

Management of Forests in India for Biological Diversity and Forest Productivity A New Perspective

WII-USDA Forest Service Collaborative Project
Grant No. FG-In-780 (In-FS-120)



Volume III

Anaimalai Conservation Area (ACA)

Sajeev T.K.
Sanjay K. Srivastava
Martin G. Raphael
Sugato Dutt
Ramchandran N.K.
Praveen C. Tyagi



भारतीय वन्यजीव संस्थान
Wildlife Institute of India



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Project Overview

Background

The Wildlife Institute of India-U.S. Forest Service Collaborative Project entitled “Management of Forests for Biological Diversity and Forest Productivity – A New Perspective” was conceived in 1992 and formally approved by the Government of India in 1995. An Memorandum of Understanding was signed between the parties for this project under the Indo-US Scientific Collaboration on Science and Technology on November 24, 1995 with a sanctioned grant of Rs. 13,455,000 (USIF). The project evolved from the earlier collaboration of the US Forest Service (USFS) and the Wildlife Institute of India (WII) on a project in the Satpura Hills of Central India.

The project is first of its kind in India to address the primary mandate of forest managers in the country to sustain forest biodiversity. The National Forest Policy (NFP) of 1988 by recognizing the maintenance of biological diversity in forests as the principle mandate was materially different than the previous NFP passed in 1952. It is obvious that the traditional forest management approach had to undergo a major shift in emphasis and strategies. The shift in traditional training for budding foresters needed to be inseparable from changes that must happen in the field. Both were under review in India at the time of project initiation. This project was, thus, expected to play a significant role in demonstrating the integration of science and management in a planning process that establishes the complementary roles of protected areas and the large surrounding landscapes of managed forests in maintaining forest-based biological activity.

In view of the above, the principal aim of the project was to demonstrate an approach to achieving integration of concerns in India for biological diversity, forest based products, and their sustained flow in support of technological, economic and social benefits to urban and rural sector lifestyles. To accomplish this, the project set forth the following six objectives that addressed ecological assessment in “conservation areas” that included relatively undisturbed forest ecosystems, managed forests with current forestry interventions under a variety of harvest systems, and intervening matrix landscapes that support subsistence and related market based rural economies.

Project Objectives

- Assess, document, and map the kinds, extent and distribution of plant and animal diversity in selected “conservation areas” through rapid survey methods.
- Use existing status and habitat relationships information to set up baseline habitat relationships information system.
- From stand-to landscape-level perspectives, evaluate the impact of existing forestry practices and use of forest-based resources by local people, including methods of harvests and collection, fires, operation of varied concessions and rights on micro habitat elements, key habitats, species, communities, the overall forest productivity and diversity.
- Rapidly assess the social and economic systems of surrounding villages in terms of varied land use and forest resource dependency, including raising and grazing of domestic livestock, other vocations, skills, economy, and markets. These will be seen in relationship to forest systems. Threats to ecological harmony and economical status of people will be documented.
- Use modern ecological concepts to develop practical management tools and practices for bringing about harmony within and between forest and village systems through sustainable land use practices that make social and economic sense. Document problems and threat mitigation prescriptions, and develop site specific field guides to management.
- Conduct workshops and seminars to share experiences, disseminate knowledge, and begin the process of training scientists and managers.

Project Sites

The project was field based at four conservation areas (CA) that covered some 15,500 sq km of forested and nonforested matrix areas representing a variety of biogeographic patterns in wild plant and animal

communities, forestry practices, ethnic human societies and their forest based cultures, economies and tradition, and the range of administrative realities. Each of the CAs included select Protected Areas (PAs) – National Parks or Wildlife Sanctuaries; Managed Forests (MFs), and the intervening matrix of other Government, community or private lands so as to constitute a larger delineated landscape. The four CAs were the Anaimalai Conservation Area (ACA) in south India; Garo Hills Conservation Area in the north east India (GCA); Satpura Conservation Area (SCA) in Central India; and Terai Conservation Area (TCA) in the foothills of Himalaya and on the India-Nepal border.

Project Partners

The Project engaged in early 1996 five field researchers with varied backgrounds in Forestry and Life Sciences. They were given orientation training, then posted at the chosen CA with full logistical support from field line personnel at established field stations and camps. In addition, a Co-Investigator (CI) among the participating WII faculty and a counterpart USFS scientist were assigned to each CA. Besides the scientists and managers from WII and the USFS, senior decision-makers from the respective forest departments supported the team of personnel to conduct the work envisaged under the project. Accordingly, the Principal Chief Conservator of Forests and Chief Wildlife Wardens of the five States (Tamil Nadu, Meghalaya, Madhya Pradesh, Maharashtra, and Uttar Pradesh) fully supported the project. Further, the collaborating Institution i.e. the Indira Gandhi National Forest Academy (IGNFA) identified and pledged the services of two senior faculty members for the cause of the project, each of whom has been a line forest officer prior to their assignment at the IGNFA. In all, nearly 40 people from the WII, USFS, collaborating institutes, and the state forest departments were involved in project.

Project Planning Workshop

A Planning Workshop for the project was conducted at WII, Dehra Dun on June 10-12, 1996. The workshop objectives were to increase understanding of the overall project and to gain the support of the key stakeholders. The individual CA descriptions and the critical issues to be addressed were written for each CA. A specific action plan was to be developed for each CA along with the programme of work to accomplish the identified tasks over the project period.

Appropriate coordination structure, monitoring and evaluation efforts were identified. Mr. Tom Darden, Dr. Martin Prather and Mr. Elton Thomas representing the US Forest Service, Mr. G.K. Gupta and Mrs. Usha Kapur representing FERRO, New Delhi, participated in the workshop. The other participants included faculty from WII (17) and IGNFA (3), and managers from the field representing ACA (1), GCA (4), SCA (4) and TCA (1). The proceedings were prepared and provided to the participants and circulated to others separately. The Planning Workshop facilitated the development of a framework of actions during the project period and coordination mechanisms.

Project Approach

The work programme for the project was charted in the Planning Workshop, attended by representatives of all the partners in the project. It is worth mentioning that the wildlife science is of recent origin in India. There is excellent scientific information on plant and animal taxonomy but weak information on species-habitat relationships or species biology. There are no central databases, and retrieval of local information is not easy as automation in data bases is just beginning. One of the most important steps to be taken at the outset was to ascertain, collate, and review the kind and spread of information - maps, unpublished data, research publications, and working plans of agencies. Indents for maps and imageries were decided on the basis of what was available. The ACA, SCA, and TCA had the advantage of a few researchers having worked on some endangered vertebrates, plant communities, and human social systems. Except for GCA, the rest of the three sites had excellent documented forest management histories and current plans.

The project aimed at incorporating modern ecological concepts into a framework applied to CA-specific guides for managers that synthesized technical information and provided strategies for achieving synergy between ecology and forest based economies. Further, the project planned to incorporate project principles, guide books, and management strategies into a managerial training.

Field Work – The Data Realms

Broadly four data realms – ecological, socio-economic, management, and administrative (mechanism of programme delivery through multi-agencies) - were

visualized as critical components for each of the project sites. Sampling strategies were challenging since the project dealt with large landscapes. Established techniques were used to investigate the components under each of the realm appropriately:

- The **ecological** realm considered the status and distribution patterns of plants and animals. Those under special focus included plant species of economic and cultural importance, animals that are culturally important, and those plants and animals that are endangered, threatened, endemic and rare. Elements under threat of illegal exploitation were integral to the foregoing. Besides the species, plant communities of conservation importance, sensitive and key sites and systems were included.

Past and current forestry practices, including silvicultural systems and marking rules, were evaluated for their impact on forest composition and structure, including impacts on special and unique micro-habitats such as snags and logs. Fuel wood collection was integral. There was a much better understanding of silvicultural treatments and their broad impacts on vegetation dynamics than for the species, locations, ecology, productivity, sustainability, and harvest systems of non-timber forest produce. Medicinal plants were of special concern.

- The **socio-economic** realm investigated the relationships between the people and forest based resources. Local people were considered as key players in mitigation and sustainability. This realm has a fluid interface with the ecological data realm as people's interest and activities meld ecological and economic concerns. People's lifestyles and their influences both on the people themselves and on forest systems were also investigated through standard techniques *viz.*, questionnaires, household surveys, rapid assessment and micro planning.

Livestock rearing, grazing and the articulating influences, likewise fuel wood collection constitute very long-term pressures on the forests. Agricultural practices within enclave villages and among peripheral villages are directly related to the nature of pressures on the forests. For example, cropping pattern, crop-depredation by wild herbivores, livestock predation by wild carnivores,

injuries and death of humans as a result of encounters with wild animals were major issues of study. Poaching is another activity that has complex linkages. Mining, quarrying, collection of sand, use of water from streams and water holes were also included as a part of the information base development.

- The **management** realm included understanding and interpreting the impacts of infrastructure development (e.g. roads, fire lines, water holes, hides, etc) and current management practices.
- The **administrative** realm of information includes all management processes for conservation or human development of the region, thus includes multiple agencies and their programmes. The programme targets and dimensions can be varied – from local rural interest through activities of national interest. Information was collected on objectives, mechanisms of delivery, and the outputs of these socio-economic programmes of the Government and private sectors especially evolved for the inhabitants of villages in the forest.

Project Accomplishments

Generating ecological and land use maps to fit the project objectives was a necessity for all sites. Each CA stratified the area based on significant forest/vegetation/habitat types, and established a system of randomly placed transects to assess vegetation structure, composition, distribution, and frequencies of plants of conservation and economic importance. While tree and shrub communities were addressed in detail, the grass and herb communities were addressed in terms of key assemblages and sensitive sites, except in the TCA where tall riverine grasslands and upland dry grasslands constituted significant ecosystems.

Assessments were made on plots of varying sizes placed at regular intervals on the transects. Along with plants, distribution and abundance of larger vertebrates were recorded by indirect evidences with the plots and sightings along the transects. TCA also used a modified experimental design to assess grassland by testing established intervention practices of prescribed burning, harrowing, and grass cutting in different combinations across grass communities. GCA adopted a system of existing natural and man-made trails in an extremely challenging field situation.

Following were the major outputs:

- **Resource Maps** - The project has been able to generate resource maps for all the four sites using the remote sensing and GIS technologies. A spatial data base has been, thus, created for each CA incorporating different layers viz., drainage, administrative/management units, land use/land cover, vegetation, animal distribution, villages, and infrastructure.
- **Baseline Information** – The project has significantly contributed in providing a baseline information on the floral and faunal diversity, land use, historic development, socio-economic condition, wildlife – people conflict, etc. The project has also addressed different biotic pressure in each of the sites.
- **Wildlife Habitat Relationships (WHR)** – A large number of vertebrate species representing the four sites and those unique to each CA based on a species selection criteria were short-listed. The project provided a detailed description on each in each CA and in the overall WHR database.
- **Capacity Building** – The capacity building of the frontline staff was an integral component of the project. New training curricula in the training module for the Post-Graduate Diploma Course in Wildlife Management were formulated for the frontline staff of the forest departments, especially related to habitat assessment and habitat management. A new approach to planning integrated disparate management units (e.g., PAs, MFs, matrix) at hierarchical spatial scales ranging from the CA to the region. These approaches have also been appropriately incorporated in the continuing education courses for middle and senior level forest managers and planners. Changes are also brought about in the training module for wildlife management at the IGNFA. A new course is being developed for forest working plan officers that will be built upon the learning from the project. The chapters on assessment of biodiversity, wildlife and habitat management planning in the draft National Working Plan Code, 1999, were largely based on the learning emerging from this project.
- **Study Tour for the Indian Delegation** - A 13-member Indian delegation visited USA on a study tour from July 24, 1999 to August 7, 1999. The

delegation included five faculty members from the Institute and eight field managers representing the four project sites across five Indian States. The program was jointly prepared and coordinated by Mr. Tom L. Darden and Dr. Hal Salwasser of the USFS, with support by Dr. James R. Stevenson, US Foreign Agricultural Service. The group visited two important regions – the Southern Appalachian Region on the east coast and the Sierra Nevada Region in the State of California and Nevada on the west coast. Visits to different National Forests, wilderness areas and conservation areas were organized. The counterpart US scientists also joined the visiting group during their field visits to different areas and participated in the workshop and project review. In addition to the field visits to different demonstration areas, workshops were also organized at Asheville, NC and the Institute of Forest Genetics (IFG), Placerville, CA. Several resource persons from the USFS, US National Park Service, and the University of California, Davis were invited during the workshops/field visits to provide their technical inputs. The delegates also visited the Department of Forestry Science in University of California, Davis.

Making large-scale ecological assessments on hierarchical scales to address management were central to the study tour. The experience gained in the process was ploughed into the presentations and field demonstrations. The entire experience was extremely relevant to the emerging situation of planning in India and addressed the vital areas of training, research, monitoring, planning and management. Apart from the field visits, the visiting group was paced through different approaches to integrated forest management using the concept of large landscape/conservation areas. Emphasis was laid on different tools and methods for forest and wildlife inventories, habitat assessment, timber management, endangered species management, management of forest insects epidemics, wildlife habitat relationships, fires, recreations, visitor management, ecological monitoring and some significant research especially on the spotted owls in the Pacific Northwest. Several opportunities were also provided for cultural exchange. The visiting delegations also made presentations based on their field/research works on respective Indian sites and related the experience to the element of the study tour conducted.

- **Management Guide** - The project has ultimately provided a new way of thinking about managing for biodiversity at the landscape scale, by taking into account all types of lands, across multiple spatial scales for multiple wildlife species and resource management needs. The project has provided an insight for the conceptual framework, the scientific basis, specific procedures for analysis and operations, and evaluation of select demonstration areas, about how to integrate resource assessment and management for biodiversity at the landscape level.
- **Information Dissemination** – Right from the beginning the project has yielded a substantial information in the form of technical annual reports or specific compilations. The project has significantly contributed in developing a spatial database. The field managers have extensively used the information generated in the preparation/revision of management plans or planning other strategies/proposals. It is evident in the first management plan written for the Dudwa Tiger Reserve (De, 2001) and proposal for the establishment of an Elephant Reserve in the State of Meghalaya. Three Ph.D. dissertations are expected from the project. Researchers of the project have been making research presentations during the Annual Research Seminar organized by the Institute wherein a large number of field managers, scientists, decision-makers participate. The project plans to provide an electronic version of the report for its wider use by the scientific community as well as the field practitioners.

Organization of the Report

The final products of the project include a six volume management guide. The volumes have been produced in collaboration and intense interactions among four full time researchers, the US team of scientists, participating WII faculty, field managers of four project field sites and representative faculty from collaborating institution – IGNFA.

The Volume I addresses the conceptual and scientific basis of the approach, and would be of use to any manager or researcher entrusted with such an approach anywhere. Volume II is on wildlife habitat relationships and includes a framework for how to evaluate multiple wildlife species simultaneously, and

narrative summaries of life histories of 184 wildlife species selected to represent various criteria of rarity, endemism, management focus, habitat associations and others. Volumes III to VI are intensive case studies of four “Conservation Areas” selected across India to represent a great diversity of ecological conditions, CA histories, cultural situations, and management challenges.

Lessons Learned

The four conservation areas studied in this project differed markedly in ecological conditions, socio-economic situation, and management issues. Equally diverse were the arrays of key stressors on the native flora and fauna, and in the management opportunities for improving conditions for native plant and animal diversity and human communities. Many useful lessons have been learnt from the project, principally the need to think broadly across major landscape areas when managing for native species and communities. This includes the need to coordinate data, analyses and management across different land ownerships and allocations. Cumulative effects in buffer areas or zones of influence outside existing protected areas, or even along international borders, are also to be taken into account when developing site-specific management plans. Also, an integrated resource management approach at all spatial scales is seen as the best way to avoid conflicts in resource use and to plan for appropriate ways to conserve biodiversity in managed forests.

Specifically, following is a gist of overall guiding principles and lessons learned from this project :

- *Think* broadly across major landscape areas
- *Integrate* management plans across administrative boundaries and between forest and wildlife resource areas
- *Consider* cumulative effects of all activities
- *Think* in hierarchical spatial scales
- *Use* local knowledge and needs in the conservation strategy
- *Consider* a fuller array of flora and fauna
- *Consider* ecosystem and anthropogenic processes and the ecological roles of organisms

The study categorised stressors into five main groups: (1) stressors associated with resource consumption, (2) stressors associated with use of non-consumptive resource amenities, (3) stressors associated with transportation and habitation infrastructures, (4) stressors associated with effluents, and (5) stressors associated with other human activities having impact on the resources.

Specific management opportunities related to reducing or eliminating the occurrence and adverse effects of the various stressors listed above can be summarized across the four conservation areas are follows:

- Management opportunities and recommendations in managed forests
- Management opportunities and recommendations for identifying natural conditions and native biodiversity
- Management opportunities and recommendations in riparian areas
- Management opportunities and recommendations for roads and transportation systems
- Management opportunities and recommendations for tourism

- Management opportunities and recommendations for protecting rare and locally-distributed species and ecological communities
- Management opportunities and recommendations for conservation of wide-ranging species
- Management opportunities and recommendations on collection and poaching of species
- Management opportunities and recommendations on participation by local people
- Management opportunities and recommendations on research and monitoring

Further, basic ecological understanding also is necessary to modernise silvicultural systems by moving them from a focus simply on the production of wood and other human goods and services, to the production of both human and ecological goods and services by restoring or maintaining diversity and viable forest ecosystems. The transition from old to “new forestry” will be critical for integrating PAs and MFs to meet ecological goals described for conservation areas. The transition likely will require a period of adjustment of attitudes and experimentation with new methods, such as use of adaptive management approaches.

Chapter 1

General Description

1.1 Significance and Historical Background

The Anaimalai Conservation Area (ACA) falls within the Western Ghats mountain chain of southwest India, a region designated as one of 25 Global Biodiversity Hotspots (Myers 1990, Gadgil 1993, Myers et al. 2000). The biota of this region is not only highly diverse, it is distinctive with over 2,000 endemic species of plants and over 300 endemic vertebrates (Abdullah and Nayar 1986; Swengel 1991; Daniels 1993,1997, Myers et al. 2000). With an average population density of 428 people per km², the Western Ghats region is also the most densely populated of the world's biodiversity hotspots (Cincotta and Engelman 2000). Brooks et al. (2002) report that 894 species of plants (41% of endemic species) and 118 species of vertebrates (33% of endemics) are either threatened or extinct. High density of people and their attendant demands for food, fuel, and other resources create special challenges for conservation of biological diversity in this remarkable region.

