

Chapter - II

Protection and Watershed Management Working Circle

60. General:

Forests of the region were managed for purposes of revenue in the past. Hence valuable trees like teak and rosewood were exploited from all the accessible areas, thereby reducing the availability good sized valuable trees in the forests. Shifting cultivation was also prevalent in the forest of these areas without any control. Biotic interference from the local people and from the settlers did a lot of damage to the forests. Overexploitation and adoption of improper management methods are also reasons for the degradation of the forests.

61. Description of area:

The luxuriant vegetation in Wayanad region was exploited unscientifically from the very early days. From the beginning of the 19th century some controls were insisted, but the unscientific approach, giving more importance to the revenue, could not make the natural forests free from exploitation and the resultant degradation. Biotic interferences from the settlers in and around the natural forests are always a threat to the forests of this region. Uncontrolled forest fires both in natural forests and plantations have resulted in the loss of fertile surface soil. During monsoons, soil loss due to surface erosion and damage to the stream and riverbanks are common. Scientific and systematic methods are to be adopted to conserve the fertile soil and also to protect the riverbanks. Proper soil and moisture conservation measures if taken, will guarantee the perennial water flow in the existing streams and rivers.

As per the study by KFRI, 62% of the natural forest in the State is in a degraded state. Accordingly it is assessed that 10000 ha of natural forest in North Wayanad division is in a degraded state (Reserve forest 7000, vested forest 3000). The degradation of the natural forests seriously affects the ecological balance thereby changing the species composition in the forests, including the micro flora and fauna. Preservation and improvement of the complex biodiversity is to be given utmost

priority. A large number of medicinal plants and other species of plants responsible for supply of Non-Wood Forest Produce have become scarce. Considering the above aspects the forest area including the plantations in the division are to be systematically managed in a scientific way.

The entire area of the division is divided into different six macro and 48 micro watersheds for systematic implementation of soil and moisture conservation measures.

62. Division of the area:

The forest area of North Wayanad Division including the plantations comes under this working circle. The total area of the working circle is 21428.62 ha. The range wise distribution of the area is given below.

Table No.29 Macro watersheds in the division

Watershed	Range	Area (ha)
1. Bavali	Begur	4234.08
2. Mananthavady I	Begur	6224.62
3. Mananthavady II	Mananthavady	1540.60
4. Mananthavady III	Peria	600.00
5. Panamaram	Mananthavady	1064.12
6. Peria	Peria	7765.20
Total		21428.62

The macro watersheds (Fig. 6) are given the names of the major rivers in the tract dealt with.

63. Objects of management:

1. Protection and improvement of the existing forests especially in the catchment areas to ensure perennial water supply.
2. Ensure soil and moisture conservation.
3. Ensure protection and conservation of biodiversity for sustained supply of NWFP and medicinal plant found in this area.

64. Methods of treatment:

To achieve the objects of management as mentioned above the entire area is divided into 6 macro watersheds. The macro watersheds are further divided into micro watersheds. Apart from the soil and moisture conservation activities, collection of NWFP, reeds and bamboo are permitted in the natural forests. The degraded forests

adjoining human habitation and susceptible to biotic interference are recommended for management under JFM after preparing Site Specific Plan for each area.

Division of macro and micro watershed areas:

65. Description:

Total extent of Watershed is 21,428.62 ha. The whole watershed areas are divided into 6 macro watersheds.

66. Distribution of Area under Macro Watersheds:

I. Bavali Watershed:

Area: 4234.08 ha.

North: Karnataka state boundary

East: Wayanad wildlife sanctuary

South: Mananthavady watershed

West: Kannur Division boundary

II. Mananthavady Watershed I:

Area: 6224.62 ha.

North: Bavali watershed

East: Kabini river

South: Mananthavady II watershed

West: Peria watershed and Mananthavady III watershed

III. Mananthavady Watershed II:

Area: 1540.60 ha.

North: Mananthavady I watershed

East: Panamaram watershed

South: South Wayanad Division boundary

West: Peria watershed and Mananthavady III watershed

IV. Mananthavady Watershed III:

Area: 600 ha.

North: Mananthavady I watershed

East: Mananthavady II watershed

South: Mananthavady II watershed

West: Peria watershed

V. Panamaram Watershed:

Area: 1064.12 ha.

