Central/ State	/Number and name of scheme operated	Physical & financial targets		Area & location	Remarks
				Given	achieved		
1	2	3	4	5	6	7	8

Name of the scheme : To include all activities in the Govt. Sector, ie. Construction use of resources, development processes etc. Mention name of schemes, projects or normal operations. This will address all departments in the management area and those activities outside but capable of influencing the management area.

Remarks : Success, adverse impacts, incompatibility with PA management objectives or failures should be mentioned. Detailed notes to go in the PA book.

FORM - 19

PROGRAMS OF NGOS

YEAR:

Sl. No	Name of agency	HQ location	Nature of the scheme operated	Physical & financial targets		Area & location	Remarks
				Given	achieved		
1	2	3	4	5	6	7	8

Remarks : Success or adverse impacts, incompatibility with PA management objectives or failures should be mentioned. Detailed notes to go in the PA Book. These PROGRAMS and activities could be within the management area or those that are outside the management area but are capable of influencing the state of the management area – either complementing efforts or adversely impacting.

FORM – 20-A

CONSTRUCTION OF INFRASTRUCTURE: ROADS AND BRIDGES (NEW)

RANGE:

Sl. No	Year	Category	Surface	Name or number	Length covered	Cross, drainage works, bridges with type	Total cost and status
1	2	3	4	5	6	7	8

Category of road: National/State highway, district road etc. public road or open only to managers should be stated.

Surface type : Block topped, metal, earth etc. Applies to roads.

Name or number: As the case may be.

Cross drainage type : eg. for culverts – box, hume pipe culverts etc.

Bridge type : Wooden trestle, suspension, metal multi span, masonry arch etc.

Status : Work completed or ongoing. State also the agency responsibility; state whether operational or non-operational.

FORM – 20-B

MAINTENANCE OF INFRASTRUCTURE: ROADS AND BRIDGES (EXISTING)

RANGE:

Sl. No	Year	Category	Surface	Name or number	Length covered	Cross, drainage works, bridges with type	Total cost and status
1	2	3	4	5	6	7	8

Category of road: national/State highway, district road etc. Public road or open only to managers should be stated

Surface type : Black toped, metal, earth etc. Applies to road.

Name/number : as the case may be

Cross drainage type : eg. for culverts-box, humepipe culverts etc.

Bridge Type : Wooden trestle, suspension, metal multi span, masonry arch etc.

FORM – 21-A

CONSTRUCTION OF INFRASTRUCTURE: BUILDINGS (NEW)

RANGE:

Sl. No	Year	Nature of the building	Location	Type of construction	Number	Total cost	Status
1	2	3	4	5	6	7	8

Nature of the building : eg. residential(Guard), office, store, chauki, watch tower, tourist facility, hide, barrier, patrolling camp (temporary or permanent) etc.

Location : By compartment or village or landmark as appropriate.

Type of construction : Masonry (brick/stone), log or wooden, metal, local material etc.

Status : Completed or ongoing.

FORM – 21-B

MAINTENANCE OF INFRASTRUCTURE: BUILDINGS (EXISTING)

RANGE:

Sl. No	Year	Nature of the building	Location	Type of construction	Number	Total cost	Status
1	2	3	4	5	6	7	8

Nature of the building : eg. residential(Guard), office, store, chauki, watch tower, tourist facility, hide, barrier, patrolling camp (temporary or permanent) etc.

Location : By compartment or village or landmark as appropriate.

Type of construction: Masonry (brick/stone), log or wooden, metal, local material etc.

Status : Completed or ongoing.

FORM – 22-A

DEVELOPMENT OF INFRASTRUCTURE: COMMUNICATION (NEW)

RANGE:

Sl. No	Year	Name of facility	Location	Number	Cost	Advantage gained	Remarks
1	2	3	4	5	6	7	8

Type of facility : eg. telephone, wireless

Location : Staff Hq. location, village, landmark etc.

Advantage gained : Area's served, staff locations connected etc.

Remarks : Record status – complete, ongoing, functional, non-functional.

FORM – 22-B

MAINTENANCE OF INFRASTRUCTURE: COMMUNICATION (EXISTING)

RANGE:

Sl. No	Year	Name of facility	Location	Number	Cost	Advantage gained	Remarks
1	2	3	4	5	6	7	8

Type of facility : eg. telephone, wireless

Location : Staff Hq. location, village, landmark etc.

Advantage gained : Area's served, staff locations connected etc.

Remarks : Record status – complete, ongoing, functional, non-functional.

FORM – 23-A

DEVELOPMENT OF INFRASTRUCTURE: VEHICLES (NEW)

RANGE:

Sl. No	Year	Kind of vehicle	Number	HQ if any	Intended use	Cost	Remarks
1	2	3	4	5	6	7	8

Kind of vehicle : Jeep, trailer, tractor, truck, minibus, tanker, motorcycle, bicycle, boat (paddle or motor), launch, car, riding elephant, ponies, etc.

Intended use : Management support, patrolling/ant poaching, tourism etc.