The ACA itself supports a diverse fauna and flora, well representative of the region as a whole. Endemism is quite high in the ACA, which is the stronghold of the last remnant populations of the Nilgiri Tahr as well as the Lion Tailed Macaque among endemic mammals. Other noteworthy endemic mammals include Nilgiri Langur, Grizzled Giant Squirrel, Small Travancore Flying Squirrel, and the Malabar Giant Squirrel. A total of 51 mammalian species (including 7 endemics), 269 avian species (14 endemics), 43 reptilian species (14 endemics), 47 amphibian species (30 endemics), 28 fishes (18 endemics), and 143 butterflies (13 endemics) are known to occur here (see Chapter 2). Due to the

topographic, edaphic and climatic diversity, ACA harbors an exceptional array of vegetation types ranging from Tropical Dry Thorn forests to the Temperate Wet Montane Shola Grassland systems totaling fifteen vegetation types. The endemism of the vegetation is also rich. It has been reported that ACA supports 39 endemic plant species or one species every 51 per sq. km area (Rodgers & Panwar1988).

A variety of commercial interests have influenced land use patterns in ACA. The area receives high rainfall and, has fertile soils on the gentler slopes. These factors favor cash crops such as tea, coffee and cardamom. It is notable that many multinational companies operating in the region grow some of the best quality tea in Southern India, which fetches high earnings in the export market (Management Plan for IGWLS 1997-2002). Cinchona, Wattle, and Blue Gum are the chief commercial crops. The region also possesses some of the best quality teak in Southern India and has greatly contributed to the revenue generated by the Forest Department of Tamil Nadu. Thus both hardwood and softwood monocultures are widespread in this area and are an important facet of the regional economy. Local tribal economy is largely dependent on the various non-timber forest products (NTFP) found abundantly in the forests of the ACA. The Forest divisions situated here supply valuable raw material to two major local industries: paper and tannin. Surrounding lands within the Coimbatore and Madurai districts have widespread agricultural crops such as rice, plantain, banana, and coconut.

The Anaimalai Conservation Area is further notable for the ecosystem services that it provides; the vast terrain of the area forms a watershed for several rain

fed river systems. They, in turn, form the source of water for multipurpose river valley irrigation cum hydroelectric projects notably the Parambikulam-Aliyar Project. The prosperity of the agricultural belt in Coimbatore and Madurai districts is dependent on these life support systems.

Culturally, the ACA is known for the Palani shrine that is one of the famous centers of the Shaivite faith. The region is also known for its large anthropological diversity and is home to a number of tribes including Kadar, Malasar, Malaimalasar, and Muduvar.

1.1.1 History of the Area and the Forests

Western Ghats: An Ecological Point Of View

People have been living in the tropical forests for millennia and very little of these forests, if any, remain 'pristine' (Hladik *et al.* 1993). The Asian forests were inhabited by hunter-gatherers more than 10,000 years ago (Kajale 1993). The Western Ghats came under human influence during the Paleolithic or Old Stone age over 12,000 years BP. Charcoal of 5,000 years BP, excavated from the trenches of the Tenmalai, Kollam District, Kerala indicates that people could have burnt forests (Chandran 1997). A study of the peat bogs of montane Nilgiris of the Western Ghats by Sukumar *et al.* (1993) suggests a shift of C₃ vegetation (C₃ Forest/grassland) towards C₄ vegetation (Grasslands) during 6,000-3,500 years BP, due to low rainfall and lower CO₂ levels.

Ward and Conner, in their memoirs of the Survey of Travancore and Cochin States, during 1816-20, mention that each river was rented out for the extraction of Teak (Ward *et al.* 1827). The shifting cultivators seem to have normally occupied a zone below 1,000 m (Bourdillon 1893). In Western Ghats, conservation went hand in hand with utilization in the pre-colonial era. Hunting was subjected to many community regulations (Gadgil 1989). The Sacred groves are typical examples of a sense of conservation

that existed in the minds of the people in those times.

History of the Forests - an Administrative point of view

The Forests of the ACA comprises three major divisions; Anaimalai Wildlife Sanctuary, Dindigul, and Kodaikanal Reserve Forests. The history of each unit is dealt separately below.

1.1.2 Anaimalai Wildlife Sanctuary

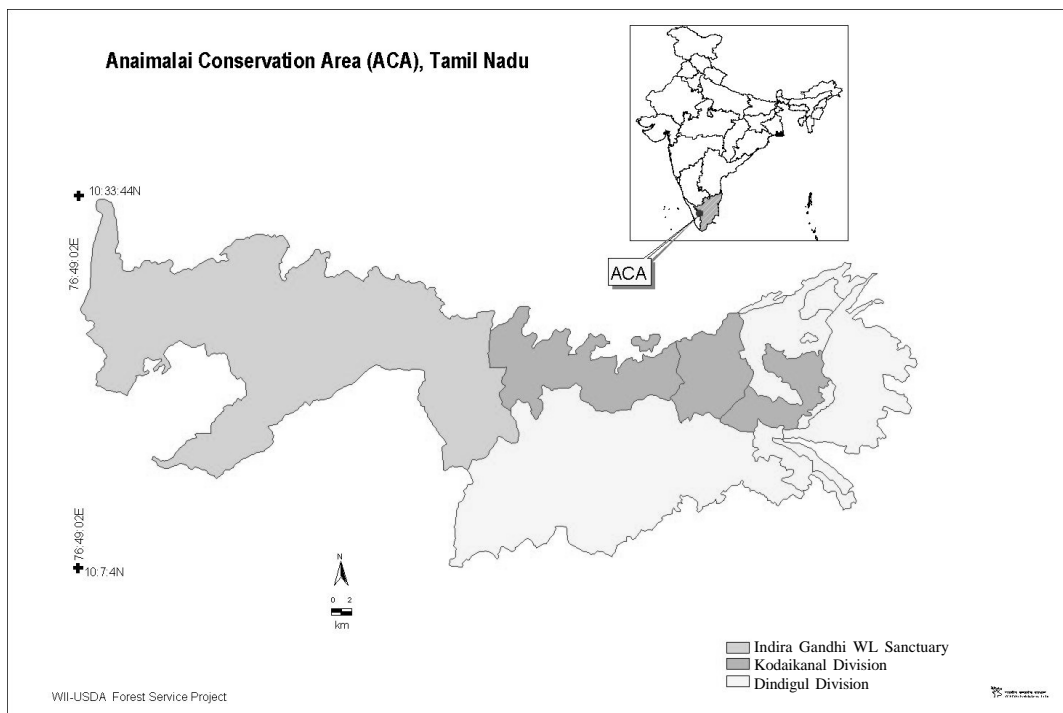
Anaimalai Wildlife Sanctuary, now known as the Indira Gandhi Wildlife Sanctuary is the largest Forest Administrative unit of the ACA. The history of the Sanctuary is being treated in two major parts: Pre-British Period and British Period.

Pre-British period

The Kings of these areas were said to have used for the collection of the ebony cinnamon and sandalwood very early in the history for the exportation to the countries like Rome as exhibited by the Roman coins excavated from the region. The richness of the forests of this region was one of the reasons of the war amongst the Kingdoms like Chera, Pandya, the Pallavas, Gangas and Cholas. This period has witnessed political upheavals in plenty, among the native rulers and chieftains. Pandyan rule was well established till the beginning of the Christian era in 1326. The Vijayanagar Kingdom came in to ruling in 1378. Somewhere in 1529 Nayaka Kingdom came in to power and continued till 1736. No significant information is available on the condition of the forests in these periods. From the then existing literature we can understand that the Rulers used to go to the forests for the hunting purpose during these periods both for sport and as a part of protecting the people from the attacks of the wild animals.

British Period

In the early days of the British Rule, the forests were not well maintained or conserved. Random timber extractions by the Rulers of the past for various



purposes like house construction or other domestic purposes were in vogue.

With the advent of the then Bombay Dockyard engaged in the construction of the vessels and war ships, teak trees were required in large quantity. Thus in 1820, a preliminary survey was conducted by Mr. Connor and Mr. Ward. In 1847 Major B. C Cotton was engaged for the assessment of the forests of the Anaimalais. His report in 1848, showed how wastefully this tract was used for the timber extraction. He highlighted the availability of the timber and thus resulted in the change of the ruling from the local *Nambidis* to the British assigned officer (Ranganathan's Working Plan 1938-48).

Subsequent to this, Captain Michael was appointed to assist Major Cotton in leasing of the forests from the *Nambidis*. It was the Sichali valley that suffered the most in this period of extraction. Captain Michael and Captain Douglas Hamilton remained in charge till the Madras Forest Department was formed in 1856. Fortunately the vessel constructions were stopped, thus

considerably reducing the extraction of timber from the forests of the region.

In 1868 Jungle Conservancy was formed for the rest of the divisions and an overseer was appointed for Pollachi and Udumalpet Taluks with a sub-overseer at Dhali and a separate overseer for the minor forest produce for the entire Anaimalais. Softwood and fuelwood was allowed free removal; the hard wood was sold for nominal price.

In 1872 the Collector of the Coimbatore district replaced the Jungle Conservancy Department and the free permit system was continued. Overseers and the Sub-overseers were redesignated as the Rangers and Foresters and the posts of Forest guards and Forest watchers were created. The transfer of the power to the Collector came as the re-organisation of the department in the entire Madras Presidency. The collector was designated as "Collector and Conservator of Forests".

Even prior to the reservation, Anaimalais was included

in a separate division called Coimbatore South Division. In 1879 both North and South Coimbatore Divisions were amalgamated. In 1882 the Forest Act was introduced and the reservation of forests commenced, which was completed during 1883 to 1885. Coimbatore South Division was again separated from the North Division in 1885, but was retained as a part of the Coimbatore Central Division. In 1906 Palghat Range of the Malabar District was also transferred to the Coimbatore South Division. In 1921 Palghat Forest Division was formed and simultaneously the Coimbatore Central Division was abolished. The Palghat Range was included in the new divisions while the Coimbatore South Division was left to comprise areas of Anaimalais only. In 1955 headquarters of the Division was shifted to Pollachi. (Incidentally the Thekkadi leased forest which was notified in 1883, become a part of Kerala state on 1st November 1956.) After the process of reservation was over, the Government had set apart an area measuring 19114.13 hectares of virgin forestland from Valparai for raising tea, coffee and cardamom on assignment and subsequently these areas were dis-reserved and excluded from administration in 1936. In 1938 Dhali Reserved Forest was dis-reserved followed by dis-reservation of 264.26 hectares in Amravati Reserved Forest in 1943 specifically for multipurpose river valley projects. The Amravati project was completed in 1957.

History of Working Plan

In 1889, Mr. J.S. Porter drew up a Working Plan for about 971 hectares of forest south of Sethumadai, which was revised by Mr. H.B. Bryant. Neither plan was sanctioned. In 1896 Gass prepared a Working Plan for Ayerangal Fuel Series, which was approved. In 1902 Foulkes prepared Working Plans for Pollachi range and for Udumalpet range in 1902 but both the Working Plans were not sanctioned. In 1906 Arbuthnot prepared Working Plan for Ulandy Valley. He also prepared Working Plan for Punachi Range, which remained in force till 1925. In 1916 C.C.

Wilson was appointed as Working Plan Officer and subsequently left for military duty after preparing the Reconnaissance report and Mr. H.F.A. Wood took over the charge and completed the Working Plan, which operated until 1931. Mr. Habibullah revised Foulkes Plan, which operated until 1934. In 1920 Mr. E.M. Corthers drew up a summary of prescriptions for Pollachi range, which were subsumed in the Working Plan, prepared by W.G. Dyson for Pollachi range. In 1925 Mr. Code revised Arbuthnots plan, which remained in operation till 1934. Mr. Laurie in 1927 prepared Working Plan for Mount Stuart Forests, by revising Wood's plan, which lasted till 1941. Mr. A.N. Sharma in 1935 prepared the Working Plan for the whole division, which was in force from 1935 - 1936 to 1944 - 1945. In 1939 Mr. Venkateswara Ayyer was appointed as Working Plan Officer for the preparation of the first consolidated Working Plan for the whole Coimbatore South Division. This plan remained in force till 1952. It was revised by Mr. Bhojashetty, and came in to force in 1954-55. Subsequently Mr. J. Wilson revised it for the years 1965-75. Mr. Shanmugasundaram revised this plan in 1978, which was not approved. Mr. J. Wilson's plan was followed till 1984 for the teak forest canopy manipulations. However the prescriptions from the Shanmugasundaram's plan were used for the Eucalyptus working.

1.1.3 The Dindigul & Kodaikanal Divisions

Both these divisions were under the same administrative set up in the earlier parts of their history, and have undergone various developments- political, managerial and administrative. For comprehensive and exhaustive understanding, the history of this division of forests can be described under as 1). Pre-British Period and 2). British Period

The History before the British rule is the same as that of the Anaimalai WLS (K. S. Dahal's Working Plan 1984-1994).

British Period

As usual, it was the most eventful part in the history of the area. Several rebellious changes in the administrative as well as the managerial side took place during this period. The Dindigul came in to the formal British ruling by the treaty of 1792. Madurai came in to British hands by 1801 from the Nawab of Carnatic. No work worth mentioning was done to preserve the forests till 1852. In 1852 the felling operations were regulated through license, free of cost, to be issued by the revenue authorities. The small revenue thus earned also stopped in 1854 with the abolition of the leases. However in 1856 shifting cultivation was banned in Palanis and to enforce the law, a Forest Overseer was appointed in 1860. Large chunks of forest were still under the revenue department till 1863 when a Sub Assistant Conservator was appointed for more effective control. The birth of the actual forest department was enhanced by the South Indian Railways' special interest in the forests. In 1869 a District Forest Officer was appointed in the rank of Deputy Conservator.

In 1871 a Forest establishment was sanctioned and Madurai forest Division was constituted with two ranges as Madurai range and Periakulam range. In 1880 on recommendations of a committee consisting of Collector, Deputy Conservator on special duty and the Deputy Conservator of the District, 21 forest blocks measuring 285 sq. miles were selected for reservation. In 1882 Madras Forest Act was passed. By 1890 most of the forest of the country was demarcated and notified as "Reserved Forests" and the Survey of India mapped nearly all of them by 1894. In 1893 a re-organisation of the ranges took place for easy management and 5 ranges were made viz. Cumbum, Kodaikanal, Thandigudi, Palamedu and Kanavoipatti.

In 1900, the first forest Working Plan of the range was prepared by Mr. Porter as the first step to the beginning of systematic and scientific working of the forest.

In 1914 Kodaikanal and Thandigudi ranges were reconstituted and the headquarters of the later was shifted to the Palani. In 1916 Ayyalur, Sholavandan and Natham ranges were carved out from the Kanavoipatti and Palamedu ranges. In 1935 Manjampatti and a part of the Kudirayar range was handed over to the Coimbatore (South) division.

History of the Plantations

In 1869-70 Colonel Cambell Walker started planting Teak as part of the efforts to increase the commercial value of the forests at Velanecombai at the northern foot of the Palanis and Vanathiparai near the foot of the ghats near the Periyar Lake. 1887-88 witnessed the *Eucalyptus globulus* introduction in Upper Palanis with a view to provide fuel wood for the Kodaikanal township, so as to help save the neighbouring shola from destruction. In 1883-84, Wattle plantation consisting of *Acacia dealbata* was raised at Poombarai village. Several Pine species were tried in the region during 1906-20, with the first introduction of it by Mr. M. B. Bryant in 1906.

In 1882 The Madras Forest Act came in to existence and steps were taken to reserve the forests for protection, and most of them were notified between 1887-1890.

Post independence period

This period saw further intensification of the laws and all the estate forests were acquired under the Estate Abolition Act 1947 and were placed under the Forest Department. The enlargement of the area was closely followed by the bifurcation of the area in Madurai West and Madurai East Divisions in 1951 and both the divisions had their Headquarters at Madurai District. Ayyalur range from the then Madurai West Division was transferred to the newly formed Tiruchiraplli Division in 1949 for better management. In 1954 this area with portions lying within the Madurai revenue district was re-transferred to Madurai West division due administrative reasons. In 1957 at

the time of the state re-organisation, the forests were also re-organized and the Madurai West division was renamed as the Madurai North division with Kodaikanal as the Headquarters, and attached with the Coimbatore Circle. The Cumbum range of the erstwhile Madurai West division was added to the newly formed Madurai South Division, simultaneously Ramanathapuram Forest Division was formed to look after all the forests of the Ramanathapuram District.

1.1.4 Past System of Management

Pre-planning period

From the above history it is clear that little was done for the conservation of the forest in the period prior to 1900. In 1900 the Porter's scheme laid the foundation for the management of the forests in these parts of the country. A noteworthy event in altering shola vegetation was the planting of Eucalyptus plantations in Kodaikanal in 1887.

Semi-planning period

It starts with the ushering of the Porter's plan, which mainly dealt with the supply of fuel, small timber, manure leaf, and meeting the grazing and browsing demands. He allowed 38 fuel series and goat browsing in the forest. Mr. H. B. Bryant revised this plan in 1907 and again in 1911. He stopped goat browsing in the state forests and introduced Pine in the Upper Palanis.

In 1916 Mr. C. C. Wilson revised the plan and increased supply of fuel from the forests. Mr. Woodhouse Adolphus prepared the first Bamboo circle with a felling series of three years in 1918-19. Schemes for an increased supply of the fuel were prepared in 1922 and 1929 by Mr. Srinivasa Ayyangar and Mr. Esvara Ayyar respectively. Mr. J. A. Master's (1931) plan was meant for the improvement of the pine plantations after the 1930's disastrous cyclone and it was the last Working Plan of this period.

Planning period

This refers to a period after 1936 till date. During

this period all the forests of the Madurai district were brought under the proper Working Plans based on scientific principles. Madurai underwent several Working Plans during this period. A brief history of them is summarised as follows

Venkateswara Ayyar's plan (1936-1946)

This was the first Working Plan to include all the forests of the Madurai District. It consists of nine working circles such as 1). Selection Working Circle, 2). Clear felling working Circle, 3). Fuel Working Circle, 4). Brake Pole Working Circle, 5). Bamboo Working Circle, 6). Sandal Working Circle, 7). MFP Working Circle, 8). Lac Working Circle, 9). Protection Working Circle.

Ghate's Working Plan (1949-60 & 1962-63)

The Venkateswara Ayyar's Plan was revised by N. S. Ghate for the period 1949-50 to 1962-63. He formed the following Working Circle 1). Timber Selection Working Circle, 2). Teak Conservation Working Circle 3). Fuel Working Circle, 4). Concentrated regeneration Working Circle 5). Manure leaf Working Circle 6). Brake Pole Working Circle, 7). Bamboo Working Circle, 8). Wattle Plantation Working Circle 9). Lac Working Circle, 10). MFP Working Circle, 11). Protection Working Circle.

Ghate's Working Plan was revised by the A. M. Tholamani Devar in 1956 with the following Working Circles to include the newly rearranged ranges. 1). Wattle Working Circle 2). Matchwood Conversion Working Circle, 3). Teak Working Circle, 4). Rehabilitation Working Circle, 5). Fuel Working Circle, 6). Blue gum Working Circle, 7). Bamboo Working Circle, 8). MFP Working Circle 9). Grazing Working Circle, 10). Manure Leaf Working Circle.