North: Mananthavady watershed

East: Karnataka State boundary

South: South Wayanad Division

West: Peria watershed

VI. Peria Watershed:

Area: 7765.20 ha.

North: Kannur Division boundary

East: Mananthavady watershed

South: South Wayanad Division

West: Kannur Division boundary

67. Micro watersheds:

The macro watersheds comprise of smaller units called micro watersheds (Fig. 7) which can be taken as administrative units for the purpose of undertaking soil and moisture conservation activities. The names of such micro watersheds in respect of each Macro watersheds are given below:

I. Bavali macro watershed:

- | | | |
|-------------------|----------------|---------------|
| 1. Vellaravayal | 2. Tumbatta | 3. Attarvayal |
| 4. Edayurvayal | 5. Thirunelly | 6. Karimala |
| 7. Suryamudi | 8. Punchavayal | 9. Manikolli |
| 10. Chemmattimala | | |

II. Mananthavady I macro watershed:

- | | | | | |
|---------------|---------------|------------|--------------|------------|
| 1. Makki | 2. Talapoya | 3. Kambati | 4. Muthureri | 5. Kuyilam |
| 6. Puthiyodum | 7. Kottankara | | | |

III. Mananthavady II macro watershed:

- | | | |
|-------------------|-----------------|------------------|
| 1. Kammana | 2. Payangathiri | 3. Kunikara |
| 4. Thettamala | 5. Paleri | 6. Karimbil |
| 7. Kandakunnu | 8. Kunhome | 9. Niravilpuzha |
| 10. Manappadumala | 11. Chittamala | 12. Mangalassery |

IV. Mananthavady III macro watershed:

- | |
|----------|
| 1. Valat |
|----------|

V. Panamaram macro watershed:

- | | | |
|--------------|-----------------|----------------|
| 1. Nirvaram | 2. Kayakunnu | 3. Cherukattur |
| 4. Anjukunnu | 5. Arinjerimala | 6. Karakamala |
| 7. Kommayad | | |

VI. Peria macro watershed:

- | | | |
|------------------|---------------------|--------------|
| 1. Varayal | 2. Madiyur | 3. Palarambu |
| 4. Chandanathodu | 5. Kandankalarimala | 6. Pureri |
| 7. Panoth | 8. Attilathil | 9. Echipoyil |
| 10. Thondernad | 11. Vattoli | |

The Range Officer may identify more micro watersheds wherever necessary as and when required depending upon the availability of fund on a priority basis.

68. Identification of watersheds:

Treatment areas are to be selected at or before micro watersheds for the purpose of administrative convenience and technical feasibility. Normally, each micro watershed area takes its name from the minor river it drains into. Taking up Joint Forest Management in such selected areas can ensure the involvement of local community. The Implementing Officer, Range Officer with staff and representatives of the local community should perambulate such areas to identify the soil conservation structures to be made and their number and location. Site-specific plans (SSP) are to be prepared and got approved before the execution of any work. Before approval of SSP, the Divisional Forest Officer shall inspect the area personally and suggest suitable modifications, if required. It is vital to make a priority list of all the watersheds for treatment depending on the extent of degradation, urgency of conservation and availability of fund. The natural forests coming under each watershed has to be treated as per the prescriptions under this chapter based on the degree of degradation the site has undergone.

69. Methods of treatment:

Before one proceeds to treat a watershed it is absolutely essential to have a detailed knowledge of the following factors namely, precipitation, surface runoff, percolation, elevation, slope, vegetation, soil moisture, ground water status, nature of soil and it's organic contents, dependence of local people, extent of biotic

interference, land use pattern and a host of such other parameters, which become relevant in the prescription of appropriate methods for treatment of a watershed. Before treatment operations are undertaken it is necessary that site specific plans are prepared with the approval of the Divisional Forest Officer.

70. Treatment of natural forests:

In the project report of the World Bank aided Kerala Forestry Project, the natural forest areas to be dealt with are divided into Assisted Natural Regeneration (ANR), Restoration of Degraded Forests (RDF I and RDF II) and Restoration of Reeds, Rattans and Bamboos (RRB) based on the status of natural regeneration, crown density, occurrence of gaps, intensity of weeds, human interference, soil conditions and stage of succession, etc. The operations to be carried out in these areas are specified and aimed at the restoration of natural forests and improvement of the conditions of the plantations. This system of treatment of natural forests is the most appropriate one to achieve the objectives of management. The brief discussion of the activities to be undertaken in different types of treatment in natural forests is given in Table No. 30.

