

TRAINING MODULE FOR DEPUTY RANGERS/ FORESTERS

Sr. No.	Course Theme
1.	Forest Protection and Law.
2.	Modern Plantation Technologies.
3.	Biodiversity Conservation.
4.	Computer Applications in Forestry.
5.	Ecological Census Techniques and documentation.
6.	Watershed Management.
7.	Joint Forest Management.
8.	Modern Techniques in Survey and Demarcation.
9	Importance of Non Timber Forest Produce

Duration of each Module-

- a. The duration of the course will be of two weeks. This will cursorily cover all the Modules with varying degree of emphasis. In two weeks Course only ten effective working days are available barring holidays. Taking into consideration 8 working hours, effectively 6 hours 30 minutes are available for training leaving 65 Lecture hours at disposal for effective training. All the 9 modules will be covered with varying emphasis depending upon the priority of the region and discretion of the Principal.
- b. Hours mean lecture and practical both as the case may be. Each lecture will consist of one hour and the practical will consist of 2 hours.
- c. Emphasis will be laid on the examples and case studies from the region concerned.

1. FOREST PROTECTION AND LAW

Hours 12

A. FOREST PROTECTION

1. General Consideration

- 1.1 The place of forest protection in forestry.
- 1.2 Classification of injurious agencies.
 - 1.2.1 Animals.
 - 1.2.2 Insects/Pests.

- 1.2.3 Plants.
- 1.2.4 Atmospheric agencies.

2. Prevention – its importance.

B. FOREST LAW

1. Legal concepts – General Act & Special Act

2. Forest Regulation of the State concerned

- 2.1 Definition of Forest Produce, Forest Officer, Cattle, River etc.
- 2.2 Constitution of Reserve Forests/Protected forests/Village Forests/Anchal Forests/Panchayat forests etc.
- 2.3 Protection of forests.
- 2.4 General protection of forests and forest produce.
- 2.5 Penalties and procedure for breach of Forest Rules –
Compounding of forest offences.

3. Powers of Forest Officers

- 3.1 Offence reports/Investigation/Custody of seized Produce.
- 3.2 Search & seizure procedure.
- 3.3 Eviction.
- 3.4 Arrest.

4. Rules Regarding Forests

- 4.1 Reserved trees.
- 4.2 Trade permit.
- 4.3 Free grant.
- 4.4 Quarrying of stones etc.
- 4.5 Tree protection act.

5. Transit Rules

- 5.1 Issue of permit.
- 5.2 Certificate of origin.
- 5.3 Challan.
- 5.4 Functions of Revenue stations (obligatory Check posts).
- 5.5 Control over saw mills and sawpits.
- 5.6 Registration of Traders property marks.
- 5.7 Control over Forest Produce from private forests etc.
- 5.8 Marking hammers

6. Drift Timber Rules

- 6.1 Categories of timber.
- 6.2 Notice to claimants.
- 6.3 Drift Mohals (for North-Eastern States only).

7. Land laws relating to forests, other miscellaneous rules and regulations.

8. Forest Conservation Act, 1980, procedure for preparation of report.

9. Workmen's compensation Act, 1923 (amended in 2000).

10. Provisions of Criminal Procedure Code related to field execution of duties.
11. Indian Penal Code relevant sections
12. Specific case studies and Court formalities
13. Public premises Act Vis a Vis eviction of Encroachments

2. MODERN PLANTATION TECHNOLOGIES

Hours 8

1. **Plantation Planning**
 - 1.1 Survey & laying out of plot.
 - 1.2 Preparation of treatment map.

2. **Nursery techniques for 15 ecologically and economically important tree species**
 - 2.1 Planning and selection of site, fencing.
 - 2.2 Preparation of beds, polypot & sheds.
 - 2.3 Selection, and marking of plus trees.
 - 2.4 Seeding time, seed bed, weight, seed.
 - 2.5 Procurement, seed preservation.
 - 2.6 Seed treatment and sowing.
 - 2.7 Pricking out in permanent beds and
 - 2.8 Common nursery diseases, symptoms, Casual organism, control and cure by Application of insecticides and fungicides.
 - 2.9 Application of manures and fertilizers.
 - 2.10 Weeding, cleaning, watering & manipulation of shade.
 - 2.11 Hardening.
 - 2.12 Root pruning.
 - 2.13 Gradation.
 - 2.14 Root/shoot cuttings.
 - 2.15 Grafting/layering & budding.
 - 2.16 Bamboo and its propagation through seeds, Rhizome, nodes and vegetative means.
 - 2.17 Clonal Propagation/ Root Trainers/ Modern Techniques.