Mr. Tholamani Devar's Working Plan was revised by Mr. M. S. Karunakaran.

A working Circle means a geographical area assigned to a particular set of Silvicultural Principles in a particular Working Plan. The assigned jobs may vary with the Working Plan and the Working Circles. The

Working Circles were meant for the better management of the forests of the area. The Working Circle System is not very much active in Tamil Nadu State.

Teak Plantation Working Circle

This was mainly meant for the improvement of the teak plantations throughout the ACA. The working was mainly to increase the forest timber quality by adoption of necessary artificial methods.

1.2 Area Size

The Anaimalai Conservation Area totals about 2338 km². The area includes the Anaimalai Wildlife Sanctuary, and managed forest of the Dindigul and Kodaikanal districts. The Anaimalai Wildlife Sanctuary is the largest administrative block of the region and covers 966 km². The Kodaikanal division covers 385 km² and the Dindigul division covers 987 km² (**Plate 1 - ACA Area & Location Map**).

1.3 Location

ACA is located on an easterly-directed spur of the Western Ghats mountain chain comprising the Anaimalai and the Palani hills. It spans three civil districts in the north west of the Tamil Nadu state namely Coimbatore, Dindigul and Madurai and lies between longitudes 76° 49" 02'E and 77° 50" 40'E and 10° 7" 4' N and 10° 33" 44' latitudes (**Plate 1 - ACA Area & Location Map**).

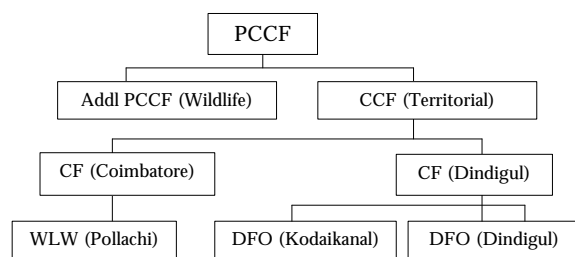
1.4 Current Administration

The Tamil Nadu Forest Department has its headquarters in the city of Chennai, with overall responsibility for policy formulation vested in the Secretary of Forests to the Tamil Nadu Government. The Minister of Forests, currently of Cabinet rank, provides political leadership. The technical Head of the Forest Department is the Principal Chief Conservator of Forests who guides the Government in formulating policy level decisions.

The Forest Department of Tamil Nadu has several technical wings, each headed by a Chief Conservator

of Forests. An Additional Principal Chief Conservator of Forests who is also the Chief Wildlife Warden for the State heads the Wildlife wing, a major organ of the Department. The Wildlife wing of the Department has several Circles and the Anaimalais Division is under the administrative control of the Conservator of Forests (Wildlife) Coimbatore. Territorial Divisions, which constitute the Managed forests, are under the administrative control of the Chief Conservator of Forests.

Administrative flow chart TN Forest Department



ACA is found spread over two Forest Circles namely Coimbatore and Dindigul Circles. It is constituted of three Forest Divisions namely Anaimalais, Dindigul and Kodaikanal under the above-mentioned Forest Circles. The Kodaikanal and the Dindigul Forest Divisions are the Managed forests of the Conservation Area. Forest Divisions in Tamil Nadu are subdivided into Ranges and Sections respectively under a Range Officer and a Forester. There are 6 Ranges in Anaimalais, five in Dindigul and six in Kodaikanal.

1.5 Physiographic Conditions

1.5.1 Geology and Rocks

The primary substrata is of igneous rock dating to Pre-Cambrian period. The major types of rocks within the Sanctuary are Charnockite, Granitic gneiss, Granites, Leptynite, and Calo Granytes. These are intruded by lateral streaks of quartz and pegmatite. The main geological formations of the area are hornblende-biotite gniesses, garnetiferous-biotite

gniesses. Charnockites are often intruded by granitic-ortho-gniesses and plagioclase porphy dykes.

1.5.2 Soil

The soil is red and sandy in the lower elevation, whereas the soil is black sandy loam with noticeable accumulation of the humus in the middle and higher elevations. Soils are mainly formed by the disintegration of the Charnockite rock, which is rich in ferruginous material supporting good vegetation growth in the hills. The ground is often rocky.

1.5.3 Terrain

The topography is typical of that of the Western Ghats with its undulating mountains and steep rocky slopes. The ACA has considerable stretches of the bare rocky open areas and steep slopes which harbors several endemic flora and fauna such as *Bentickia codappanna*, and Nilgiri Tahr. Elevations vary from c 200 m to c 2550 meters above msl. The highest peak, Thanakkamalai, is about 2523 m high. Anaimalais fall precipitously to the cultivated plains towards the northern side.

1.5.4 Climate and Rainfall

Anaimalai Conservation Area enjoys both the North Eastern and SouthWestern Monsoons. A wide variation in rainfall can be seen throughout the ACA with annual rainfall varying from 500 mm in the lower elevations to 5000 mm in the higher elevations. The very high altitudinal range causes great variation in temperature, which varies from 23° C to 40° C in the plains and 10° C to 20° C in the hills during the summers and 15° C to 29° C in the plains and some times falling below the freezing point in the upper elevations in the winters. December and January are the coldest months of the year with February to May as the hottest time of the year. The southwestern monsoon usually occurs from the end of the May to the middle of the August. The northeastern monsoon

occurs in October and November. About 60% of the sanctuary receives major precipitation during Southwest monsoon. The leeward area receives highest rainfall during Northeast monsoon. The southwestern slopes receive highest rainfall - about 5000mm. The Northwestern corner facing the Palaghat gap has rainfall about 1250mm and the northeastern slopes receive the lowest rainfall about 500mm. Kodaikanal receives a lesser average rainfall with the highest record c 1800mm. The southern wind sets in early April and the tract is subjected to strong gales. The wind normally brings Southwest monsoon during late May and June, afterwards precipitation becomes a regular feature in the higher reaches. The ACA does not experience strong rains during December to May.

1.5.5 Water

The ACA is blessed with innumerable streams, tributaries, wetlands, reservoirs, rivers and ponds. Very few of these are perennial. Some of the important water sources of the ACA are Amaravathi river, Aliyar river, Varagali Ar, Periyar, Sholai Ar, Idamala Ar, Tunakadavu Ar, Nallar, Palar, Chinnar, Gundar and Parappalar. The Parambikulam - Aliyar hydroelectric project in this area had resulted in the construction of dams namely - Sholayar, Upper Aliyar, Tirumurthi dam, Amaravathi dam in Udumalpet taluk, Nirar and Kadamparai dams in the Anaimalai Wildlife sanctuary. The main water sources of Kodaikanal are Parappalar, Gundar and Berijam Lake. Other perennial sources, which are completely rain fed, drain in to these major water sources. (**Plate 2 - ACA Drainage Map**).

1.5.6 Biogeographical Classification of the region

The Sanctuary falls under the Ceylonese sub-region of the Oriental region, and in the Anaimalai and Palani subdivisions of the 5B Western Ghats mountains biotic province of the Western Ghats Zone (Rodgers & Panwar 1988).

Plate -1 Anaimalai Conservation Area (ACA), Tamil Nadu

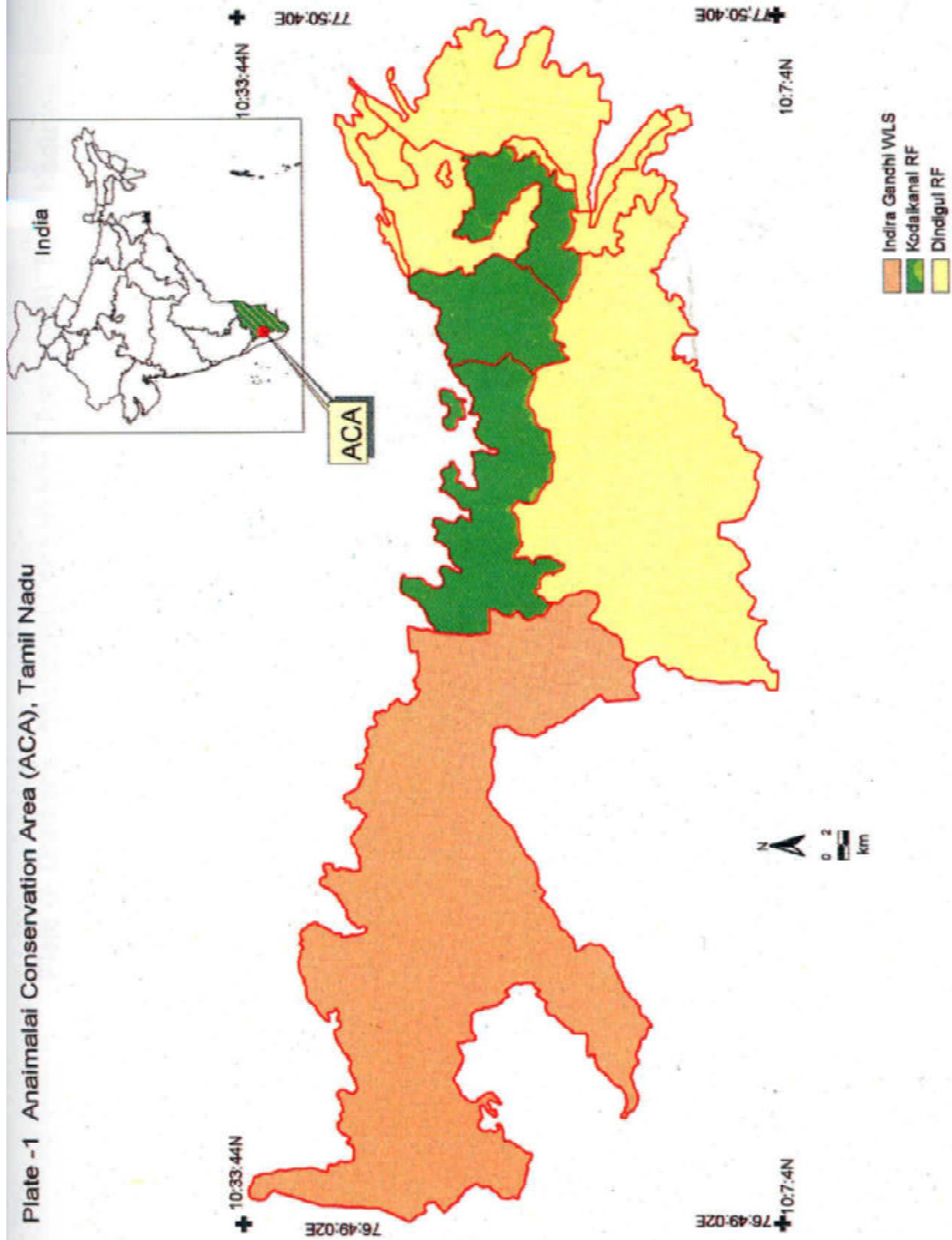
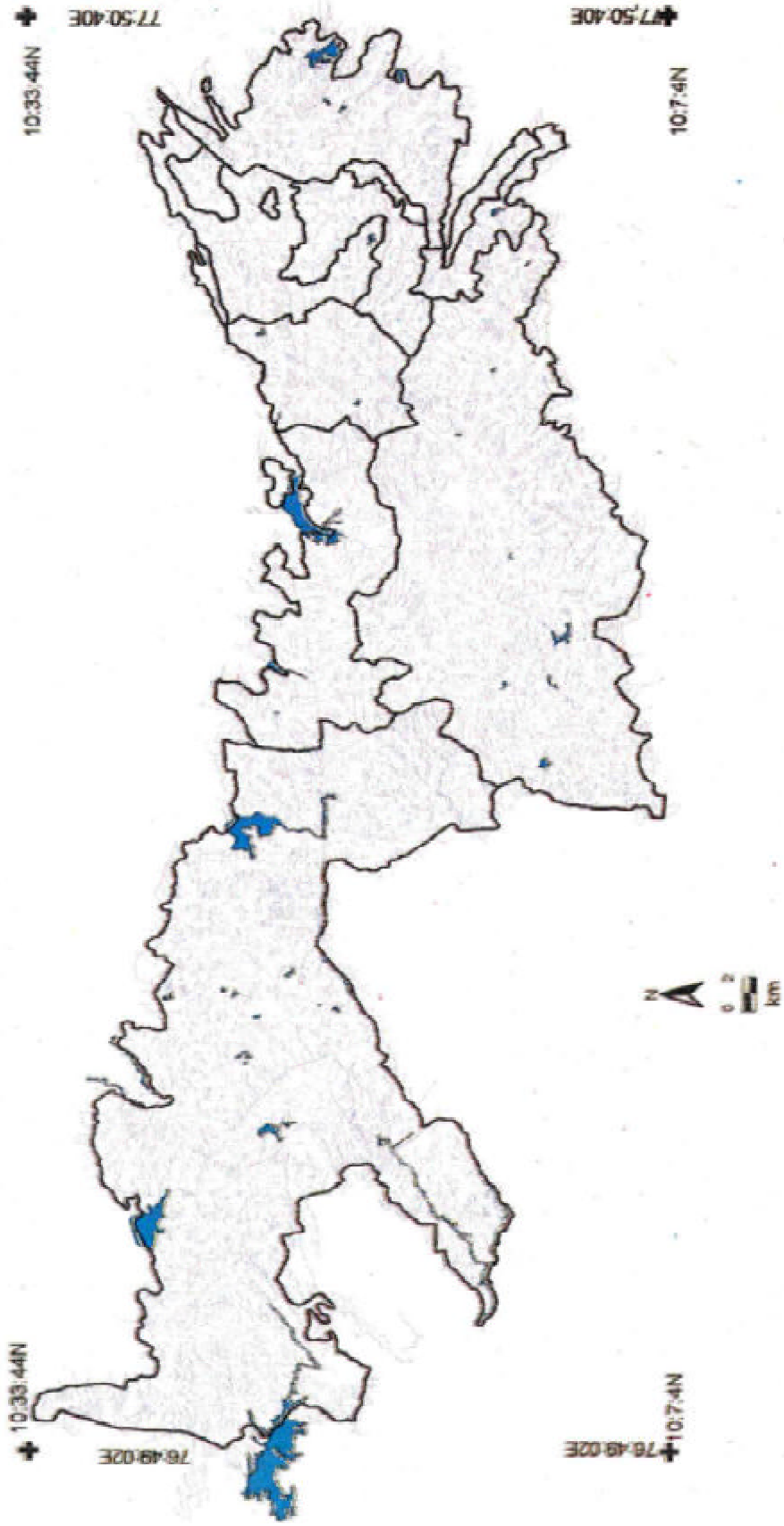


Plate -2 Drainage - Anaimalai Conservation Area (ACA), Tamil Nadu



Chapter 2

Vegetation

2.1 Type Descriptions and Extent Including Man-Made forest

Twelve major forest types have been reported from this region (Champion and Seth 1968). Plantations are also common in ACA. Different plantations are given a brief introduction in the end of the chapter. **(Plate 3 - ACA Vegetation Map).**

Table 2.1 Vegetation type & Extent

Vegetation type/ class	Area (in hectares)
Evergreen	24541.80
Southern Moist deciduous	18239.80
Montane Shola	26987.60
Dry deciduous	6811.04
Scrubland	47713.32
Southern Thorn	3093.28
Riparian	1321.36
Moist grassland	5201.00
Dry grassland	12476.92
Mixed Area	9432.28
Teak Mixed	111.20
Bamboo Mixed	14471.80
Plantation	423.36
Teak plantation	3882.68
Eucalyptus	3796.36
Wattle	3188.32
Pine	71.36
Softwood plantation	435.44
Tea plantation	1596.04
Coffee plantation	15265.84
Rubber plantation	1028.48
Banana plantation	104.64
Agriculture	967.48
Fallow land	15053.60
Rocky outcrop	10466.88
Township	1846.84
Wetland	11.68
Water	5271.68
Total	233812.08

Table 2.2 - Division wise Vegetation type & Extent

Vegetation type/ class	Indira Gandhi WLS Area (in ha)	Dindigul division Area (in ha)	Kodaikanal division Area (in ha)
Evergreen	5897.40	14072.04	4572.36
Southern Moist deciduous	15684.96	762.32	1792.52
Montane Shola	15314.36	9337.68	2335.56
Dry deciduous	2660.28	2070.76	2080.00
Scrubland	21444.56	15289.52	10979.24
Southern Thorn	2926.24	167.04	-
Riparian	1170.40	150.96	-
Moist grassland	4170.28	941.88	88.84
Dry grassland	1525.52	9149.32	1802.08
Mixed Area	223.44	9005.36	203.48
Teak Mixed	111.20	-	-
Bamboo Mixed	7745.32	2705.32	4021.16
Plantation	14.96	281.68	126.72
Teak plantation	3882.68	-	-
Eucalyptus	2275.68	1520.68	-
Wattle	-	3097.84	90.48
Pine	-	71.36	-
Softwood plantation	-	435.44	-
Tea plantation	1596.04	-	-
Coffee plantation	1608.20	8021.60	5636.04
Rubber plantation	1028.48	-	-
Banana plantation	-	104.64	-
Agriculture	729.20	135.40	102.88
Fallow land	14.20	14596.76	442.64
Rocky outcrop	2771.24	4278.80	3416.84
Township	-	1846.84	-
Wetland	-	11.68	-
Water	3854.48	629.80	787.40
	96649.12	98684.72	38478.24

Note : The vegetation area so computed for each division is not in conformity to the administrative area of the division.

(Plate 4 - Indira Gandhi Wildlife Sanctuary Vegetation Map).

(Plate 5 - Dindigul Forest division Vegetation Map).

(Plate 6 - Kodaikanal Forest division Vegetation Map).

Fig 2.1 represents the major vegetation types in the ACA and it is seen that the major forest composition is of scrubland, which is available on the foothills and lower reaches of the Indira Gandhi wildlife sanctuary and Dindigul forest divisions. As we approach towards higher reaches, the composition changes towards moist deciduous and evergreen forests finally constituting Shola-grassland association in the upper reaches.