The operations to be carried out in the Kerala Forestry Project have already been approved by the Government. Accordingly Site-specific plans (SSP) are to be prepared after a thorough study of the field for each site.

Table No. 30 Details of treatments prescribed in KFP areas

Operations	ANR	RDF-I	RDF-II	RRB
1.Planting	100 seedlings /ha	550 seedlings /ha	1100 seedlings /ha	200 seedlings /ha
2.Weeding	To remove suppression of natural seedlings and to promote natural regeneration			
3.Tending of seedlings	a. Removal of climbers. b. Soil working around seedlings. c. Cutting back of top broken poles and saplings. d. Singling of coppice shoots. e. Tending of bamboo/ reed clumps.			
4.Soil and moisture conservation works	a. Gully plugging. b. Contour bunding. c. Contour trenching. d. Check dams.			
5. Manuring				
6.Fire protection				
7. Engaging Mazdoors to protect the area from biotic interference				

Details of areas under Kerala Forestry Project:

71. Criteria for site selection for ANR:

The forest area with the following features will be selected for Assisted Natural Regeneration under the project.

1. Moderately dense forests with average density between 0.4 and 0.7.
2. The areas which are important for a healthy catchment of water regime and expected to respond favourably to soil and water conservation measures.
3. Areas important for biodiversity but affected by degraded due to heavy loss of soil erosion, fires, past logging practices.
4. Areas supporting natural regeneration of an average of more than 600 seedlings/ ha but with struggling regeneration and occasional small gaps requiring sowing/planting.
5. Areas with minimum human interference in terms of collection of forest produce especially firewood, fodder, green manure etc.
6. Areas with weed growth limited to small gaps where removal of weeds could assist the better growth of existing seedlings/saplings.
7. Compact area of a minimum 50 ha will be selected.
8. Preferably away from human habitation.

The treatment plan will be prepared by the Range Officer under the guidance of Divisional Forest Officer and has to be approved by the Conservator of Forests before estimate is sanctioned. Areas selected under ANR in the division during 1991-2001 are given below.

Table No. 31 Prevailing ANR areas in North Wayanad division

Establishment	Range	Locality	Extent (ha)	Reserve
1999 – 2000	Peria	Chirakkal	129.00	Peria R.F.
2000 – 2001		Nallathanni	150.00	Peria R.F.
Total			79.00	

72. Prescriptions carried out:

1. Treatment maps developed for all the areas proposed and SSP prepared.
2. The treatment plans approved by the Conservator of Forests.

3. Soil moisture conservation treatments, tending, sowing and planting of seedlings are carried out as per the schedule proposed in Site Specific Plan.
It is too early to evaluate the success of the treatment.

73. Enriching the Degraded Forests:

The works of afforestation aiming to improve the growing stock of a locality are being attended under different schemes such as compensatory afforestation, heterogeneous mixed seeding, eco-restoration, plantations, social forestry and Kerala Forestry Project works. The works proposed in this paragraph are to be integrated with the activities under various such schemes. The works such as planting of trees, tending of natural seedlings, sowing etc, depending on the needs of site will be taken up along with other works. Preference should be given to soil binding species. Economic consideration plays secondary role.

Degraded forests include partially degraded natural forests (crown density <0.4) and totally degraded natural forests (crown density <0.1) in addition to failed plantations. The management of these forests are aimed at bio-diversity conservation, increasing productivity of forests and meeting the needs of the local people consistent with the objectives of enhancing the ecological value.

74. Method of treatment:

Depending on the degree of degradation, prescriptions for treatment of degraded forests are to be decided. Basically such areas can be classified into Regeneration of Degraded Forests-I and Regeneration of Degraded Forests –II (RDF-I & RDF- II).

a. Criteria for selection of area:

The following principles will be adopted for selection of areas to the treated under RDF I and RDF II.