3. **Plantation techniques**
 - 3.1 Site cleaning, burning, Contouring, stacking, digging of pits and pit filling
 - 3.2 Fencing, fire lines and inspection paths
 - 3.3 Sowing, dibbing, planting of cuttings and stump transplanting
 - 3.4 Application of weedicides, Pesticides, manure and Fertilizers.
 - 3.5 Weeding, cleaning, gap filling and irrigation
 - 3.6 Plantation techniques of some important species in the state.

4. **Cultural operations**
 - 4.1 Tending-weeding, cleaning, climber cutting, pruning, cutting back, pollarding, Girding etc.
 - 4.2 Thinning

5. **Genetic Tree Improvement**
 - 5.1 Modern Nursery Techniques

- 5.2 Clonal Seed Orchards and Seedling Orchards
- 5.3 Modern Trends in Irrigated Plantation
- 5.4 Planting Models: Forestry, Agro forestry and Silvi-pastoral etc. Operations -Ecological Perspective
- 5.5 Hormone and stimulants for rooting
- 5.6 Green house and mist chamber design and management.

6. Plantation Records

- 6.1 Site Map and Site Photographs
 - 6.1.1 Treatment Map
- 6.2 Plantation Estimations
- 6.3 Records of various operations
- 6.4 Expenditure incurred
- 6.5 Monitoring and Evaluation Formats, Inspection Notes etc
- 6.6 Record of Ecological Observations
- 6.7 Meticulous recording of Compartment Histories

PRACTICALS, FIELD VISITS AND VISIT TO VARIOUS ORGANISATIONS IN AFTERNOONS

3. BIODIVERSITY CONSERVATION

Hours 5

Part I

- Biodiversity Definition.
- Biodiversity and wildlife values.
- Bio-geographic Zones of India.
- Protected Area Network in the country.
- An overview of endemism in flora and fauna.

Part II

- Mega fauna of India; occurrence, distribution, present status and elementary ecology concerning Large carnivores, Asian Elephant, Rhinoceros, Musk deer, Gaur, Hoolock Gibbon, Nilgiri tahr.
- Avifauna in India.
- Wetland Conservation in India (with special reference to the region concerned).
- Biosphere reserves, with special reference to India.

Part III

- Wildlife Management Concepts.
- Habitat Elements.
- Habitat Assessment and Management.
- Home range and territory.
- National Parks & Sanctuaries in India with special emphasis on specific region.
- The concept of Zonation.
- Man-animal conflict.
- Conflict Resolution.

Part IV

- *In-situ* and *ex-situ* conservation/ Zoo Management.
- National Institutions involved in conservation.
- Basics of Ecotourism.

Part V Practicals

- Sampling Techniques for enumeration of plants.

Part VI Salient Features of Wildlife (Protection) Act, 1972 (amended 1991)

4. COMPUTER APPLICATIONS IN FORESTRY

Hours 4

1. **Introduction to Computers**

2. **Operating Systems**

Introduction to operating Systems
Introduction WINDOWS 98 and 2000

3. **Word Processing:**

Introduction to Word Processing
M.S. WORD: Edit, Save, Print, Tables, Spell Checks,
Advanced Features, Exercises, Practice

4. **SPREAD SHEET:**

Introduction to Electronic Spread Sheet
M.S. EXCEL: Menus, Graphs, Reports and Printing of Spread sheets
Forestry Applications Practice and Self learning package.

5. ECOLOGICAL CENSUS TECHNIQUES AND DOCUMENTATION

Hours 4

Ecological Census Techniques

- Data collection for Ecological Parameters.
- Wildlife Census
- Field-Based methods for assessing habitat elements.
- Conducting regeneration surveys.

Documentation

- Documentation of Filed Observations.
- Writing and maintaining Compartment Histories and Descriptions.
- Developing Data Formats.