Fig 2.1 Major Vegetation types in the ACA (in ha)

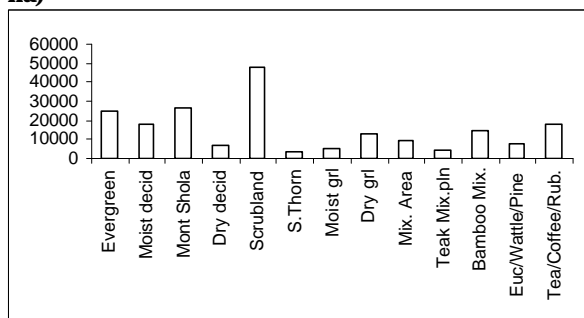
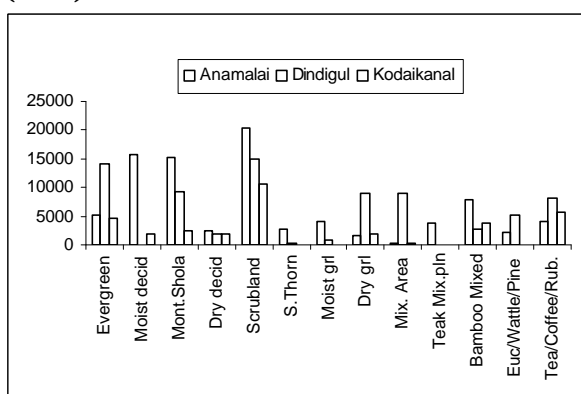


Fig 2.2 represents major vegetation communities in the three divisions of the Anamalai Conservation Area. Indira Gandhi wildlife sanctuary is dominated by scrubland in the foothills with moist deciduous in the higher reaches and montane shola in the upper reaches. Dindigul division besides having scrubland in the foothills has dominant evergreen forests with montane shola in the upper reaches. Kodaikanal depicts substantial commercial crop with tea, coffee and rubber in its composition besides evergreen patches in the higher reaches.

Fig 2.2 Major Vegetation Communities by Division (in ha)































IA/C4 West Coast Tropical Evergreen Forests

These forest types were seen in the areas where the rainfall is in between 1,500-5,000mm mainly in the areas affected by both the NE and SW monsoons. These are some of the best forests where vertical stratification of the vegetation can be clearly seen. The height of the forest diminishes with higher elevation, eventually changing to high elevation montane shola forests as we go higher and higher. The evergreenness of the forest remains but the trees show a considerable stunted growth in these shola forests. There are several associations in this type of forest. The main floristics are *Hopea parviflora*, *Mesua ferrea*, *Polyalthia fragrans*, *Diospyros microphylla*, *Eugenia gardeneri*, *Canarium strictum*, *Artocarpus lakoocha*, *A. heterophyllus*, *Cinnamomum zeylanicum*, *Mangifera indica*, *Dipterocarpus indicus*, *Calophyllum elatum*, *C. wightianum*, *Holigrana arnottiana*, *H. grahamii*, *Olea dioica*, *Polyalthia coffeoides*, *Machilus macaranga*, *Artocarpus hirsuta*, *Vitex altissima*, *Tetrameles nudiflora*, *Myristica laurifolia*, *Hydnocarpus laurifolia*, and *Hopea parviflora*. (**Plate 7- ACA Evergreen forest Vegetation map**).

II A/C1 Southern Montane Wet Temperate Forest

This type of forest occurs in the Upper Palani Plateau, Akkamalai Grass Hill area and Kodaikanal areas of the ACA, above 1200m elevation and mean annual rain fall varying between 2,000mm-6, 250mm or even more. It is a closed evergreen forest, the trees being mostly short bole and heavily branched, often attain considerable girth. The height of the forest is comparatively low, rarely exceeding 6-8 meters. The crown is usually dense and rounded with entire coriaceous leaves that tend to be red when young, giving a range of colours to the forest canopy throughout the year. The leaves are normally of very small size and shining dark green in colour typical of the evergreens. They occupy the areas where some sheltering is provided by the rolling, undulating nature of the terrain. The flora of these forests is varied with a mixture of both temperate and tropical elements in

Plate - 3 Vegetation - Anaimalai Conservation Area (ACA), Tamil Nadu

- | | | | | | | | | | |
|---|---|---|---|---|---|---|---|--|---|
|  Evergreen Moist |  Southern Moist Deciduous |  Montane Shola |  Dry Deciduous |  Southern Thorn Forest |  Scrubland |  Riparian |  Mixed Areas |  Dry Grassland |  Moist Grassland |
|  Wattle |  Pine |  Plantation |  Softwood Plantation |  Bamboo Mixed |  Teak Mix |  Teak Plantation |  Eucalyptus Plantation |  Tea Plantation |  Coffee Plantation |
|  Rubber Plantation |  Banana |  Agriculture |  Fallow Land |  Rocky Outcrops |  Township |  Water |  Wetland | | |

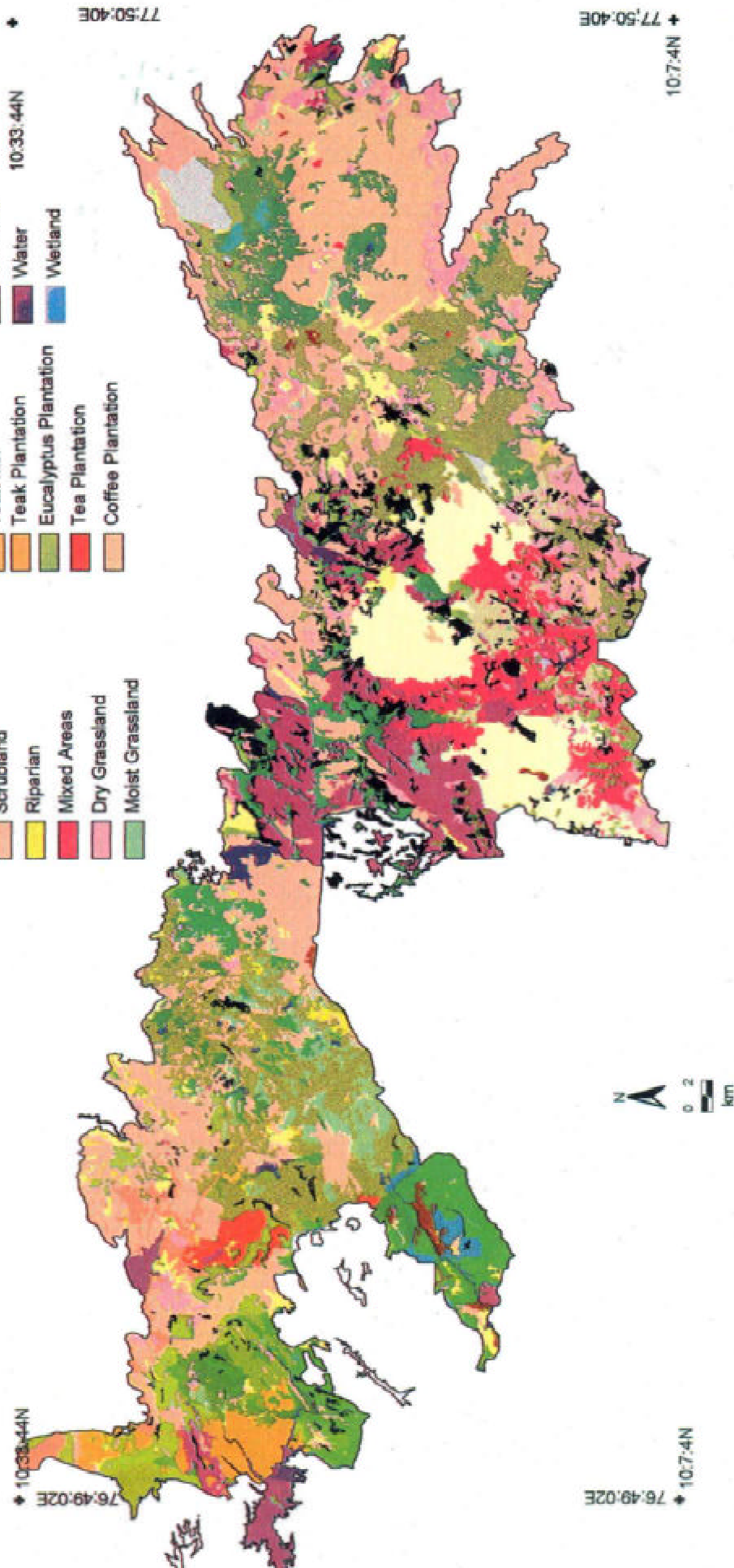
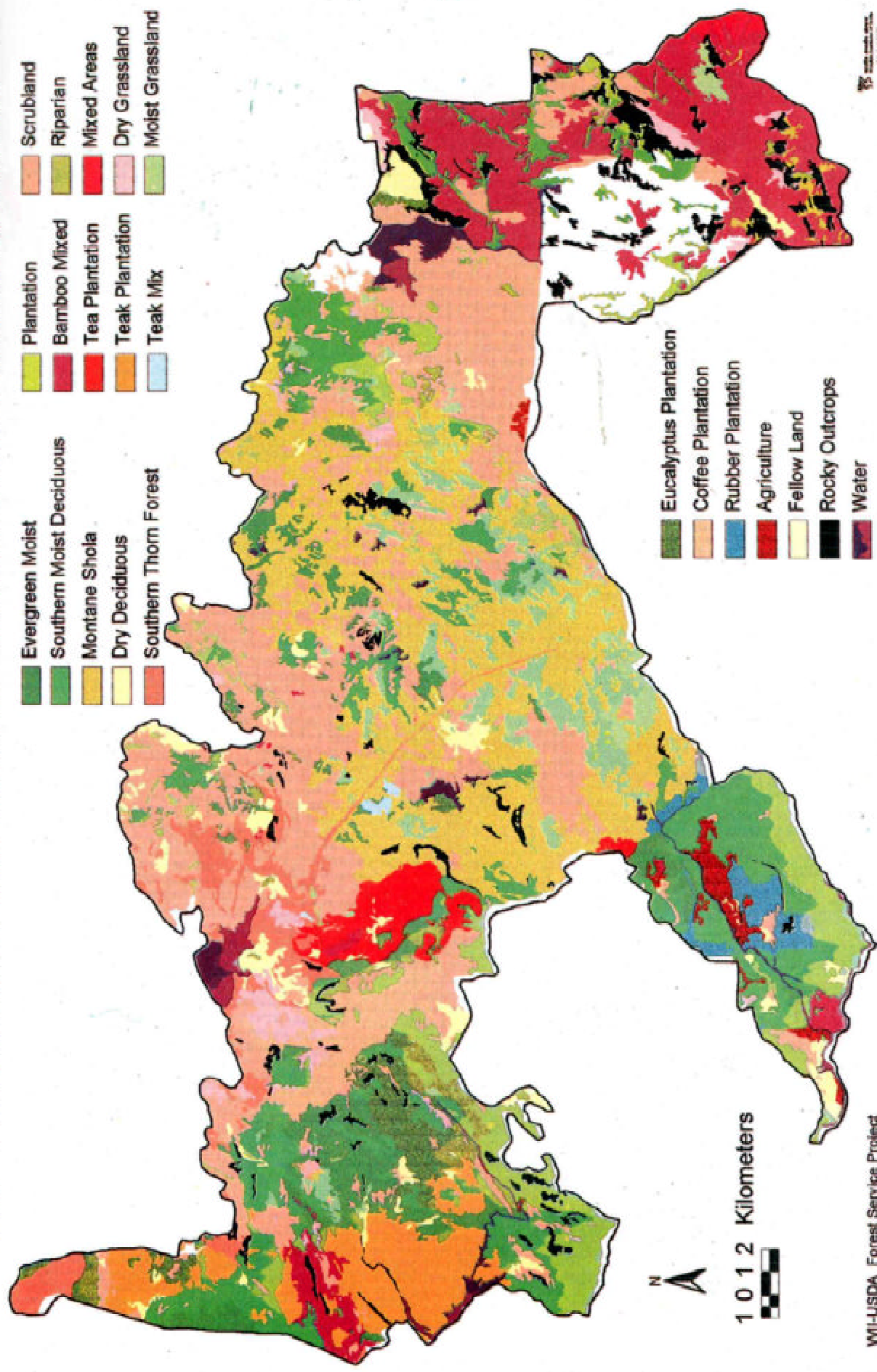


Plate - 4 Vegetation map of Indira Gandhi WLS - Anaimalai Conservation Area (ACA), Tamil Nadu

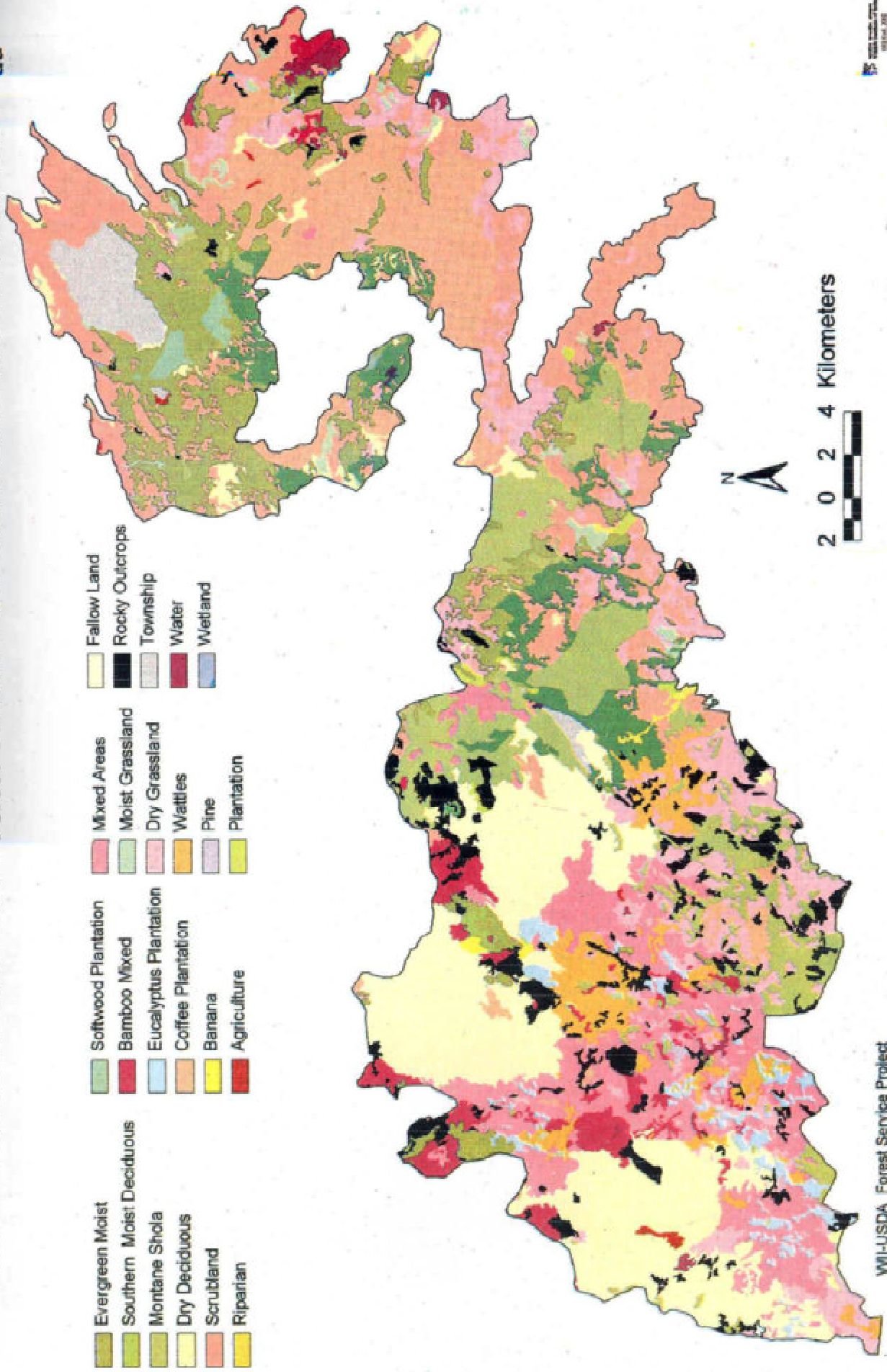


10 1 2 Kilometers

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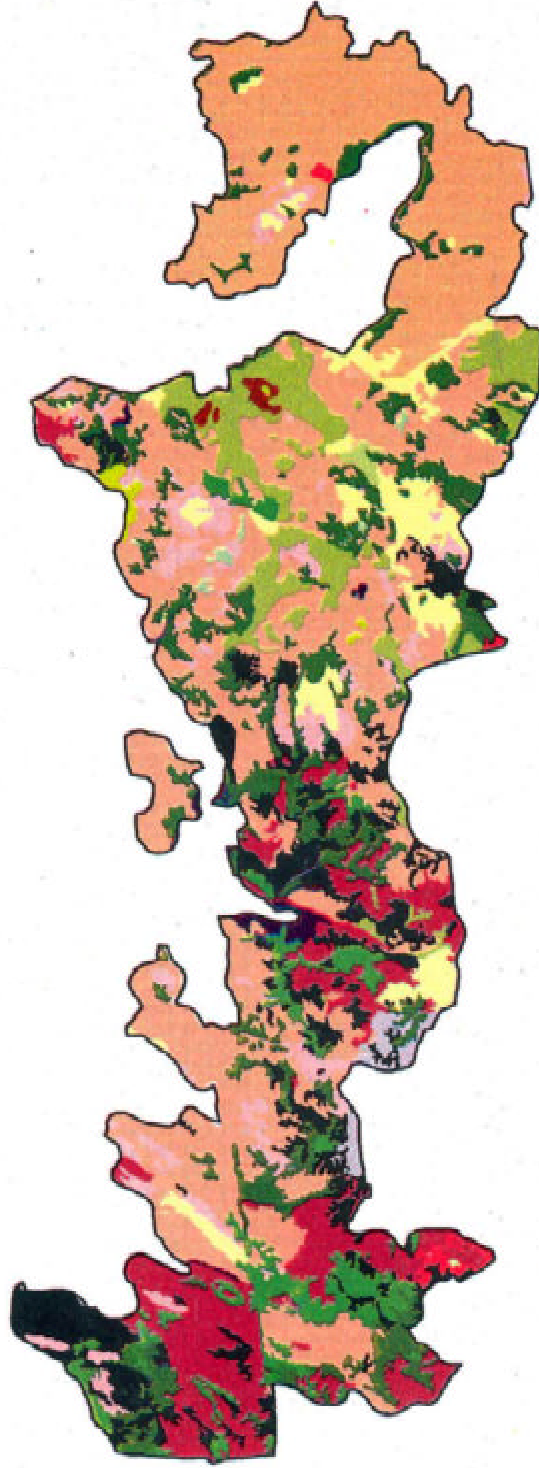
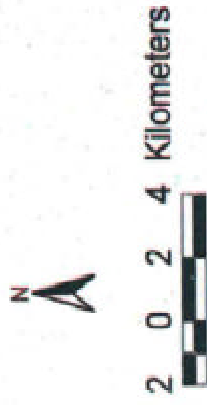
Plate - 5 Vegetation map of Dindigul Forest Division - Anaimalai Conservation Area (ACA), Tamil Nadu



WII-USDA Forest Service Project



Plate - 6 Vegetation map of Kodaikanal Forest Division - Anaimalai Conservation Area (ACA), Tamil Nadu



