Sl. No.	Criteria	RDFI	RDF II
1.	Crown density	0.1-0.4	0-0.1/failed plantation
2.	Regeneration status of seedlings/ha	300-600 established seedlings	Less than 300 NA for plantation
3.	Occurrence and size of gaps	Small, few	Large, many small gaps
4.	Weeds/grasses	Invasion not well established	Invasion of weeds/grasses well established
5.	Human interference	Moderate	Heavy

Sl. No.	Criteria	RDFI	RDF II
6.	Stages of succession	Pioneers and colonizers present. Succession on way and possible to assist by artificial, natural means.	Succession failed, requiring intensive interactions. NA for degraded plantation
7.	Soil types	Not much degraded worth responding to soil/ moisture conservation	Degraded requiring intensive site treatment for improvement of soil quality.

Choice of the species for planting in RDF1 and RDF2 areas should be based on site species matching; while in RDF1 area, the stage of succession and structure of communities will suggest the species for planting, preferably with faster growing pioneer species to cover the site, or other native species which the site could support. For degraded plantations, the species will be selected based on the purpose for which the area is earmarked. Indigenous species with NWFP value are to be preferred for natural forest areas.

The degraded forest areas taken up for treatment during 1989-2001 in the division are given in Table No. 32.

Table No. 32 Details of prevailing RDF areas in North Wayanad division

Year	Range	Locality	Plan	Extent (ha)	Reserve
1999 –00	Mananthavady	Kolippad	RDFII	50.00	Vested Forest
2000 –01	Peria	Arimala	RDF I	79.50	Peria R.F.
		Kunhome	RDFI	59.37	Peria R.F.
		Varayal	RDFI	26.20	Peria R.F.
Total				215.07	

75. Prescriptions carried out:

1. All the pre-requisites including treatment plans developed for the proposed areas and SSP were prepared and submitted.
2. The treatment plans approved by the Conservator of Forests.
3. Soil moisture conservation treatments, soil improvements, tending of regenerations and planting of site matching seedlings were carried out as per the schedule proposed in Site Specific Plan. It is too early to judge the performance of the project.

76. Soil and moisture conservation:

Various prescriptions connected with soil and moisture conservation are given below and the following structures are suggested for proper soil and moisture conservation.

1. Check dams.
2. Gully plugging.
3. Trenches and Mounds.
4. Construction of water storage structures.
5. Use of modified planting techniques like construction of inwards slopping platforms around the plants.

A. Check dams: The site for the construction of check dams in the proposed watersheds should be selected by the Range Officer concerned and got approved by the DFO. It is not advisable to go for big dams in the natural forests. The height of check dam should be the minimum possible with provision for outlets for the overflow of excess water. Construction of check dams will cause accumulation of water, which in turn will increase the water percolation capacity of the area. Care should be taken to see that the banks of the dams do not give way for flow of water during monsoon season.

B. Gully plugging: Soil erosion in slopy terrain devoid of grass cover begins with finger like rills, which join to form gully, thereby removing a large quantity of topsoil from the elevated places, transporting down stream. It is essential to locate the region of formation of such gullies. Masonry structures or dry rubble packing using jungle stones, available in the vicinity, are to be constructed at various locations in the gullies carefully selected by the Range Officer. The structures so constructed should help arrest loss of top soil and in conserving soil moisture in cost effective manner as per the extent guidelines in force for dimension of structures. Gully plugging structures conserve sufficient moisture on the uphill side of the structure thus improving soil moisture and even replenishing the ground water.

In order to construct better and useful structures for plugging the gullies, the following guidelines may be kept in mind:

- Big stones should be put in the bottom layers and also on top to prevent them being dislodged or carried away by the water current, by careful packing, bedding and wedging.
- After filling the foundation up to about 20cm depth and laying stones in the first layer, a step of 0.15 meters may be left on the down stream side without deviating from the curve.
- In the successive layers steps are left so as to reduce top width gradually.
- Thickness of apron packing should not be less than 0.45 meters and gully sides above the apron have to be protected with stone pitching to a height of at least 0.3 meters above the anticipated maximum water level to prevent side scours being formed by the falling water.
- The stone filling should go up to 0.3 to 0.6 meters into the stable portion of the gully side to prevent end cutting.
- In the center of the dam portion, sufficient water way is allowed to discharge the maximum run off from the catchment.
- The structure should form an arch with convex side facing the up hillside.
- Depending on steepness and run off volume, in general the top width should be kept to the minimum essential required (say 60 – 90 cm).