Remarks : Any other useful information. Mention written off vehicles, retired or dead animals.

FORM – 23-B

MAINTENANCE OF INFRASTRUCTURE: VEHICLES (EXISTING)

RANGE:

Sl. No	Year	Kind of vehicle	Number	HQ if any	Intended use	Cost	Remarks
1	2	3	4	5	6	7	8

Kind of vehicle : Jeep, trailer, tractor, truck, minibus, tanker, motorcycle, bicycle, boat (paddle or motor), launch, car, riding elephant, ponies, etc.

Intended use : Management support, patrolling/ant poaching, tourism etc.

Remarks : Any other useful information. Mention written off vehicles, retired or dead animals.

FORM – 24-A

DEVELOPING INFRASTRUCTURE: CONSTRUCTION OF BOUNDARIES FENCES, CPTS, EPTS, ENCLOSURES,

ENCLOSURES (NEW)

YEAR:

Sl. No	Category of construction	Range	Location	Length (Mt)	Number	Specification	Remarks
1	2	3	4	5	6	7	8

Category : Kind of boundary eg. comptt, block, zone etc. In case of fences: power fence, others

Location : By compartment or suitable landmark.

Numbers : In case of exclosures, enclosures, number of pillars etc. as applicable.

Specifications : As applicable to the construction: dry rubble, chain link, local material, height, area, depth, width etc.

Remarks : Any other relevant information.

FORM – 24-B

DEVELOPING INFRASTRUCTURE: CONSTRUCTION OF BOUNDARIES FENCES, CPTS, EPTS, ENCLOSURES,

ENCLOSURES (EXISTING)

YEAR:

Sl. No	Category of construction	Range	Location	Length (Mt)	Number	Specification	Remarks
1	2	3	4	5	6	7	8

Category : Kind of boundary eg. comptt, block, zone etc. In case of fences: power fence, others

Location : By compartment or suitable landmark.

Numbers : In case of exclosures, enclosures, number of pillars etc. as applicable.

Specifications : As applicable to the construction: dry rubble, chain link, local material, height, area, depth, width etc.

Remarks : Any other relevant information.

FORM – 25-A

DEVELOPING INFRASTRUCTURE: FIRELINES (NEW)

RANGE:

Sl. No	Year	Fireline Category or width	Name of points connected	Length (Mt)	Cost	Remarks
1	2	3	4	5	6	7

Category : Main or subsidiary etc. Record width

FORM – 25-B

DEVELOPING INFRASTRUCTURE: FIRELINES (EXISTING)

RANGE:

Sl. No	Year	Fireline Category or width	Name of points connected	Length (Mt)	Cost	Remarks
1	2	3	4	5	6	7

Category : Main or subsidiary etc. Record width

FORM – 26

TOURISM

Total number of visitors all categories : Year :

Name of complex : Total revenue earned:

Sl. No.	The category of visitors by month & number					Indian		Revenue	Day visitors		Staying overnight	
	Adult			Children	Foreigners	Rural	Urban		No	Revenue	No	Revenue
	Month	Male	Female									
1	2	3	4	5	6	7	8	9	10	11	12	13

Column 2 to 5 will be written in three successive lines for the month pertinent, one below then other. First line information pertains to foreign tourists. Put a tick (_/) in col. 6. Second and third line details rural and urban tourists respectively. Put a tick (_/) in Col. 7, Column 8 as applicable

FORM - 27

OUTBREAK OF FIRES

RANGE:

Sl. No	Year	Location	Extant (ha)	Dates		Reason/s	Estimated loss	Remarks
				Detected	Controlled			
1	2	3	4	5		6	7	8

Location : By compartments.

Reasons : Established or suspected.

Estimated loss : eg. number of trees damaged, stacked firewood/timber/bamboo destroyed/ damaged by volume and cost, wild animals dead, particulars of sensitive sites affected, other property or life destroyed.

Remarks : State particularly problems encountered in detection and suppression and any other useful information. State also whether the extent of fire has been mapped.

FORM – 28

OFFENCE CASES DETECTED

RANGE:

Sl. No	Year	Category	Numbers	No. of cases detected		No. of cases under procests	No. of cases compo-unded	Remarks
				Successful	Failure			
1	2	3	4	5		6	7	8

Category : eg. illegal cutting of trees, illegal firewood, illegal NWFP, poaching, encroachment, illegal cattle grazing etc. category be codified by letters of alphabet.

Remarks : Any other useful information. This should also include the number of cases pending decision with the Department. The cases under column 8 pertain to area of non-PA status under management which do not involve an endangered species (Schedule-I).

FORM – 29

INCENTIVES AND AWARDS

RANGE:

Sl. No	Year	No. of recipients of incentives s for detecting offences	Amount paid (Rs.)	Kind of award	No. of recipient	Remarks
1	2	3	4	5	6	7

Kinds of award : eg. a medal like the Shaurya Chakra, any other such awards instituted by theState or Central Government, includes citations, extra increments etc.