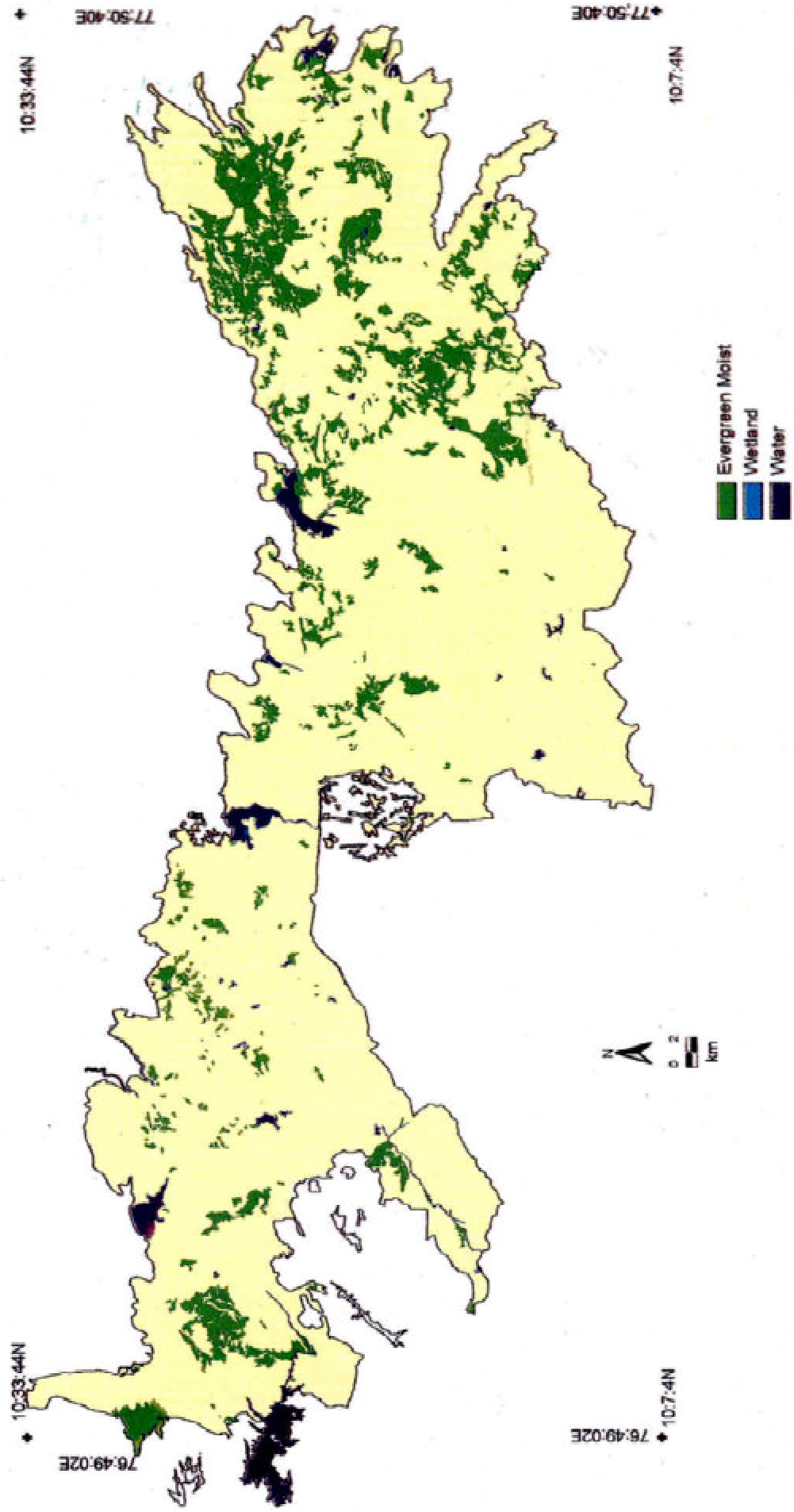
- | | | | |
|---|-------------------|---|--------------------------|
|  | Dry Grassland |  | Evergreen Moist |
|  | Moist Grassland |  | Southern Moist Deciduous |
|  | Wattles |  | Montane Shola |
|  | Plantation |  | Dry Deciduous |
|  | Bamboo Mixed |  | Scrubland |
|  | Coffee Plantation |  | Mixed Areas |
|  | Rocky Outcrops |  | Agriculture |
|  | Water |  | Fallow Land |

Plate - 7 Evergreen forest - Anaimalai Conservation Area (ACA), Tamil Nadu



it. All the species are of the evergreen type. *Ternstroemiaceae* are well represented and *Eugenias* are important together with *Meliosma*, *Eurya*, *Symplocos*, and *Lauraceae*. Magnoliaceae are represented with such genera as *Ilex* and *Euonymus*. *Rhododendron nilgiricum* is as common and conspicuous as in Himalayas and *Ericaceae* are represented by *Gaultheria* and *Vaccinium*. **(Plate 8- ACA Montane Shola & Moist Grassland Vegetation map).**

IIA/C2 West Coast Semi-Evergreen Forests

This type is intermediate between eastern tropical evergreen forest and moist deciduous forest with evergreen and deciduous dominants usually intimately mixed with *Xylia*. The lower canopy is mainly evergreen foliage. *Bambusa arundinacea* is the typical bamboo. This is commonly seen as a small narrow strip between the evergreen and moist deciduous forest, mostly on hilltops between 450-1050 meters, which is often destroyed even by small disturbances. Rainfall varies between 2,000 to 2,500 mm locally much more. The main floristics of this type of forests are *Artocarpus hirsuta*, *Salmlia malabarica*, *Vitex altissima*, *Tetrameles nudiflora*, *Acrocarpus fraxinifolius*, *Hopea parviflora*, *Lagestromia lanceolata*, *Vateria indica*, *Anthocephalus cadamba*, *Xylia xylocarpa*, *Terminalia tomentosa*, *Cedrella toona*, *Grewia tiliaefolia*, *Dalbergia latifolia*, *Pterospermum rubiginosa*, *Radermachera xylocarpa*, *Mesua ferrea*, *Adina cordifolia*, *Holoptelia integrifolia*, *Pterocarpus marsupium*, and *Sterculia guttata*.

IIA/DS1 Southern Montane Wet Scrub

This type of forest is seen in the neighbourhood of the Kodaikanal and a considerable area in Palani Hills. It is a kind of evergreen scrub that includes herbaceous, shrubby and arborescent evergreen species. It is a degraded type of forest of the original Southern wet temperate forest (IIA/C1) where low evergreen scrub of varying density, often with bracken fern and seedlings of stunted shola species (notably *Rhododendron* and *Syzgium arnotianum*, *Vaccinium*

nilgherrense) are also found. The main species within this type are *Rhodomyrtus tomentosa*, *Hypericum mysorense*, *Wendlandia notoniana*, *Mahonia leschnaultii*, *Berberis tinctoria*, *Rubus sp.*, *Strobilanthus sp.*, and *Pteridium aquilinus*. There is indication that this type of forest can regain the original Shola status provided enough protection is given.

IIA /C1/DS₂ Southern Montane Wet Grass Lands

This type of the vegetation is seen at an elevation range of 1200m and above. The soil of this grass-bearing area is of black peaty structure, which absorbs and retains certain moisture. In certain areas bracken moss covers the growth completely. Grasses like *Thamedia triandra*, *Ischemum pilosum*, *Thamedia cymbaria*, *Cymbopogon polynuora*, *Bothrichloa pertusa*, *Tripogon bromoides*, *Ergrostris nigra* occur in this type. Associated plants of this type include *Lobalia nicotinifolia*, *Leucas suffruticosa*, *Anaphalis lawii*, and *Fimbristylis sp.*

This grassland type has aroused a lot of controversy over its status as climax or degraded stage. Different authors give different views. One school is of the opinion that these grassland systems are in a highly degraded stage of the previously existing Evergreen forest (Champion and Seth preliminary forest survey report) that degraded due to several ecological and anthropological factors to its present state. Some authors believe it is a climax stage. Mr. Ranganathan in his Working Plan (1938-48) for the Nilgiris Division holds the view that Shola is the climatic climax as evidenced by the study of the altitudinal zonation of forests on the outer slopes. Jayadev, who wrote the working plan for the Nilgiris in 1954 believes that Champion's view is acceptable to the extent that it is not the climatic climax of the region. He believes that it is not secondary to a previously existed forest climax and that grass had occupied all the earlier cleared patches. This is borne out by the actual conditions that prevailed and are still prevailing in the region.

The grass areas cannot be considered as the sub-climax stage to any of the forest type existing in this region since it is not developing in to a climax forest or does not even show any change towards that direction, in the areas where the disturbance is not prevalent or nil. Tyagarajan in his Working Plan for the Nilgiris is of the opinion that sholas are relicts of some other type of vegetation that remained prevalent in this region, sometimes in the past. He also classifies the Grassland as Climax, Pre-climax and sub-climax types. Mr. Karunakaran in his Working Plan for the Nilgiris concludes this as a degraded stage due to climatic and anthropological factors. Mr Sulaiman, (1984-86, 1994-96) in his Working plan for the Madurai expresses the belief that both the types of vegetation can co-exist and evolve as climax adjacent to one another. A study in the peat bogs of Montane Nilgiris by Sukumar *et al* (1993) shows a drift of C3 Vegetation (C3 Forests /Grassland) towards C4 Vegetation (Grasslands), during 6000 –3500 years BP, due to lower rainfall and lower CO₂ levels. Predominance of C4 Vegetation reflects arid conditions and that of C3Vegetation reflects moist conditions. **(Plate9- ACA Grasslands Vegetation map).**

IIB/E3 Southern Moist Bamboo Brakes

These occur as tall clumped bamboos with an occasional strand of trees in moist deciduous forest. The natural occurrence of brakes depends on soil conditions and they prefer stream and river courses, shady slopes and sheltered localities. They are seen in all types of other forest types if similar conditions are available throughout an altitudinal range of 300-900m within ACA. **(Plate 10- ACA Riparian Forest Vegetation map).**

II S/3 Dry Savannah Forests

These occur along the rocky and shallow ridges up to an elevation of 1200 meters. Their distribution is mainly along the outer areas of the ACA. The main floristics of this type of forests include *Anogeissus latifolia*, *Buchnanaia langes*, *Cassia fistula*, *Cymbopogon*

flexosus, *Cassia auriculiformis*, *Cochlospermum religiosum*, *Diospiros melanoxyton*, *Givotia rotteleriformis*, *Embilica officinalis*, *Phoenix acaulis*, *Pterocarpus marsupium*, *Randia domentorym*, *Shorea talura*, and *Terminalia chebula*.

IIIA/C_{1/2}S1/ Sub group3B South Indian Moist Deciduous Forests

The chief feature of the Moist deciduous forests is a leafless period in the dry season when the upper canopy is almost entirely leafless though the lower and middle canopies are sprinkled with evergreen shrub and small trees of medium size. This type is a closed high forest where the dominant tree species often attain a height of 35-40meters. The lower storey of the forest is mostly evergreen thus giving the forest an evergreen appearance throughout the year. The main floristics of this type includes *Terminalia tomentosa*, *Cedrella toona*, *Grewia tilaefolia*, *Dalbergia latifolia*, *Pterospermum rubiginosa*, *Lagestromia lanceolata*, *Vateria indica*, *Anthocephalus cadamba*, *Radermachera xylocarpa*, *Adina cordifolia*, *Holoptelia integrifolia*, *Pterocarpus marsupium* and *Sterculia guttata*. **(Plate11- ACA Southern Moist Deciduous Forest Vegetation map)**

V A/ C1. Southern Cutch Thorn Forest

This type of forests occur along the foothills of the ACA, towards the eastern side where the rainfall is mainly from the NE Monsoon, with annual rainfall varying between 900mm 1,250mm. The climates in these regions are quite dry during the long summers and rains are of very short spell.

The dominant species of this type of forest include *Albizzia amara*, *Acacia feruginea*, *Acalypha fruticosa*, *Acacia instia*, *Acacia lucophloea*, *Acacia astrinum*, *Atlantia monophylla*, *Acacia nilotica*, *Acacia pennata*, *Cassia auriculiformes*, *Commiphora berryi*, *Cenchrus ciliaris*, *Calotropis gigantea*, *Cassia carandas*, *Cardiospermum sp.* *Crataeva religiosa*, *Cissus quadrangularis*, *Capparis zeylanica*, *Dodonia viscosa*, and

Plate - 8 Montane Shola and Moist Grassland - Anaimalai Conservation Area (ACA), Tamil Nadu