C. Trenches and Mounds: This method involves digging of trenches of desirable depth and width along the contours at appropriate intervals in open patches, in a staggered fashion. The soil thus scooped from the trenches is packed on the lower side of the trench thus creating a mound all along the trench. This method arrests the surface run off and the water that collects in the trench increases the water regime and the soil of the mound is bound by planting suitable tree species. This method can also be employed for binding the soil collected by the gully plugging structures.

D. Construction of water storage structures: These structures will help in collecting the run off water during monsoons. The outflow from various plugged gullies may be linked to a common pond with structure either existing naturally or created by scooping soil in natural landscape. These structures collect surface run off as well as silt that comes along with water.

E. Modified planting techniques: Planting may be done along the contour on slopes. Spacing may be decided based on the slope of the terrain. Modern techniques may be used in raising planting stock. When planting is done on the lower side of the trench make it sure that the root system of the seedling is in the compact soil. The inwards sloping platforms around the plants may be made to conserve moisture.

F. Planting on the riverbanks: Rivers, rivulets and streams run to full capacity during the monsoon periods causing damage to the exposed river/stream banks. Rate of such erosion is less in cases where riverbanks have thick soil cover. However, on these riverbanks planting of suitable species like bamboo, reeds, etc. is advisable in order to prevent further stream bank erosion and swallowing of rivers.

77. Record of watershed history:

The following control record may be maintained. The Divisional Forest Officer should bestow his personal attention and see that the records are kept up-to-date with correct postings.

The watershed history is maintained in respect of each micro watershed in the format prescribed below. This should be posted up-to-date.

- Name of micro-watershed with Range & Forest Stations
- Name of Reserve
- Gross area
- Net area
- Details about unproductive area
- Description of the boundary
- Aspect, slope, soil, elevation
- Description of the vegetation-trees, shrub, herbs and grasses
- Note on the condition of regeneration
- Detailed surveyed contour map
- Location map
- Treatment map

Works carried out in the past

- Year of working
- No. of check dams constructed

- No. of gullies plugged–total length, total structures
- No. of terraces, trench–mound made
- Storage structures
- Species planted, with extent
- Expenditure on structures
- Expenditure on planting and maintenance
- Any other matter of special interest

Annual record of all operations carried out in the working circle shall be maintained for each micro watershed. The cost of each item should be shown separately.

78. Biodiversity conservation:

The term Biodiversity was coined by Mr. Walter G. Rochn in 1985 and the word gained universal acceptability. Bio diversity is the variability among living organisms. The ecological complexity of biodiversity is found in the species and ecosystems. Bio diversity is an expression which describes the “Web-of-life” or the link between all living beings. It includes all forms of life, of animals and plants, both macro and the microscopic organisms. Biodiversity comprises the whole life on earth and is regarded at three different levels viz- genetic, species and ecosystem.

Biodiversity feed and cloth and provide housing, medicine and spiritual nourishment. The natural ecosystems of forests savannahs, pastures, deserts, tundras, rivers, lakes and the sea contain most of earth’s biodiversity. The ecological complexity of biodiversity is found in the species and ecosystems. It has consumption value in food, agriculture, medicine and industry. Biodiversity generally occurs in the face of land, realms of water and air and as in the biosphere.

India possess a great diversity in its natural forest ecosystem. Indian forest ranges from evergreen tropical rain forests in Andaman & Nicobar Island, the Western ghats and the Northeastern states to the dry alpine scrubs in the Himalaya to the north. Besides these two extremes India has Semi Evergreen Rain Forests, Deciduous Forests, Thorn Forests, Sub Tropical Pine Forests and Temperate Mountain Forests.

The State of Kerala falls in the Western ghats, one of the hot spots of Biodiversity in the world. Kerala is endowed with unique biological treasure of different species and genetic diversities.

Factors affecting Biodiversity:

The critical factors affecting Bio diversity are over exploitation, habitat loss, poaching and illegal trade, the invasion of exotics, fragmentation of habitat, large scale land slides, urbanisation, industrialisation and other related development activities. The rapid growth of population of each continent of the globe and exploitation of natural resources has adversely affected the physical and biological environment. Environmental pollution has taken place in a large scale in industrial and urban areas. The environmental changes pose a threat to survival of humans on earth.