6. WATERSHED MANAGEMENT

Hours 9

1. **Land Use Assessment**
 - Introduction to Management by Watershed.
 - Methods of Land use Assessment.
 - Scanning Secondary Information.
 - Identify key elements.
2. **Watershed Data collection Techniques**
3. **Waste land Management**
 - 3.1 Introduction.
 - 3.2 Classification.
 - 3.3 Identification and Reclamation of saline-alkaline soil.
 - 3.2 Management of water logged areas.
 - 3.3 Identification of various types of waste lands.
 - 3.4 Development of such Waste lands and techniques adopted.
4. **Range Management:**
 - Principles and methods of grassland management.
5. **Wetland Management and Conservation**
6. **Case Studies-**
7. **Watershed Management Planning Process:
(Through Case Studies and standards prescribed)**
 - 7.1 Unit of planning.
 - 7.2 Codification of watersheds, sub-watershed, micro-catchments.
 - 7.3 Demarcation of priority watershed.
 - 7.3.1 Soil survey Techniques.
 - 7.3.2 Collection of Socio-economic data.
 - 7.3.3 Agronomic practices in Soil conservation.
 - Review of Contour farming Practice.
 - Cover crops and legumes.
 - Strip cropping.
 - New trends in Composting and Bio-fertilizers.
 - Mixed and rotational cropping.
 - Green manuring and mulch farming.
 - Terracing and dry land farming.
 - 7.4 Forestry Practices in Soil conservation:
 - 7.2.1 Techniques to stabilise debris and land slide.
 - 7.2.2 Log Wood check dam.
 - 7.2.3 Plantation, ground/ land development.
 - 7.5 Prevention of Watersheds from erosion and pollution.

VISIT TO VARIOUS ORGANISATION AND FIELD VISITS
Field visits will be on Regional Basis

7. JOINT FOREST MANAGEMENT

Hours 8

SECTION 'A'

1. **Community Forestry:**
 - 1.1 Role of Forestry in Rural Development
 - 1.2 Environmental pollution and recreation
 - 1.3 Perspective of Community Development for Frontline Staff
2. **Agro-Forestry:**
 - 2.1 Its need and scope on and around agricultural lands.
 - 2.2 Role in rural economy and its effect on agricultural practices
 - 2.3 Agro Forestry Models with Economic Analysis
 - 2.5 Role of forest department.
3. **Eco-tourism**
 - 3.1 **Ecotourism -The concept**
 - 3.1.1 Definition
 - 3.1.2 Action Plan
 - 3.1.3 Critical Review
 - 3.2 **Ecotourism Policies and Guidelines**
 - 3.3 **Perspectives**
 - 3.3.1 Ecotourism Markets
 - 3.3.2 Impacts
 - 3.3.3 Sustainable Development
 - 3.3.4 Sustainable Design
 - 3.4 **Case Studies**
 - 3.4.1 Sikkim Ecotourism Project
 - 3.4.2 Jungle Lodges and Resorts
 - 3.4.3 Periyar tiger Reserve
 - 3.4.4 Corbett Tiger Reserves
4. **Recreation Forestry and Landscaping:**
 - 4.1 Scope and need of Recreation Forestry
5. **Case Studies**

related to Joint Forest Management
6. **Extension and Publicity:**
 - 6.1 Role and mode of publicity of conservation issues
 - 6.2 Modes of Publicity
 - 6.2.1 Direct contact with the people
 - 6.2.2 Using mass publicity media-radio, television, posters etc.
 - 6.3 Establishing Demonstration and Interpretation centers
 - 6.4 Infrastructural needs for training, workshops, seminars and exhibitions.
 - 6.5 Various means of Incentives.
 - 6.6 Conducting Competitions and Contests for awareness generation at grass root level.
7. Endangered species and medicinal plants conservation through people's participation with special emphasis on raising, cultivation and sustainable utilization.

8. **Tribal Development Schemes and their execution**
9. **Social Forestry, Future prospects, Forest Management.**
10. **Values and Ethics in Profession**
 - 10.1 Stress Free Living
 - 10.2 Self Management Leadership
 - 10.3 Self Management Quality of Life
 - 10.4 Positive Approach to Total Health (PATH)
 - 10.5 Stress Management and Right Thinking (SMART)

PRACTICALS

- Conduction of Participatory Rural Appraisal & RRA exercises in villages.
- Techniques of seeking maximum participation of local people

VISIT TO VARIOUS ORGANISATION AND FIELD VISITS

8. MODERN TECHNIQUES IN SURVEY AND DEMARCATION

THEORY

Hours 5

- Introduction to Mapping and Cartography Indian context.
- Introduction to Remote Sensing Data Products.
- Introduction to Geographical Information System.