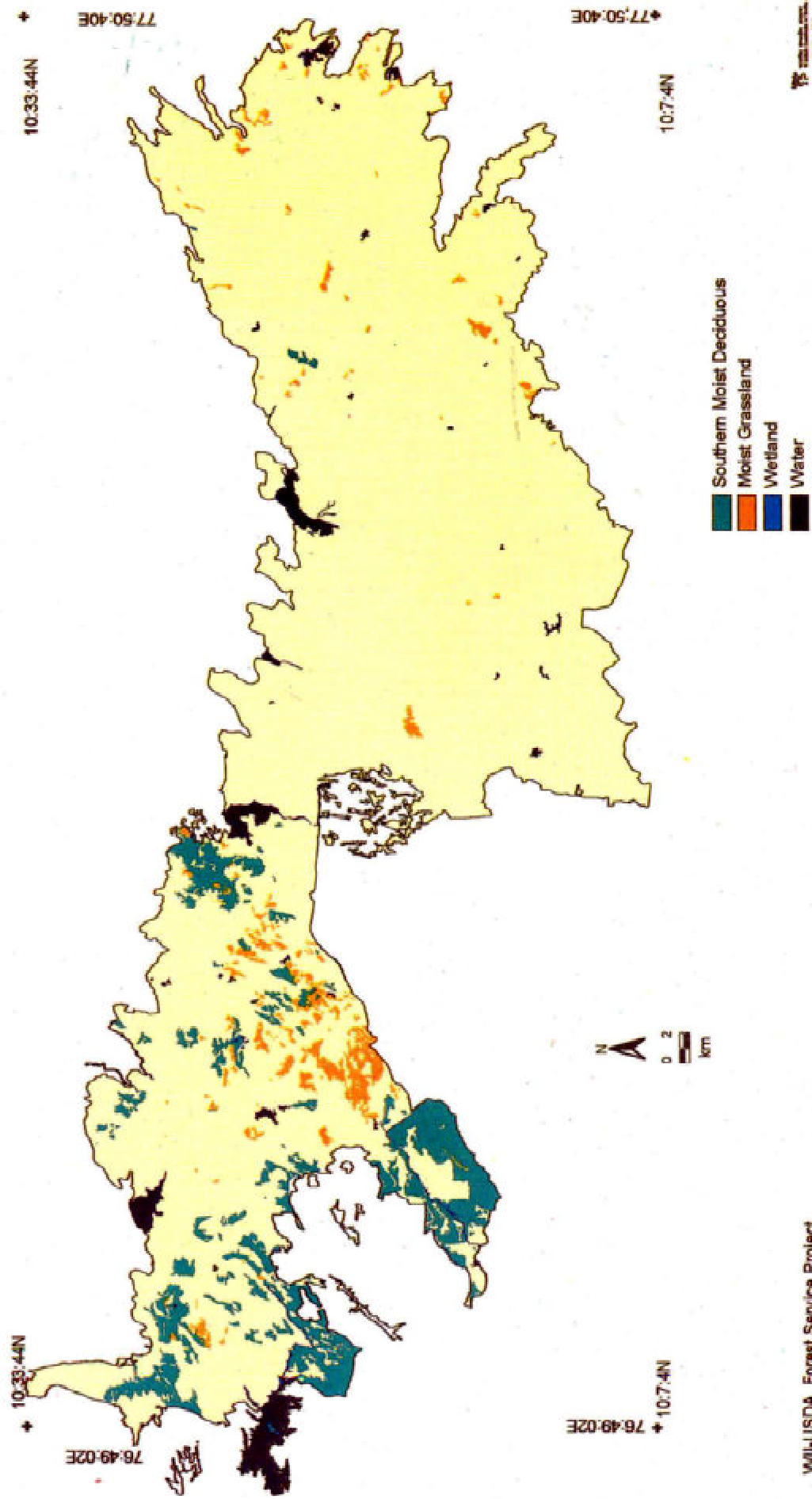


Plate - 9 Grasslands - Anaimalai Conservation Area (ACA), Tamil Nadu

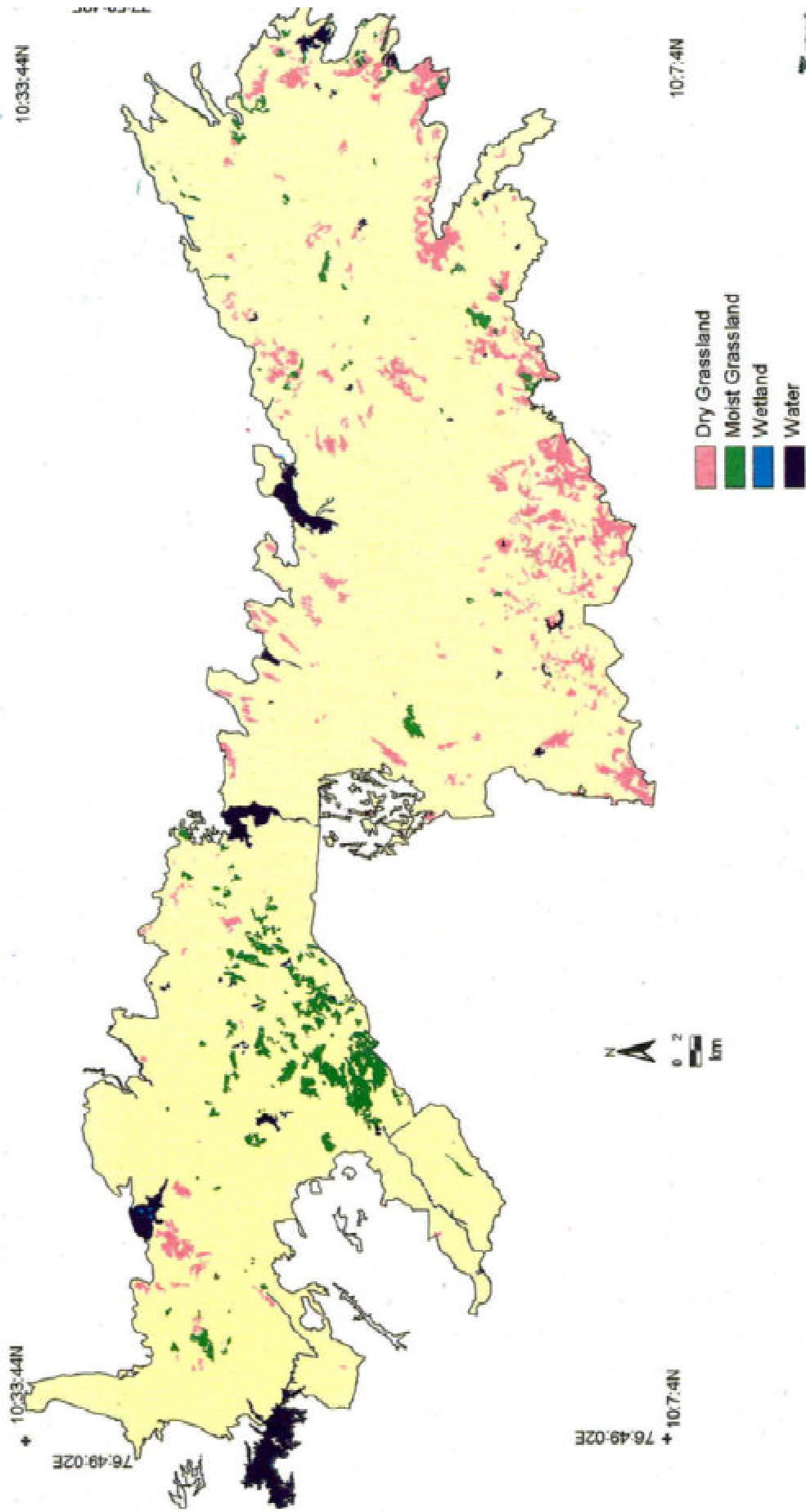


Plate - 10 Riparian forest - Anaimalai Conservation Area (ACA), Tamil Nadu

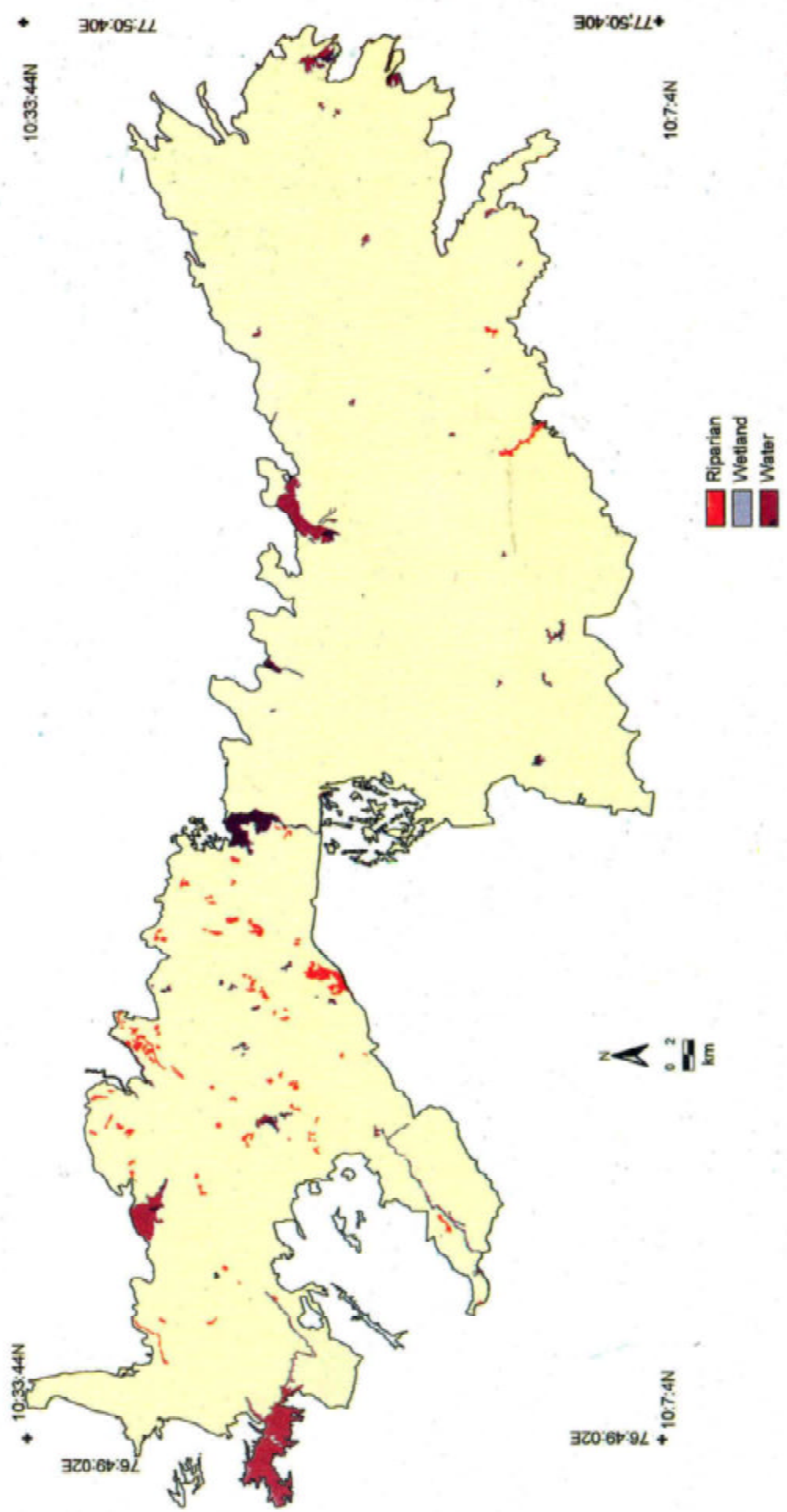
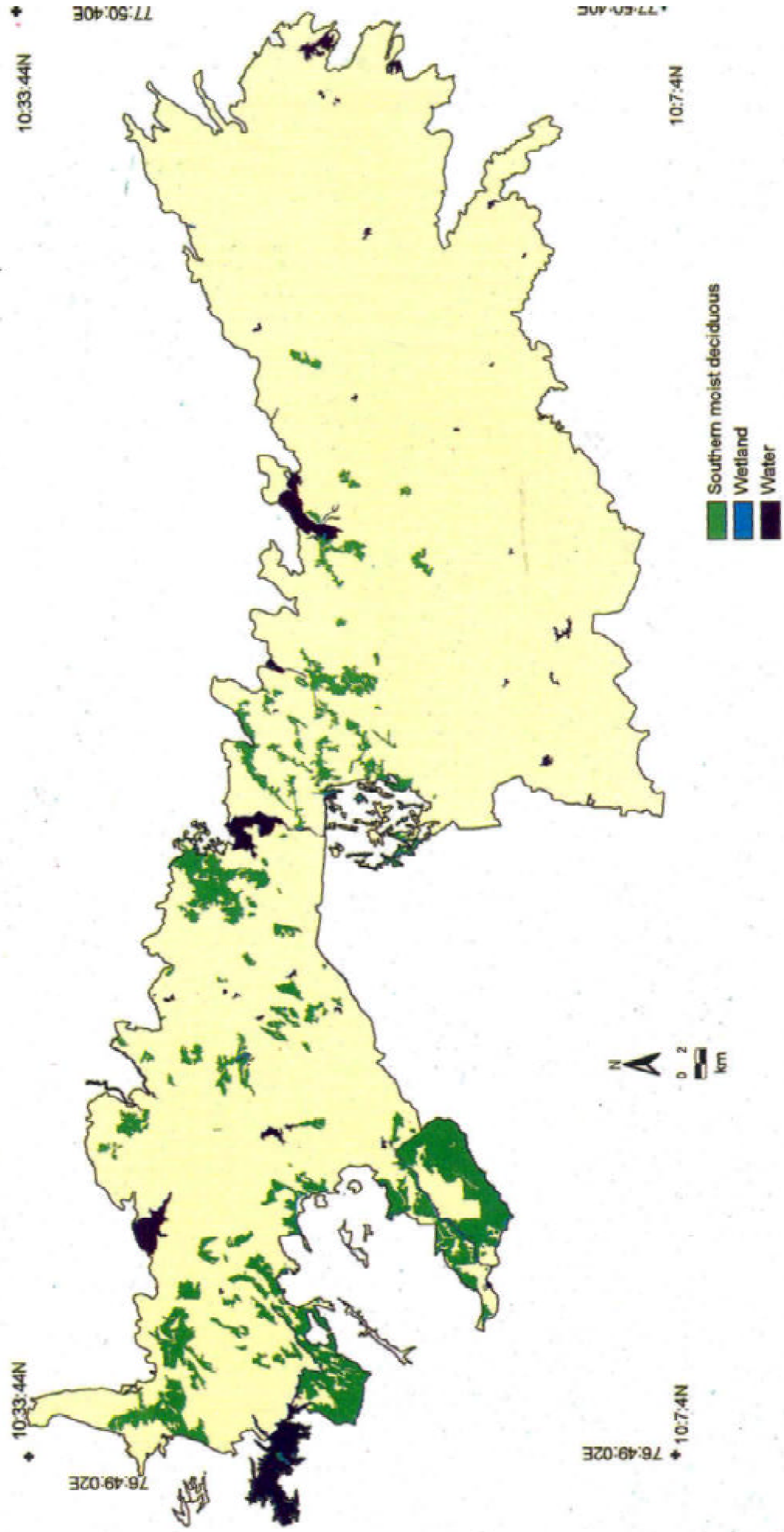


Plate - 11 Southern moist deciduous forest - Anaimalai Conservation Area (ACA), Tamil Nadu



Euphorbia antiquorum. (**Plate 12- ACA Southern Thorn Forest Vegetation map**).

VA/C Southern Tropical Dry Deciduous Teak Forest

This type is seen along the medium elevations up to 300-1000 meters. The species associations of this type and the Moist Deciduous type are almost the same, but the trees here will not attain a height more than 20-25 meters. The main variation is caused by the rainfall patterns, which are quite varied along the different altitudes. These types of forests are seen in places where the rainfall varies from 1000mm to 1500mm in ACA. The main floristics of this forest type includes *Albizia lebbek*, *Acacia instia Anogeissus latifolia*, *Albizia odoratissima*, *Abrus precatorius*, *Azadirachta indica*, *Bambusa arundinaceae*, *Bombax malabaricum*, *Bridelia retusa*, *Bauhinia sp.*, *Coriarea religiosa*, *Dalbergia latifolia*, *Dendrocalamus strictus*, *Helicteres isora*, *Lantana camara*, *Lamnea grandis*, *Morinda tinctoria*, *Pterocarpus marsupium*, *Pterolobium indicum*, *Strobilus asper*, *Sapindus emarginatus*, *Terminalia chebula*, *Terminalia tomentosa*, *Terminalia bellerica*, and *Wrightia tinctoria*. (**Plate 13- ACA Southern Dry Deciduous Forest Vegetation map**).

VA/C3 Southern Dry Mixed Deciduous Forests

These forest types are found in between the elevations of 600-800 meters with the precipitation varying from 800mm to 1000mm. It is common in the Perumpallam range of Kodaikanal, Ulandy and Udumalpet ranges of Anaimalai Sanctuary. They are common to the shallow soils of undulating hills and rocky sides. Entire plants seen in this type of forests are of deciduous type. Bamboo, if present, are of very poor quality. Thorny plants are commonly seen and increases in the area of heavy grazing pressures. Mostly these forests are seen along the external boundary of the ACA. Floristics include *Albizia amara*, *Acacia feruginea*, *Acacia lucophloea*, *Anaogeissus latifolia*, *Atlantia monophylla*, *Cassia fistula*, *Cassia marginata*,

Cochlospermum religiosum, *Chloroxylon swetenia*, *Canthium daiburnum*, *Wrightia tinctoria*, *Hemicyclea sepiaria*, *Morinda tinctoria*, *Harwickia binata*, *Protium caudatum*, *Limonia acidissima*, *Tamarindus indica*, *Givotia rotteleriformis*, *Terminalia chebula*, *T. bellerica*, *T. tomentosa*, *Dalbergia paniculata*, *Helecteris isora*, *Lagestromia parviflora*, *Aegle marmelos*, and *Santalum album*. Very scattered bamboos of *Dendrocalamus strictus* are also seen in this type of forest. (**Plate 14- ACA Southern Dry Mixed Forest Vegetation map**).

VIIIA/C₁ Nilgiri Subtropical Evergreen Forest

This has been described as the “stunted rain forest”, similar to tropical rain forest but not so luxuriant; trees being smaller and with less shapely boles and often festooned with herbaceous cryptogamic epiphytes. A dense under growth of *Strobilanthes*, etc. is frequently present. It is commonly present in the Upper Palani hills and Anaimalai hills at an altitudinal range of 1200-1750m. The rainfall varies from 2,000mm to 5,000mm in these areas. The main floristics of this type are *Calophyllum elatum*, *Actinodaphne hookeri*, *Litsea stocksii*, *Cinnamomum sulphuratum*, *Canthium diocum*, *Eugenia sp.*, *Rhododendron nilgiricum*, *Gaultheria frangitissima*, *Strobilanthes sp.*, etc..

Forest Plantations :

The main plantations in this category are –

Teak Plantations

These were plantations found both in medium and lower elevations replacing mostly the moist deciduous, dry deciduous forests and small amounts of the middle elevation evergreen forests also.

Eucalyptus Plantations

These plantation types are found mainly in the lower elevation areas with a very low rainfall. They mainly replace the dry deciduous forests of lower and medium elevation in the ACA.

The South India Viscose Ltd. is a company set up to produce high quality rayon yarn and stable fibre using Wattle and Blue Gum from Palani Hills. Blue Gum is preferred to the Wattle wood and the company's requirements are mainly met by the Kodaikanal Division. The annual felling requirements are c 500 hectares of Wattle and 400 hectares of Blue gum for the Company, being met in part by the Reserve forests outside the ACA also.

Wattle Plantations

These are also high elevation plantations that replace the montane shola forest and grassland systems in the higher elevations. Several companies, notably *Tan India Wattle Extracts Company* are dependent on these plantations for their raw material. The primary raw material is wattle bark produced by the Palanis and Nilgiris. Partial requirements of the company are met by the Palanis where 800-1,000 hectares of wattle plantation are exploited per year.

Pinus Plantations

These are also high elevation plantation type mainly seen in the high mountainous region of the Kodaikanal and Anaimalai areas. This also replaces the montane shola grassland systems in the higher elevations.

Tamarind plantations

These are seen mainly in the Dindigul Division. This replaces the dry deciduous forest types as well as the thorn forests of the lower elevations. **(Plate 15- ACA Forest Plantations map)**

Commercial Plantation :

Tea Coffee and Cardamom Plantations

The tea is an important plantation in the ACA, especially in the higher altitudes. It is common along the higher elevations particularly in disreserved forests of the Valparai taluk. A considerable amount of

evergreen forest had been cleared for this purpose. **(Plate 16- ACA Commercial Plantation map).**

Methods for Vegetation Study

The vegetation is studied using Circular Plot Method. The concentric circular plots of different radii were laid along a selected tract of vegetation. Twenty-meter circular plots were used for tree, five meter for the shrubs and two meter for herbs and one meter for the grasses.

In 20-meter radius plots, trees were counted species-wise and Girth at Breast Height (GBH) of each individual was measured. In five-meter plots, the shrubs were counted species-wise. The same procedure was adopted in two-meter and one meter plots for herbs and grasses respectively.

The tree plot data were analyzed to find out the diversity, density, abundance, Basal area and Important Value Index (IVI) of different species. The shrub and herb data were analyzed to find out the density of individuals/ha and diversity. **(Fig 2.3 & Fig 2.4)**

Fig 2.3 : Placement of points along the transects for the vegetation study

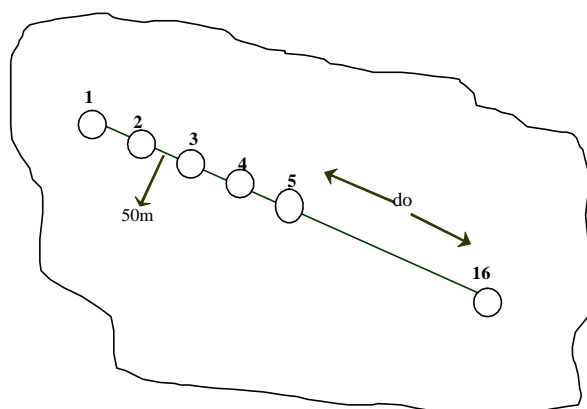
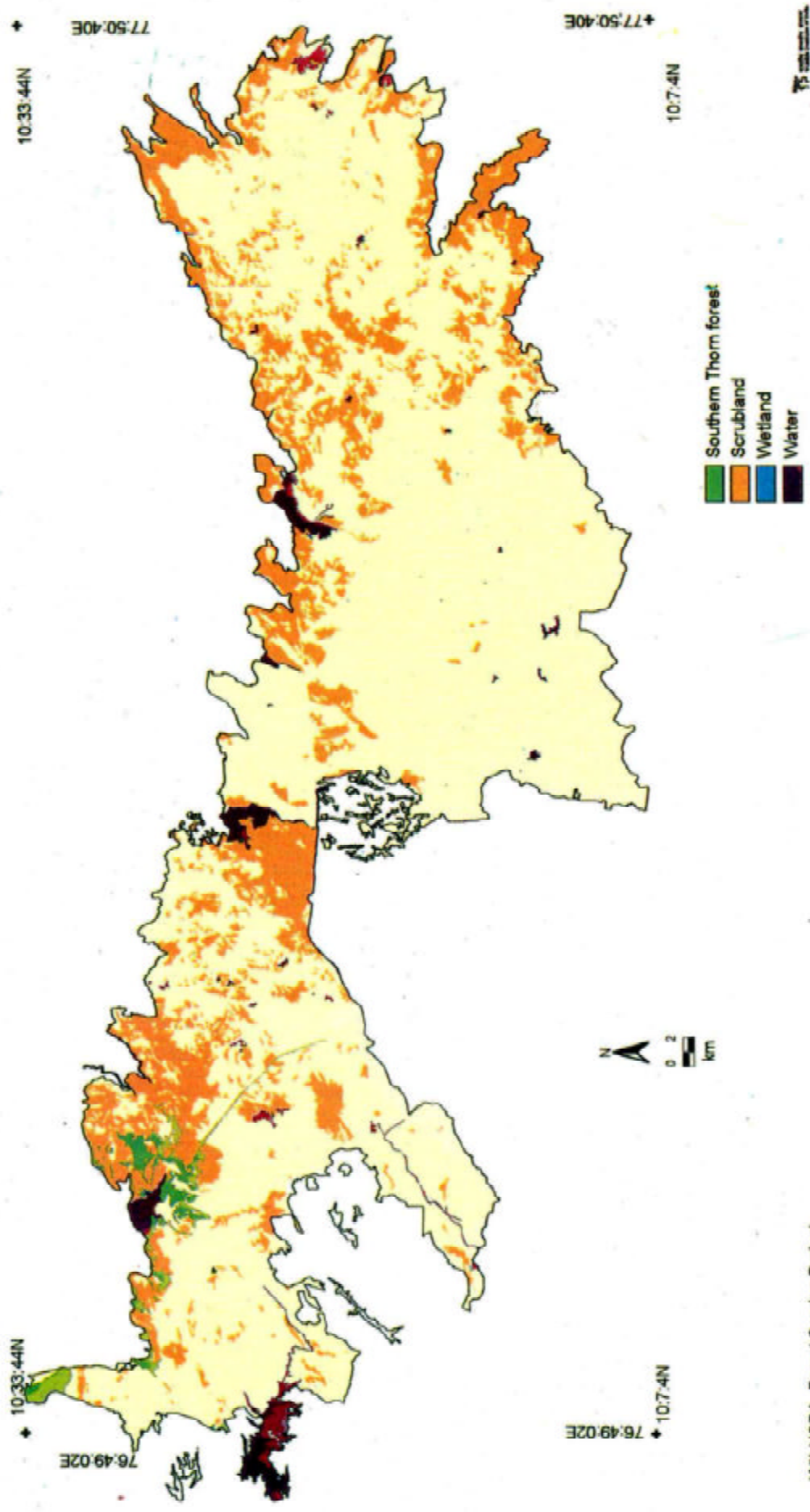