The major threat biodiversity faces in the country is lack of awareness or knowledge about biodiversity. With the disappearance of biodiversity the society also loses the precious skills, knowledge of arts and crafts that depend upon the rich diverse nature of flora and fauna. Since time immemorial, man has been using the gifts of nature such as plants, trees, flowers, bees and butterflies not only for his survival but also for enriching and imagination. He has created a delightful world for himself by deriving inspiration from the colours and shape of nature's great variety and wonders.

The rich and highly diverse biological resources of our country are under constant threat and degradation due to a wide array of biotic interferences. A very conservative global biodiversity assessment comes to 130-140 lakhs of species of which only 17.5 lakh species are documented so far around the world.

Component of biological diversity are the key to the maintenance of global environment. There are more species on earth at the present geological time than in any other period, but the current rate of extinction of species is greater than in any time in the past. The loss of biodiversity is occurring at all levels; ecosystems and communities are being degraded and destroyed. It is estimated that the world is losing at least 2700 species per year in tropical rain forests alone. Major reasons for bio depletion are habitat loss, modification, destruction and fragmentation. Every year 3.5 million hectares of tropical forests are being cleared. To put in other words in every second one acre of tropical forests is being cleared.

The rich varied colourful and so enchanting diversity of organisms are of the most valuable possessions of the result of millions of millions of years of evolution and diversification of species.

The increasing human population threatens biodiversity. Some ecologists believe that more than 50% of the existing species will be lost in the next 100 years.

Human beings are at the top of the ecological pyramid. They act as predator because they are carnivore, feeding on a wide variety of plants and animals. Population growth in the world has increased consumption levels leading to depletion of resources. This has led to the degradation of land, water and air due to environmental pollution. With the explosive growth of human population, the life support system of earth is becoming threatened. The current decline in the world's biodiversity is largely the result of habitat destruction, unsustainable usage, over harvesting, pollution and inappropriate introduction of plants and animals. Although the full consequences of the loss of biodiversity are unknown, there are nevertheless compelling, scientific and ethical as well as economic reasons for conserving many lives on earth.

Now human beings have realized that their economic activities are threatening their survival on earth. The survival of human beings depends on the harmony with various elements of the environment, which are interdependent and inter connected. Hence an understanding of the components and process which takes place in the environment, the relationship between different abiotic and biotic components as well as assessment of resources and its use is essential. The more aware we are about the sanctity and wholeness of life in its various forms of expressions, the better equipped we are for life full of peace health and satisfaction.

The forests of Wayanad are very rich in wildlife so much so that the Expert Committee on Wildlife Conservation in India had recommended the declaration of Wayanad forests as wildlife sanctuary. 7998.315 ha of North Wayanad Division was constituted into a sanctuary vide G.O.MS 182/73/ dated 30.5.73. An Assistant Wildlife Preservation Officer was posted with Headquarters at Tholpetty for managing wildlife in North Wayanad.

During 1985 a separate Wildlife Division was formed with headquarters at Sultan Battery. The division was constituted by adding the sanctuary areas coming under North Wayanad Division and South Wayanad Division. A new range with headquarters at Tholpetty has been formed exclusively for managing wildlife and an Assistant Wildlife Warden posted. The Wayanad Wildlife Sanctuary is managed by the Wildlife Warden, Sultan Bathery and has Tholpetty, Sulthan Bathery, Kurchiat and Muthanga Range under its jurisdiction.

The common animals found in these forest tracts are:

Indian Elephant (*Elephas maximus*), Indian Bison (*Bos gaurus*), Sambhar (*Crevus unicolor*), Indian Wild Boar (*Sus scrofa*), Common Langur (*Presbytis entellus*), Nilgiri Langur (*Presbytis johni*), Lion-tailed Macaque (*Macaca silenus*), Tiger (*Panthera tigris*), Panther, Leopard (*Panthera pardus*), Jungle Cat (*Felis chaus*), Common mongoose (*Herpestes edwardsi*), Jackal (*Canis aureus*), Indian Fox (*Vulpus bengalensis*), Flying squirrel (*Petaurista, petaurista*), Malabar squirrel (*Ratufa indica*), Indian Porcupine (*Hystrix indica*), Barking Deer (*Muntacus muntjak*), Spotted Deer (*Axis axis*)

The Wayanad Wildlife sanctuary managed by an approved Management Plan prepared by Sri.Gopinathan Vallil, Wildlife Warden of Wayanad Wildlife Sanctuary. The plan advocates the measures listed below for the benefit of Wildlife.