PRACTICALS

- Map Reading.
- Use of wedge prisms.
- Modern Prismatic Compass.
- Survey techniques of large and small landscapes.
- Surveying of un-surveyed elements.

9. Importance of Non Timber Forest Produce

Hours 10

a. General Botany

- i. Field Identification of Forestry Species
- ii. Botanical Nomenclature and Type Concept
- iii. Herbarium Methodology
- iv. Role of Herbariums in Biodiversity Conservation
- v. Development of Arboretum and Botanical Garden

b. Non Timber Forest Produce

1. Introduction:

- 1.1 Non-wood forest products of India and their importance in rural and industrial economy of the country.

2. **Fibers and Flosses:**
 - 2.1 Fiber yielding plants
 - 2.2 Importance of fiber yielding plants.

3. **Grasses, Bamboos and canes:**
 - 3.1 Various grasses and their uses in village and cottage industries.
 - 3.2 Bamboos—their distribution, harvesting and uses, raw material scenario in bamboos.
 - 3.3 Canes-their distribution, harvesting, processing and uses.

4. **Essential Oils and their methods of extraction:**
Essential oil bearing plants of commercial importance.

5. **Oil Seeds:**
 - 5.1 Important oil seeds obtained from forests
 - 5.2 Methods of collection, processing, packing and storage.
6. **Gums, Resin and Oleoresin:**
 - 6.1 Commercial gums, resins and their oleo-resin and their economical importance.
 - 6.2 Methods of tapping of important gums, resin and oleo-resin.
 - 6.3 Processing, grading, packing and storage of gums, tans and dyes.
 - 6.4 Important dyes.

7. **Edible plants, nuts and spices**

8. **Rubber:**Cultivation, and tapping.
 - 8.1 Processing
 - 8.2 Uses of rubber

9. **Charcoal:**
 - 9.1 Various types of kiln used for manufacture of charcoal.
 - 9.2 Charcoal dust briquettes

10. **Miscellaneous products: Determination of yield extraction, procedure, storage marketing**
 - 10.1 Bidi leaves
 - 10.2 Katha
 - 10.3 Products of destructive distillation of wood
 - 10.4 leaf fodder
 - 10.5 Animal products
 - 10.6 Mahua
 - 10.7 Chironji
 - 10.8 Achar
 - 10.9 Dhak Leaves
 - 10.10 Pine Needles
 - 10.11 Phooljharoo

11. **Important Dyes**

- c. **Medicinal Plants in India**

1. **Conservation of Medicinal Plants – The Current Scenario**
 - 1.1 Perspective, need and scope.
 - 1.2 Traditional use of Medicinal Plants (ethno Medicines)
 - 1.3 Medicinal Systems and its evolution
 - 1.4 Institutions and agencies involved
 - 1.5 National Policy on Trade, Use and Conservation of important drugs of commercial value

2. **Conservation strategy**
 - 1.1 In-situ and ex-situ conservation
 - 1.2 Nursery Techniques
 - 1.3 Methods of cultivation, harvesting, processing and grading
 - 1.4 Research and Training
 - 1.5 Database generating

3. **Identification, Survey/Assessment Techniques, and database generation**

TRAINING MODULE FOR FOREST GUARDS

Sr. No	Course Theme
1.	Forest Protection and Law
2.	Modern Plantation Technologies
3.	Joint Forest Management
4.	Watershed Management
5.	Ecological Census Techniques
6.	Wildlife Management
7.	Importance of Non Timber Forest Produce

Duration of each Module-

- a. The duration of the course will be of two weeks. This will cursorily cover all the Modules with varying degree of emphasis. In two weeks Course only ten effective working days are available barring holidays. Taking into consideration 8 working hours, effectively 6 hours 30 minutes are available for training leaving 65 Lecture hours at disposal for effective training. All the 7 modules will be covered with varying emphasis depending upon the priority of the region and discretion of the Principal.
- b. Hours mean lecture and practical both as the case may be. Each lecture will consist of one hour and the practical will consist of 2 hours.
- c. Emphasis will be laid on the examples and case studies from the region concerned.