Plate - 12 Southern thorn forest - Anaimalai Conservation Area (ACA), Tamil Nadu



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Plate - 13 Southern dry deciduous forest - Anaimalai Conservation Area (ACA), Tamil Nadu

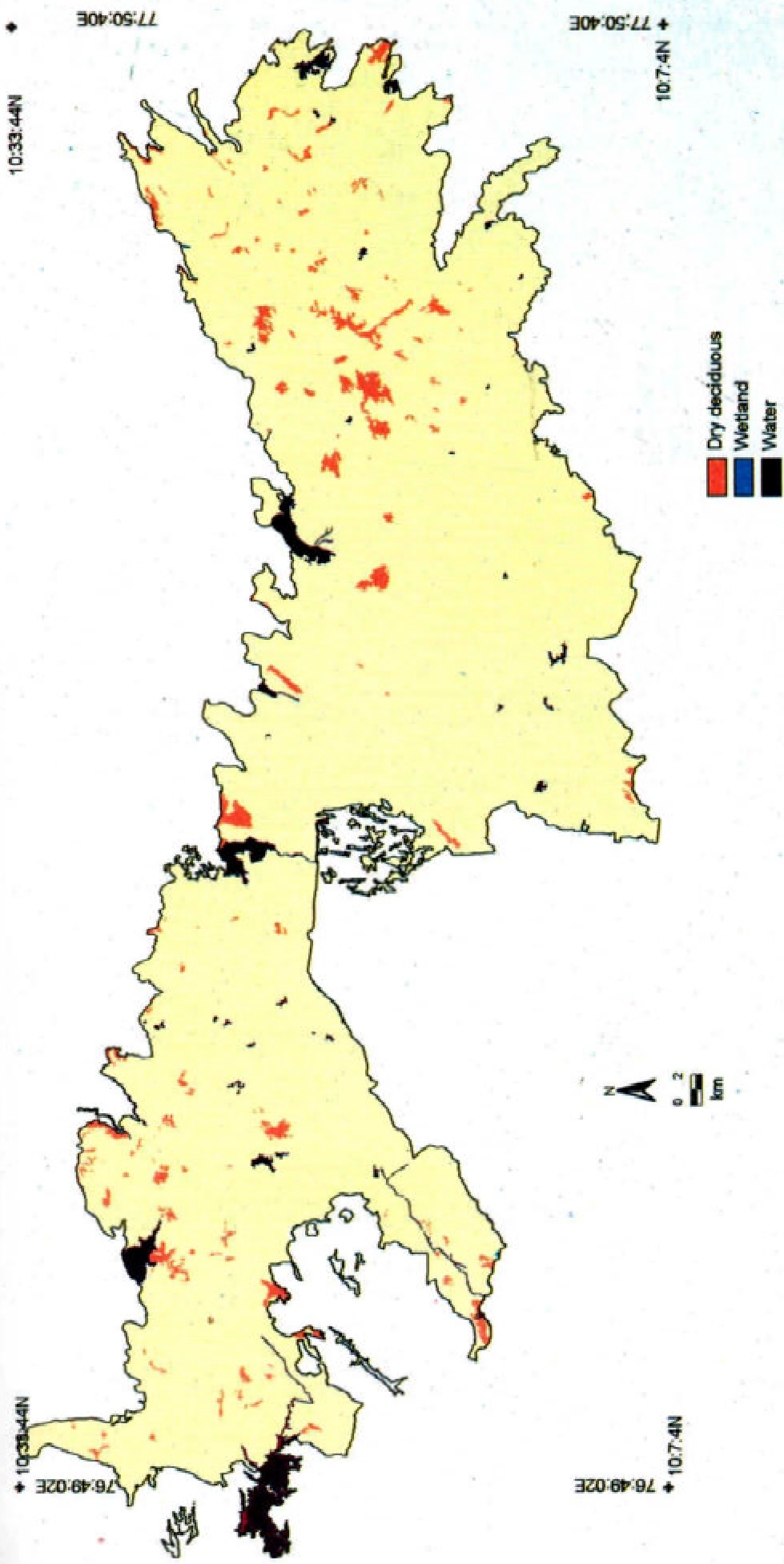


Plate - 14 Southern dry deciduous forest including related Plantations - Anaimalai Conservation Area (ACA), Tamil Nadu

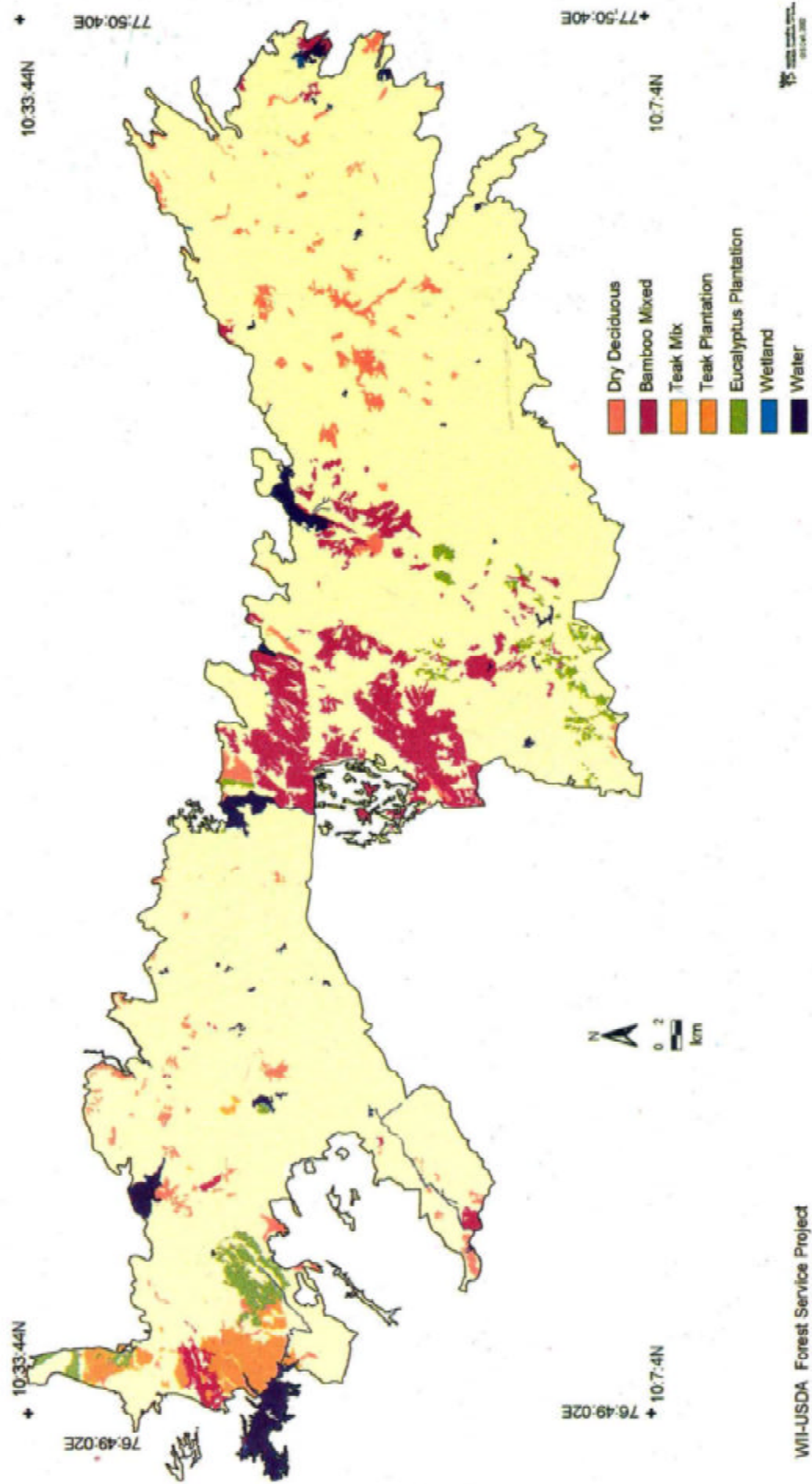


Plate - 15 Forest Plantations - Anaimalai Conservation Area (ACA), Tamil Nadu

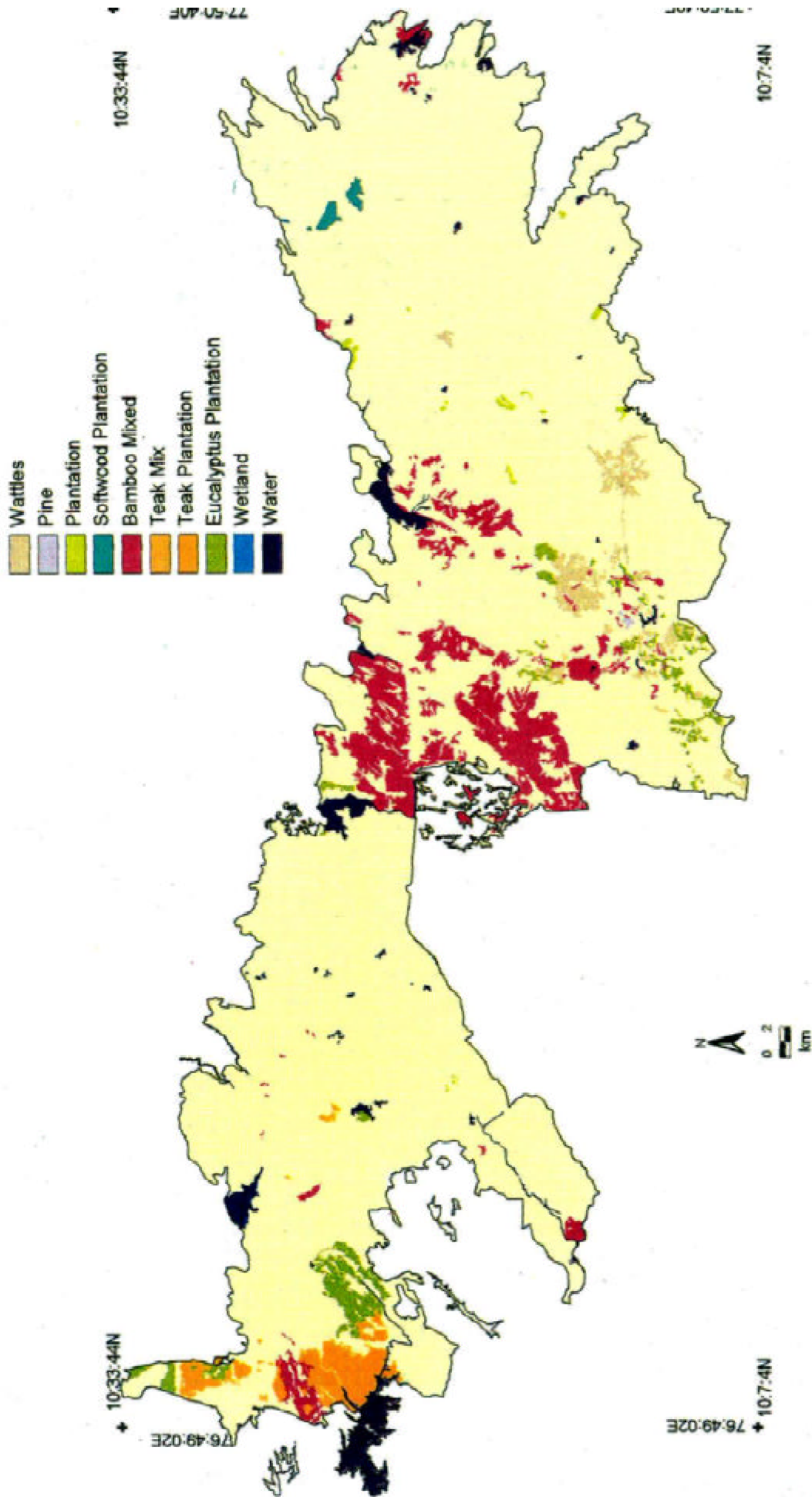


Plate - 16 Commercial Plantation - Anaimalai Conservation Area (ACA), Tamil Nadu

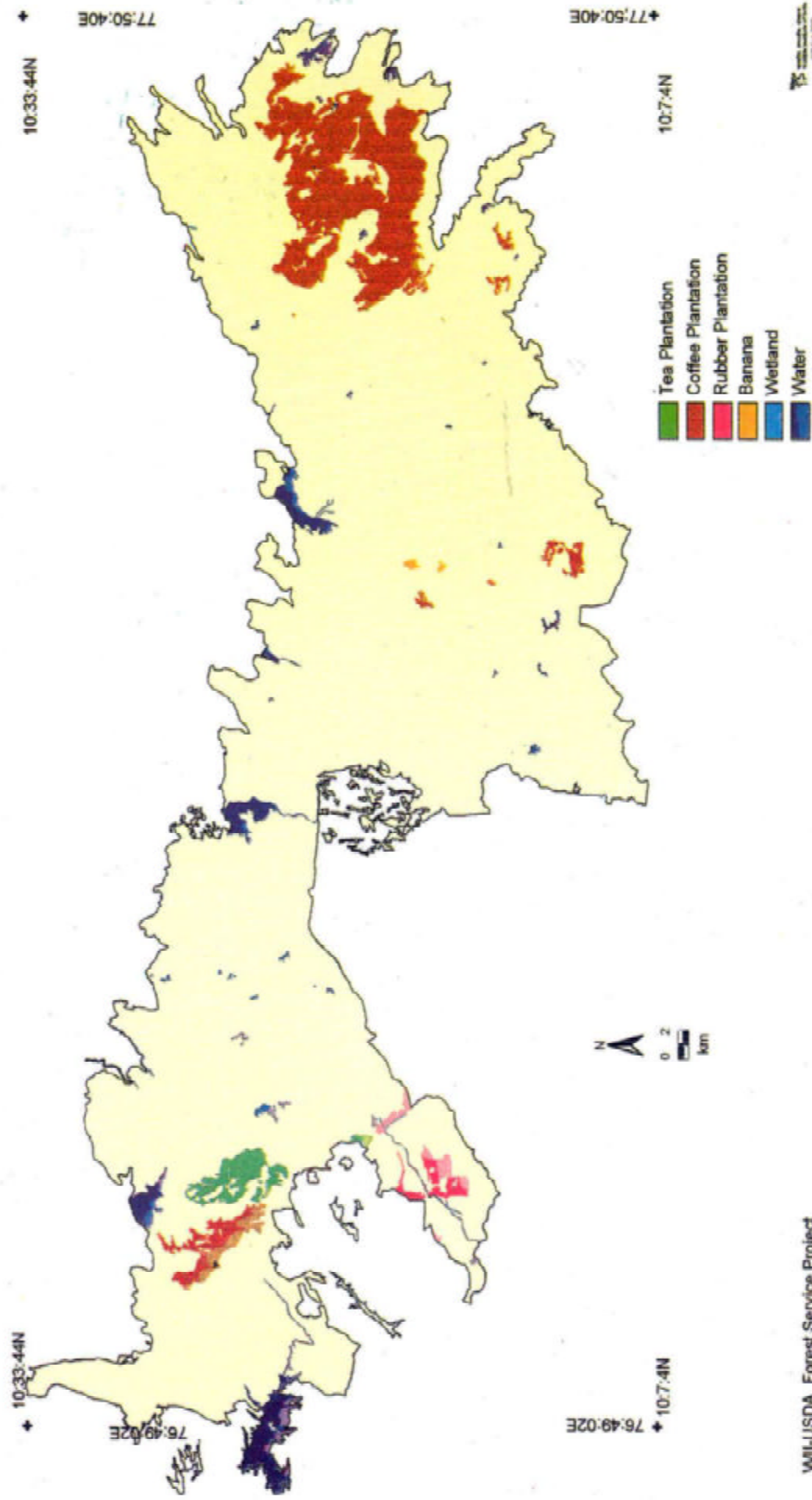
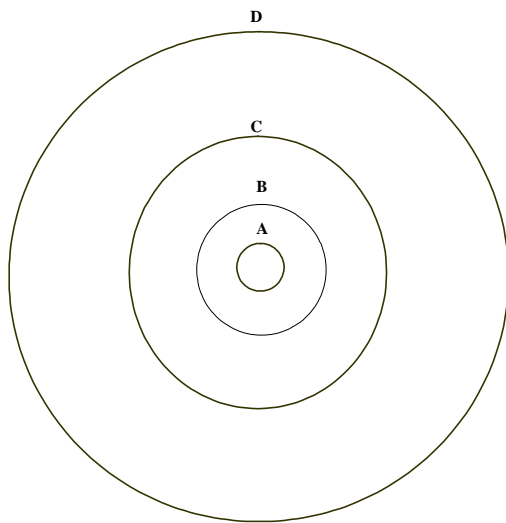


Fig. 2.4 :Concentric Plots for the Estimation of vegetation and pellets of herbivores



A = 1m for Grass & herbs
 B= 2m for saplings & Shrub
 C = 5m for shrubs & Pellets
 D = 20m for trees

Five-meter circular plots were used in all the vegetation types to estimate the habitat use of large mammals of the area using Pellet Count method. The pellet groups of animals like Sambar, Spotted Deer, Barking Deer, Mouse Deer and dung piles of Guar, Elephant and the scats of Sloth Bear were counted along the plots to find out the Habitat Use Index of different animals in respective vegetation types.

Line transects and Point Count methods were applied in all the vegetation types of the Protected Area to study the changes in the avian communities along with the changes in the vegetation characteristics.

The vegetation data for Montane Shola, Moist Deciduous, Dry Deciduous, Coffee Plantation and Teak Plantations were analyzed to see the results. The shrub diversity index shows a very high value for the Young Teak Plantation (25years of age), followed by the Montane Shola and Dry deciduous Forest types (Fig. 2.5). A very high diversity may be due to

openings in the canopy, total deciduous nature of the monoculture and total absence of the tending operations for the last 10-12 years of time. The density of shrubs also was high in the Young Teak Plantations (Table-2.3).