- Habitat Improvement Works
- Improvement of food, cover and water
- Improvement of Gaps
- Improvement of pasture lands
- Removal of loranthus from Teak Plantation
- Regeneration of Natural Mixed Species in plantations
- Check dam construction
- Creating Water pools
- Maintenance of existing water source
- Soil Conservation measures
- Fire protection
- Control of grazing

Wildlife is no respect of administrative boundaries. This being so, the above mentioned measures may be implemented in North Wayanad Division for the benefit of Wildlife.

79. Schedule of Treatments:

The details of various treatments to be taken up in the forest areas of different watersheds during the plan period are furnished below.

Table No. 33 Schedule of treatments proposed in watersheds of North Wayanad

Year	Range	Watershed	Structures				Remarks
			Check dams (No.)	Gully plugging (M ³)	Staggered trenches (No.)	Contour bunds (RM)	
2002-03	Begur	Bavali	1	100	100	100	
		Mananthavady I	1	100	100	100	
	Mananthavady	Mananthavady II	1	100	100	100	
		Panamaram	1	100	100	100	
	Peria	Mananthavady III	1	100	100	100	
		Peria	1	100	100	100	
2003-04	Begur	Bavali	2	200	200	150	
		Mananthavady I	2	200	150	250	
	Mananthavady	Mananthavady II	1	100	100	100	
		Panamaram	1	100	100	100	
	Peria	Mananthavady III	1	100	100	100	
		Peria	3	300	300	300	
2004-05	Begur	Bavali	2	200	200	250	
		Mananthavady I	1	100	100	100	
	Mananthavady	Mananthavady II	1	100	100	100	
		Panamaram	1	100	100	100	
	Peria	Peria	3	250	300	100	
2005-06	Begur	Bavali	2	200	150	200	Maintenance of structures needed
		Mananthavady I	2	200	150	200	
	Mananthavady	Mananthavady II	1	100	100	100	
		Panamaram	1	100	100	100	
	Peria	Mananthavady III	1	100	100	100	
		Peria	3	250	300	100	
2006-07	Begur	Bavali	2	200	150	200	Maintenance of structures needed
		Mananthavady I	2	200	150	200	
	Mananthavady	Mananthavady II	1	100	100	100	
		Panamaram	1	100	100	100	
	Peria	Peria	3	250	300	200	

Year	Range	Watershed	Structures				Remarks
			Check dams (No.)	Gully plugging (M ³)	Staggered trenches (No.)	Contour bunds (RM)	
2007-08	Begur	Bavali	2	200	150	200	Maintenance of structures needed
		Mananthavady I	2	200	150	200	
	Mananthavady	Mananthavady II	1	100	100	100	
		Panamaram	1	100	100	100	
	Peria	Peria	3	250	300	200	
2008-09	Begur	Bavali	1	200	100	200	Maintenance of structures needed
		Mananthavady I	1	200	150	200	
	Mananthavady	Mananthavady II	1	100	100	100	
		Panamaram	1	100	100	100	
	Peria	Peria	3	250	300	100	
2009-10	Begur	Bavali	1	200	100	200	Maintenance of structures needed
		Mananthavady I	1	200	150	200	
	Mananthavady	Mananthavady II	1	75	75	100	
		Panamaram	1	75	75	100	
	Peria	Peria	3	250	200	100	
2010-11	Begur	Bavali	1	200	100	200	Maintenance of structures needed
		Mananthavady I	1	200	100	200	
	Mananthavady	Mananthavady II	1	75	75	100	
		Panamaram	1	75	75	100	
	Peria	Peria	3	250	200	100	
2011-12	Begur	Bavali	1	150	100	200	Maintenance of structures needed
		Mananthavady I	1	150	100	200	
	Mananthavady	Mananthavady II	1	75	75	100	
		Panamaram	1	75	75	100	
	Peria	Peria	2	200	200	100	