Remarks : Any other useful information. If an award carries cash, mention the amount.

FORM - 30

RESEARCH PROJECTS UNDER IMPLEMENTATION THROUGH PA MANPOWER WITH OR WITHOUT COLLABORATION WITH OTHER AGENCIES

RANGE:

Sl. No	Year	Title	Completed	Ongoing	New	Status	Financial outlay (Rs.)	Expenditure incurred (Rs.)	Remarks
1	2	3	4	5	6	7	8	9	10

Completed : State date of completion and the status of the project report

Ongoing : State since when the project is under operation and expected period of completion

New : State the date of commencement and duration.

Status : State the progress towards achievement of objectives; or project which has been dropped or held in abeyance etc.

Remarks : Any other relevant information. If the project is in collaboration with any other agency or is a contractual arrangement, state the situation and the name of the collaborating agency. If animal/plant specimen are being collected, state authority and where the collections are being housed.

FORM - 31

SURVEY AND INVENTORIES

RANGE:

Sl. No	Year	Title of survey, inventory activity	Completed	Ongoing	New	By PA	By other agency	Remarks
1	2	3	4	5	6	7	8	9

Completed : State date of completion of field work and the status of the report

Ongoing : State since when is it under operation & when is it expected to be completed.

New : State the date of commencement and duration.

By PA personnel: Will include collaboration or contractual arrangement. State the case as relevant.

Other agency : State the name of the agency.

Remarks : If specimen of plants /animals are being collected, state where the collection is being housed and authority. Any other useful information.

FORM - 32

THE MONITORING PROGRAMME

RANGE:

Sl. No	Year	Title of the programme	Date of initiation	Responsible agency	Technique	Status of collaboration and analysis of data	Remarks
1	2	3	4	5	6	7	8

Technique : PCQ, belt transect, line transect and plots, pugmarks etc. by the title of the technique.

Status of collaboration : Write only if applicable.

FORM - 33

ECO DEVELOPMENT PROGRAMME: TARGETS AND IMPLEMENTATION

RANGE: Year:

Sl. No	Nature of the programme	Sector (Central or State) or NGO sponsored	Target set		Achievements		Village (buffer or enclave)	Remarks
			Physical	Financial	Physical	Financial		
1	2	3	4	5	6	7	8	9

Nature of the programme : eg. pasture development, fodder plantations, establishing biogas units, livestock improvement, establishment and development of sericulture, revival of local skills such as handicraft, water harvesting systems, adult's education etc.

Village : Site where programme is being implemented – whether buffer or inside PA.

Remarks : State problems, state failures and reasons thereof, reasons for not attaining targets, for non-implementation or deviation etc. State whether it is on the right tracks in context of achievement of objectives.

Approval of Management Plan

PRINCIPAL CHIEF CONSERVATOR OF FORESTS
(WL) & CHIEF WILDLIFE WARDEN
KERALA

Forest Headquarters
"Vanalakshmi"
Thiruvanathapuram-14
Phone: 0471-2321610
E.Mail: cww.for@kerala.gov.in

No.WL4-2008/12 **Dated: 31.05.2021**

To

The Chief Conservator of Forests &
Field Director (Project Tiger)
Kottayam.

Sir,

Sub : Kerala Forest & Wildlife Department – Approval of Management Plan of Mathikettan Shola, Anamudi Shola and Pampadum Shola National Park - reg.

Ref: : Letter No. A1-490/2019/2184 dated 28.05.21 of CCF (WL) & FD (PT), Kottayam.

The draft Management Plan of Mathikettan Shola National Park, Anamudi Shola National Park and Pampadum Shola National Park was submitted to this office requesting for its approval. After examination of the said Management Plans by the Advisory Committee constituted for the purpose, observations of the Members of the Committee was communicated to the Chief Conservator of Forests & Field Director, Project Tiger, Kottayam and Wildlife Warden, Munnar for their incorporation in the Management Plan.

As per the reference, CCF (WL) & FD (PT), Kottayam has furnished the compliance of incorporating the suggestions and inputs given by the Advisory Committee in the draft Management Plan. In this context, the approval is hereby granted for the Management Plan of Mathikettan Shola National Park, Anamudi Shola National Park and Pampadum Shola National Park for the period from 2020-21 to 2029-30 subject to the following conditions.

1. The provision of the Forest (Conservation) Act, 1980 and directives issued from time to time by Hon'ble Supreme Court of India and also the guidelines issued by Government of India thereunder should be strictly adhered to while implementing the approved Management Plan.
2. All proposed works in this Management Plan shall be carried out as per the prescriptions.
3. For the deviations from the prescriptions of the Plan, if any, to be made only with the prior approval of the Chief Wildlife Warden.
4. The mid-term review of approved Plan should be carried out for appropriate mid-course alterations, if any, as required.

Yours faithfully,

Principal Chief Conservator of Forests (Wildlife) &
Chief Wildlife Warden

MANAGEMENT PLAN OF ANAMUDI SHOLA NATIONAL PARK 2020-21 TO 2029-30