1. FOREST PROTECTION AND LAW

Hours :12

B. FOREST PROTECTION

1. General Consideration

The place of forest protection in forestry.

Recording Observations of injurious agencies

- Animals
- Insects/Pests
- Plants
- Atmospheric agencies

B. FOREST LAW

1. **Legal concepts** – General Act & Special Act
2. **Forest Regulation of the State concerned**
 - 2.1 Definition of Forest Produce, Forest Officer, Cattle, River etc.
 - 2.2 Constitution of Reserve Forests/Protected forests/Village Forests/Anchal Forests/Panachayat forests etc.
 - 2.3 Protection of forests
 - 2.4 General protection of forests and forest produce
 - 2.5 Penalties and procedure for breach of Forest Rules –Compounding of forest offences.
 - 2.6 Recovery of money due to Government
3. **Issuing Offence Report and maintenance of records**
 - 3.1 Custody of seized Produce
 - 3.2 Search & seizure procedure
 - 3.3 Eviction
 - 3.4 Arrest
4. **Rules Regarding Forests**
 - 1.1 Reserved trees
 - 1.2 Trade permit
 - 1.3 Free grant
 - 1.4 Quarrying of stones etc.
 - 1.5 Tree protection act.
5. **Transit Rules**
 - 5.1 Issue of permit
 - 5.2 Certificate of origin
 - 5.3 Challan
 - 5.4 Functions of Revenue stations (obligatory Check posts)
 - 5.5 Control over saw mills and sawpits
 - 5.6 Registration of Traders property marks
 - 5.7 Control over Forest Produce from private forests etc.
 - 5.8 Marking hammers
6. Land laws in relation to forests, other miscellaneous rules and regulations
7. Forest Conservation Act, 1980 procedure for preparation of report.
8. Labour laws : Salient features
9. Provisions of Criminal Procedure Code, related to field execution of duties.
10. Indian Penal Code relevant sections
11. Eviction of Forest Encroachments—related Acts.

2. MODERN PLANTATION TECHNOLOGIES

Hours: 12

1. **Plantation Planning**
 - 1.1 Survey & laying out of plot
 - 1.2 Preparation of treatment map
2. **Nursery**
 - 2.1 Planning and selection of site, fencing
 - 2.2 Preparation of beds, polypot & sheds
 - 2.3 Selection, and marking of plus trees
 - 2.4 Seeding time, seed bed, weight, seed
 - 2.5 Procurement, seed preservation
 - 2.6 Seed treatment and sowing
 - 2.7 Pricking out in permanent beds and Polypots
 - 2.9 Common nursery diseases, symptoms, Casual organism, control and cure by Application of insecticides and fungicides
 - 2.4 Application of manures and fertilizers
 - 2.5 Weeding, cleaning, watering & manipulation of shade
 - 2.6 Hardening
 - 2.7 Root pruning
 - 2.8 Gradation
 - 2.9 Root/shoot cuttings
 - 2.10 Grafting/layering budding
 - 2.11 Bamboo and its propagation through seeds, Rhizome, nodes and vegetative means.
3. **Plantation techniques**
 - 3.1 Site cleaning, burning, Contouring, stacking, digging of pits and pit filling
 - 3.2 Fencing, fire lines and inspection paths
 - 3.3 Sowing, dibbing, planting of cuttings and stump transplanting
 - 3.4 Application of weedicides, Pesticides, manure and Fertilizers.
 - 3.5 Weeding, cleaning, gap filling and irrigation
 - 3.6 Plantation techniques of some important species in the state.
4. **Cultural operations**
 - 4.1 Tending-weeding, cleaning, climber cutting, pruning, cutting back, pollarding Girding etc.
 - 4.2 Thinning
5. **Genetic Tree Improvement**
 - 5.1 Modern Nursery Techniques
 - 5.2 Clonal Seed Orchards and Seedling Orchards
 - 5.3 Modern Trends in Irrigated Plantation
 - 5.4 Planting Models: Forestry, Agro forestry and Silvi-pastoral etc. Operations - Ecological Perspective
 - 5.5 Hormone and stimulants for rooting
 - 5.6 Green house and mist chamber design and management.
6. **Plantation Records**

- 6.1 Site Map and Site Photographs
 - 6.2 Plantation Estimations
 - 6.3 Records of various operations
 - 6.4 Meticulous recording of Compartment Histories
7. Strategy for maintaining and monitoring old plantations

PRACTICALS, FIELD VISITS AND VISIT TO VARIOUS ORGANISATIONS IN AFTERNOONS

3. JOINT FOREST MANAGEMENT

Hours 10

SECTION 'A'

1. **Community Forestry:**
 - 1.1 Role of Forestry in Rural Development
 - 1.2 Environmental pollution and recreation
 - 1.3 Perspective of Community Development for Frontline Staff

2. **Agro-Forestry:**
 - 2.1 Its need and scope on and around agricultural lands.
 - 2.2 Role in rural economy and its effect on agricultural practices
 - 2.3 Agro Forestry Models.
 - 2.5 Role of forest department.

3. **Eco-tourism**
 - 3.1 **Ecotourism -The concept**
 - 3.1.1 Definition.
 - 3.1.2 Action Plan.
 - 3.1.3 Critical Review.

 - 3.2 **Perspectives**
 - 3.2.1 Ecotourism Markets.
 - 3.2.2 Impacts.
 - 3.2.3 Sustainable Development.

 - 3.3 **Case Studies**
 - 3.3.1 Ecotourism Projects.
 - 3.3.2 Jungle Lodges and Resorts.
 - 3.3.3 Tiger Reserve.
 - 3.3.4 Tiger Reserves.

4. **Recreation Forestry and Landscaping:**
 - 4.1 Scope and need of Recreation Forestry.

5. **Case Studies**
related to Joint Forest Management.

6. **Extension and Publicity:**

- 6.1 Role and mode of publicity of conservation issues.
- 6.2 Modes of Publicity.
 - 6.2.1 Direct contact with the people.
 - 6.2.2 Using mass publicity media-radio, television, posters etc.
- 6.3 Establishing Demonstration and Interpretation centers.
- 6.4 Infrastructural needs for training, workshops, seminars and exhibitions.
- 6.5 Various means of Incentives.
- 6.6 Conducting Competitions and Contests for awareness generation at grass root level.

7. **Social Forestry**

8. **Values and Ethics in Profession**

- 8.1 Stress Free Living.
- 8.2 Self Management Leadership.
- 8.3 Self Management Quality of Life.
- 8.4 Positive Approach to Total Health (PATH).
- 8.5 Stress Management and Right Thinking (SMART).

PRACTICALS

- Conduction of PRA AND RRA exercises in villages.
- Techniques of seeking maximum participation of local people.

VISIT TO VARIOUS ORGANISATION AND FIELD VISITS

4. WATERSHED MANAGEMENT

Hours 10

1. **Land Use Assessment**

- Introduction to Management by Watershed.
- Methods of Land use Assessment.

2. **Watershed Data collection Techniques**

3. **Waste land Management**

- 3.1 Introduction.
- 3.2 Classification.
- 3.4 Identification and Reclamation of saline-alkaline soil.
- 3.5 Management of water logged areas.
- 3.6 Identification of various types of waste lands.
- 3.7 Development of such Waste lands and techniques adopted.

4. **Range Management:**

Principles and methods of grassland management.

5. **Wetland Management and Conservation**

6. **Case Studies**

7. **Aspects of Watershed Management:**

(Through Case Studies and standards prescribed)

- 7.1 Unit of planning.
- 7.2 Demarcation of priority watershed.
- 7.3 Review of Contour farming Practice.
- 7.4 Cover crops and legumes.
- 7.3 Strip cropping.
- 7.4 New trends in Composting and Bio Fertilizers.
- 7.5 Mixed and rotational cropping.
- 7.6 Green manuring and mulch farming.
- 7.7 Terracing and dry land farming.
- 7.8 Forestry Practices in Soil conservation:
 - 7.10.1 Techniques to stabilize debris and land slides.
 - 7.10.2 Log Wood check dam.
 - 7.10.3 Plantation, ground/ land development
- 7.11 Prevention of Watersheds from erosion and pollution

VISIT TO VARIOUS ORGANISATION AND FIELD VISITS IN THE REGION

5. ECOLOGICAL CENSUS TECHNIQUES AND DOCUMENTATION

Hours 5

Ecological Census Techniques

- Ecology and General concepts.
- Environmental conservation.
- Habitat and its elements.
- Data collection for Ecological Parameters.
- Executing Wildlife Census Operation.
- Field-Based methods for assessing habitat elements.
- Executing regeneration surveys.

Documentation

- Documentation of Filed Observations.
- Writing and maintaining Compartment histories and descriptions.

6. WILDLIFE MANAGEMENT

Hours 6

Part I

- Definition.
- Wildlife values.

- Bio-geographic Zones of India.
- Protected Area Network in the country.

Part II

- Ecology of large Herbivores and Carnivores.
- Avifauna in the region.
- Biosphere reserves.
(with special reference to the respective regions)

Part III

- Wildlife Management Concepts.
- Habitat Elements.
- Habitat Assessment and Management.
- Home range and territory.
- Man-animal conflict.
- Conflict Resolution.

Part IV

- *In-situ* and *ex-situ* conservation.
- Conservation breeding and Reintroduction.
- Basics of Ecotourism.

Part V Practicals

Ecological Census Techniques:

- Sampling Techniques for enumeration of plants.
- Concepts of Execution of census for other animals.

Part VI Salient Features of Wildlife (Protection) Act, 1972 (amended 2002)

7. Importance of Non Timber Forest Produce

Hours 10

a. General Botany

- i. Field Identification of Forestry Species
- ii. Botanical Nomenclature and Type Concept
- iii. Herbarium Methodology
- iv. Role of Herbariums in Biodiversity Conservation
- v. Development of Arboretum and Botanical Garden

b. Non Timber Forest Produce

1. Introduction:

- 1.1 Non-wood forest products of India and their importance in rural and industrial economy of the country.
- 1.2 Survey of non-wood forest products
2. **Fibers and Flosses:**
 - 2.1 Fiber yielding plants
 - 2.2 Methods of cultivation of important fiber yielding plants.
3. **Grasses, Bamboos and canes:**
 - 3.1 Various grasses and their uses in village and cottage industries.
 - 3.2 Bamboos—their distribution, harvesting and uses, raw material scenario in bamboos.
 - 3.3 Canes—their distribution, harvesting, processing and uses.
4. **Essential Oils and their methods of extraction:**
Essential oil bearing plants of commercial importance, methods of their cultivation and exploitation.
5. **Oil Seeds:**
 - 5.1 Important oil seeds obtained from forests
 - 5.2 Methods of collection, processing, packing and storage.
6. **Gums, Resin and Oleoresin:**
 - 6.1 Commercial gums, resins and their oleo-resin and their economical importance.
 - 6.2 Methods of tapping of important gums, resin and oleo-resin.
 - 6.3 Processing, grading, packing and storage of gums, tans and dyes.
 - 6.4 Vegetable tanning materials obtained from forests, their extraction, processing, handling and storage.
 - 6.5 Important dyes.
7. **Edible plants, nuts and spices**
8. **Rubber:**
 - 8.1 Cultivation, and tapping.
 - 8.2 Processing
 - 8.3 Uses of rubber
9. **Charcoal:**
 - 9.1 Various types of kiln used for manufacture of charcoal.
 - 9.2 Charcoal dust briquettes
10. **Miscellaneous products: Determination of yield extraction, procedure, storage marketing**
 - 7.1 Bidi leaves
 - 7.2 Katha
 - 7.3 Products of destructive distillation of wood
 - 7.4 leaf fodder
 - 7.5 Animal products
 - 7.6 Mahua
 - 7.7 Chironji
 - 7.8 Achar
 - 7.9 Dhak Leaves
 - 7.10 Pine Needles

7.11 Phooljharoo

11. **Important Dyes**

c. Medicinal Plants in India

1. **Conservation of Medicinal Plants – The Current Scenario**

1.1 Perspective, need and scope.

1.2 Traditional use of Medicinal Plants (ethno Medicines)

1.3 Medicinal Systems and its evolution

1.4 Institutions and agencies involved

1.5 National Policy on Trade, Use and Conservation of important drugs of commercial value

2. **Conservation strategy**

2.1 In-situ and ex-situ conservation

2.2 Nursery Techniques

2.3 Methods of cultivation, harvesting, processing and grading

2.4 Research and Training

2.5 Database generating

3. **Identification, Survey/Assessment Techniques, and database generation**