Fig. 2.5 shrub diversity indices (Hills) of different forest types

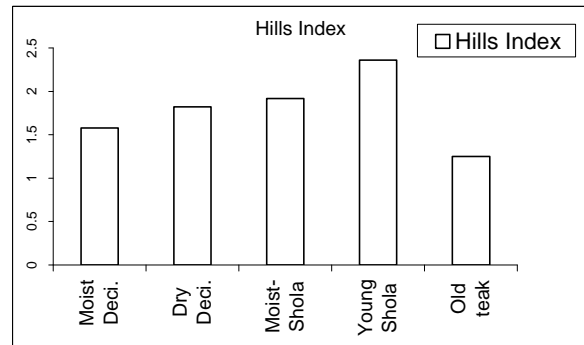


Table 2.3: Number of Species & Density / ha of trees and shrubs in different vegetation types

Habitat	Trees		Shrubs	
	Species	Density /ha	Species	Density /ha
Montane Shola	**	**	17	12930
Moist Deciduous	64	5955	14	14761
Dry Deciduous	12	4562	14	14306
Young Teak	13	2309	23	29610
Old Teak	7	2142	11	14236
Coffee	10	1003	Nil	Nil
Grassland	Nil	Nil	Nil	Nil

The tree density was highest in the Moist Deciduous Forest type (Table-2.3) where as shrub density was only second to the Young Teak. As expected the tree density shows a decreasing trend from Moist

Deciduous, Dry Deciduous Forest types and Young Teak, Coffee and Old Teak Plantations (Table-2.3). The extreme diversity of the tree species and difficulties in the field identification of different species of trees in Montane Shola and Evergreen Forest types were the definite impediments in the work.

An analysis of species-wise density, Basal Area, and Important Value Index (IVI) of different tree species gave very interesting trends in different vegetation types. Moist Deciduous Forest was dominated by the *Lagerstroemia microcarpa*, a very large sized deciduous tree, followed by a small-medium sized *Strombosia ceylanica* and *Polyalthia sp.*, which ranked third in IVI value. Basal Area was highest for the *Lagerstroemia*

microcarpa followed by the *Polyalthia sp.* in the Moist Deciduous Forest (Table-2.4).

In the Dry Deciduous Forest, *Randia dumetorium*, a small sized thorny tree excelled all other tree species in IVI index virtually due to the high number of individuals/ha. *Lagerstroemia microcarpa* and *Terminalia paniculata* followed by *Tectona grandis* and *Anogeissus latifolia* ranked 2nd, 3rd, 4th and 5th respectively. In density, *Anogeissus latifolia* is much higher than Teak but has a lesser basal area (Table-2.5). The very high numbers of the *Randia dumetorium* may be due to the very high disturbance factor in this particular area due to the nearness to the Elephant camp and Topslip settlement.

Table 2.4: Basal Area, Abundance, Dominance, IVI & Density/ha of important species from Moist Deciduous Forest

Plant Species	BA	Abun.	Domi.	IVI	Rank	D/ha
<i>Lagerstroemia microcarpa</i>	11.06	3.34	19.31	22.65	1	199.04
<i>Strombosia ceylanica</i>	3.32	12.03	5.79	17.82	2	716.56
<i>Polyalthia sp.</i>	4.27	6.42	7.45	13.87	3	382.17
<i>Bischofia javanica</i>	3.60	3.07	6.29	9.36	5	183.12

Table 2.5: Basal Area, Abundance, Dominance, IVI & Density/ha of important species from Dry Deciduous Forest

Plant Species	BA	Abun.	Domi.	IVI	Rank	D/ha
<i>Randia dumetorium</i>	1.93	32.81	3.06	35.87	1	1496.82
<i>Lagerstroemia microcarpa</i>	10.05	17.98	15.94	33.91	2	820.06
<i>Terminalia paniculata</i>	11.03	10.821	7.48	28.30	3	493.63
<i>Tectona grandis</i>	9.54	4.01	15.13	19.15	4	183.12
<i>Anogeissus latifolia</i>	5.61	10.12	8.90	19.02	5	461.78

In Young Teak Plantations, Teak dominated with a very high IVI value of 153.2, where as the second dominant *Terminalia paniculata* had the value of only 17.28 (Table-2.6). During the tending operations, the saplings of the other species of trees were removed thus facilitating the growth of the teak. This can be the reason for the extreme variation in the values of Basal Area and IVI. *Terminalia paniculata* was followed by the *Lagerstroemia microcarpa* and *Dalbergia latifolia*. The very high density of teak in Young teak plantations (1759 individuals/ha, Table-2.6) in comparison with that of Old Teak Plantations (112 individuals/ha, Table-2.7) can be attributed to the different tending operations rendered to Old Teak Plantation for almost 60 years, where as the removal of unhealthy trees and other

selection felling operations were carried out to improve the timber quality. In Young Teak Plantations, which is only 25 years of age and not subjected to any tending operations or removal of unhealthy trees, the number of individuals are very high per unit area. Even in other species, only *Lagerstroemia microcarpa* was probably allowed to grow due to its good timber yield in Old Teak Plantations. It is notable that the other species are coming up well in the young teak plantations, where the tending operations were stopped for the past twelve years. This shows that if left alone the natural species can gain over the teak and thus bring back almost natural forest appearance back, provided enough gaps are there in the Teak Plantations and the teak plants are of younger age.

Table 2.6: Basal Area, Abundance, Dominance, IVI & Density/ha of important species from Young Teak Plantations

Plant Species	BA	Abun.	Domi.	IVI	Rank	D/ha
<i>Tectona grandis</i>	17.77	76.21	77.01	153.21	1	1759.55
<i>Terminalia paniculata</i>	2.24	7.59	9.70	17.28	2	175.16
<i>Lagerstroemia microcarpa</i>	1.40	5.86	6.06	11.92	3	135.35
<i>Dalbergia latifolia</i>	0.74	5.52	3.19	8.71	4	127.39
Unidentified	0.29	0.69	1.25	1.94	5	15.92

Table 2.7: Basal Area, Abundance, Dominance, IVI & Density/ha of important species from Old Teak Plantations

Plant Species	BA	Abun.	Domi.	IVI	Rank	D/ha
<i>Tectona grandis</i>	52.02	83.64	93.72	177.36	1	1791.4
<i>Lagerstroemia microcarpa</i>	3.13	13.75	5.64	19.39	2	18.39
<i>Wrightia sp.</i>	0.08	0.74	0.15	0.89	3	0.99
<i>Dalbergia latifolia</i>	0.12	0.37	0.21	0.58	4	0.50
<i>Stereospermum sp.</i>	0.07	0.37	0.13	0.50	5	0.50

In general the Old Teak Plantations are almost of pure Teak in composition, where as the Young Teak Plantation has resemblance to the Dry Deciduous Forest tree composition. This can also be due to the reason that in Old Teak Plantation, the Teak has already established canopy cover, before the tending operations stopped, thus leaving no space for other species to come up as in the case of the Young Teak Plantation.

The *Eucalyptus* spp as expected dominated the Eucalyptus plantations in density of individuals and IVI value. The tamarind was second dominant in both Disturbed Dry Deciduous Forest types and Eucalyptus Plantation. It is notable that in both the cases it had higher value of IVI because of the higher values in the Basal Area, especially in the DDDF it had a very low density than all other dominant tree species (Table-2.8). *Prosopis* sp. exhibited maximum density and IVI value in Disturbed Dry Deciduous Forests and third

in the Eucalyptus Plantation.

The coffee plantation had a very high density of *Ficus glomerata*, which is preferred, as a shade tree followed by *Erythrena variegata*, *Grewelia robusta* and *Mesopsis emani* (Table-2.9). All these species were planted regularly in the coffee plantations as shade trees and also to yield fuel-wood as loppings every year. *Ficus* being a fruiting tree and *Erythrena* with their nectar filled flowers attract large congregations of Mynas, Drongos, Hornbills, Flower-peckers and other species there by making the coffee plantations rich in avifauna. The Sloth Bear, Sambar and Barking Deer etc. eat the *Ficus* fruits and therefore, an influx of these animals into the Coffee Plantations is notable during the fruiting season. Probably less frequent predation within the Coffee Estates also attracts large herds of Gaur and seasonal forages of Elephants are also not uncommon in the plantation area.

Table 2.8: Basal Area, Abundance, Dominance, IVI & Density/ha of important species from Coffee Plantations

Vegetation types	EG	MD	DD	MS	GL	TF	YT	OT	CO	EU
Evergreen (EG)		44.19	32.43	11.43			39.47	26.58	29.11	12.60
Moist Decid. (MD)	44.19		38.27				50.00	32.56	40.24	15.69
Dry Decid. (DD)	32.43	38.27				29.17	51.61	32.10		21.05
Montane shola (MS)	11.43								3.08	
Grassland (GL)									1.82	
Disturbed Dry Decid. (TF)			29.17				31.17	26.67		54.69
Young Teak (YT)	39.47	50.00	51.61			31.17				
Old Teak (OT)	26.58	32.56	32.10			26.67				
Coffee (CO)	29.11	40.24		3.08	1.82					
Eucalyptus (EU)	12.60	15.69				54.69				

Table 2.9: Basal Area, Abundance, Dominance, IVI & Density/ha of important species from Coffee Plantations

Plant Species	BA	Abun.	Domi.	IVI	Rank	D/ha
<i>Ficus glomerata</i>	0.28	25.40	31.34	56.74	1	254.78
<i>Erythrina variegata</i>	0.17	30.95	18.67	49.62	2	310.51
<i>Grewelia robusta</i>	0.20	19.84	22.56	42.40	3	199.04
<i>Mesopsis emani</i>	0.15	11.11	16.59	27.70	4	111.46
Unidentified	0.025	3.17	2.80	5.98	5	31.85

Appendix-2.1

The list of plants from ACA

S. No.	Latin Name	Family	Common Name
1	<i>Abutilon ramosum</i> (Cav.) Guill.&Perr.	Malvaceae	NCNM
2	<i>Acacia concinna</i> DC.	Mimosaceae	Shekkoy
3	<i>Acacia dealbata</i> Link.	Mimosaceae	Sambai chavakku
4	<i>Acacia decurrens</i> ??	Mimosaceae	Nligiri charakku
5	<i>Acacia ferruginnea</i> DC.	Mimosaceae	Paramambai
6	<i>Acacia fruticosa</i> ??	Mimosaceae	Chinni
7	<i>Acacia instia</i> Willd.	Mimosaceae	Indu
8	<i>Acacia latorum</i> Willd.	Mimosaceae	Odai
9	<i>Acacia lucophloea</i> Willd.	Mimosaceae	Velvelam
10	<i>Acacia melanoxylon</i> Br.	Mimosaceae	Kathi chavukku
11	<i>Acacia millissima</i> ??	Mimosaceae	Pattai chavakku
12	<i>Acacia pennata</i> Willd.	Mimosaceae	vellindu
13	<i>Acacia planifrons</i> W. & A	Mimosaceae	Sithai salai Kodaivelam
14	<i>Acacia torta</i> (Roxb.) Craib.	Mimosaceae	NIL
15	<i>Acalypha brachystachya</i> Hornem.	Euphorbiaceae	NIL
16	<i>Achyranthus aspera</i> L.	Amaranthaceae	NIL
17	<i>Achyranthus bidentata</i> BL	Amaranthaceae	NIL
18	<i>Acrocarpus fraxinifolius</i> Wight.	Papilionaceae	Nelrai
19	<i>Acrocephalus hispidus</i> (L)	Lamiaceae	NIL
20	Nicolson & Sivadasan		NIL
21	<i>Acronychia larufolia</i> Bl.	Rutaceae	Vidukkamalai
22	<i>Acronychia pedunculata</i> (L) Miq)	Rutaceae	NIL
23	<i>Actinodaphne bourncii</i> ??	Lauraceae	NIL
24	<i>Actinodaphne madraspatana</i> Bedd.	Lauraceae	Thati
25	<i>Adina cordifolia</i> Hk. f.	Rubiaceae	Manjakkadambai
26	<i>Aegle marmelose</i> Corr.	Rutaceae	Koovalam
27	<i>Agave</i> sp.	Agavaceae	Kathzhi
28	<i>Aglaia elaeagnoidea</i> (Juss.) Benth	Meliaceae	NIL
29	<i>Aglaia lawii</i> (Wt) Sald	Meliaceae	NIL
30	<i>Ailanthus exelsa</i> Roxb.	Simaroubaceae	NIL
31	<i>Alangium lamarckii</i> Thw	Alangiaceae	Peemaram
32	<i>Alangium salvifolium</i> (L.F) Wang.	Alangiaceae	NIL
33	Subsp. <i>hexapetalum</i> (Lam.) Wang		
34	<i>Albizia ororatissima</i> (L.f)Benth	Mimosaceae	NIL
35	<i>Albizia amara</i> Boiv.	Mimosaceae	Alinhi
36	<i>Albizia lathamii</i> ??	Mimosaceae	Usal
37	<i>Albizia lebbek</i> Benth	Mimosaceae	Selvagai
38	<i>Albizia oderatissima</i> Benth	Mimosaceae	Ooduusil
39	<i>Allophylus cobbe</i> Bl.	Sapindaceae	Vagai
40	<i>Allophylus serratus</i> Roxb.	Sapindaceae	Perakkudikkai
41	<i>Allophylus serrulatus</i> Radlk.	Sapindaceae	NIL

S. No.	Latin Name	Family	Common Name
42	<i>Alstonia scholaris</i> Br.	Apocyanaceae	Ezhilampalai
43	<i>Alternanthera sessilis</i> R.Br.	Amaranthaceae	NIL
44	<i>Alternanthera tenella</i> Colla	Amaranthaceae	NIL
45	<i>Amorphophallus paeonifolius</i>	Araaceae	NIL
46	(Dennst) Nicolson		
47	<i>Ampelocissus rugosa</i> Lam.	Rhamnaceae	NIL
48	<i>Ampelocissus tomentosa</i>	Vitaceae	NIL
49	(Heyne ex Roth) Planch		
50	<i>Anacardium occidentale</i> Linn.	Anacardiaceae	Cashew nut
51	<i>Andodendron paniculatum</i> DC	Apocyanaceae	NIL
52	<i>Andodendron rhinosporum</i> Thw	Apocyanaceae	NIL
53	<i>Andrographis macrobotrys</i> Nees	Acanthaceae	NIL
54			
55	<i>Anilema ovaliflorium</i> Hook.f.	Commenliaceae	NIL
56	<i>Anilema scabernium</i> Kunth	Commenliaceae	NIL
57	<i>Annona squamosa</i> ??	Anonaceae	Sithpala maram
58	<i>Anogeissus latifolia</i> (Roxb.ex.DC)	Combretaceae	Vekkali
59	<i>Antidesma diandrum</i> ??	Euphorbiaceae	Aaariputi
60	<i>Arbrus preclatorius</i> Linn.	Fabaceae	kundumani
61	<i>Arenaria nilgherrensis</i> ??	Caryophyllaceae	NIL
62	<i>Argyreia elliptica</i> (Roth) Choisy	Asclepiaceae	NIL
63	<i>Arisaema barnesii</i> Fischer	Araceae	NIL
64	<i>Arisaema muricatum</i> Sivadasan	Araceae	NIL
65	<i>Arisaema laschnaultii</i> Engle	Araceae	NIL
66	<i>Arisaema tortosum</i> Schott.	Araceae	NIL
67	<i>Aristolachia</i> sp.	Aristolochiaceae	Pila, Pela
68	<i>Artocarpus hetrophylla</i> ??	Moraceae	Satavari
69	<i>Artocarpus integrifolia</i> Linn.f.	Moraceae	Peipila, Aini
70	<i>Artocarpus integrifolius</i>	Moraceae	NIL
71	<i>Artocarpus lakoocha</i>	Moraceae	NIL
72	<i>Asclepias carasavica</i> . L	Apocyanaceae	NIL
73	<i>Asparagus racemosus</i> Willd	Liliaceae	Kurundu
74	<i>Atalantia monophylla</i> Corr.	Rutaceae	Vembu, Veppam
75	<i>Atylosia goensis</i> (Dalz.) Dalz.	Fabaceae	NIL
76	<i>Balasamodendron berryi</i> Arn.	Burseraceae	Mulkiluvai
77	<i>Bambusa arundiancea</i> Ait.	Poaceae	Perumungil
78	<i>Barlaria</i> sp.	Acanthaceae	Karunkurinji
79	<i>Bassia latifolia</i> Roxb.	Sapotaceae	Kattiluppai
80	<i>Bassia longifolia</i> Linn.	Sapotaceae	Illuppai
81	<i>Bauhinia racemosa</i> Lam.	Caesalpiniaceae	Athi
82	<i>Begonia malabarica</i> Lam	Begoniaceae	NIL
83	<i>Beilschmeidia wightii</i> (Nees)	Lauraceae	NIL
84	Benth & Hook.f.		
85	<i>Berberis tinctoria</i> Lesh.	Berberidaceae	NIL

S. No.	Latin Name	Family	Common Name
86	<i>Biophytum sensitivum</i> (L) oc var.	Oxalidaceae	NIL
87	<i>candolleianum</i> (Wt)Edgw. & Hook f.		
88	<i>Bischofia javanica</i> Bl.	Euphorbiaceae	Malai poovarasu
89	<i>Bischofia javanica</i> BL.	Euphorbiaceae	NIL
90	<i>Bombax ceiba</i> L.	Bombacaceae	NIL
91	<i>Bombax pentandra</i> Linn.	Bombacaceae	Elavam
92	<i>Borassus flabellifer</i> Linn.	Arecaceae	Panamaram
93	<i>Boswellia serrata</i> Roxb.	Burseraceae	Vellai kungilium
94	<i>Bridelia roxburghiana</i> ??	Euphorbiaceae	NIL
95	<i>Bridelia retusa</i> Baill.	Euphorbiaceae	Adamaruthu, Mulvengai
96	<i>Bryonia patens</i> ??	Euphorbiaceae	NIL
97	<i>Buchnanan latifolia</i> Roxb.	Anacardiaceae	Sarai kattu mangai
98	<i>Butea frontosa</i> Roxb	Fabaceae	Elai porasu
99	<i>Cadaba indica</i> Lam.	Capparidaceae	NIL
100	<i>Cadaba trifilla</i> Wight.	Capparidaceae	NIL
101	<i>Caesalpinia boundicella</i> Fleming.	Caesalpinaceae	Kalichikai
102	<i>Caesalpinia crista</i> L.	Caesalpinaceae	NIL
103	<i>Caesalpinia mimosoides</i> Heyne.	Caesalpinaceae	NIL
104	<i>Calamus</i> sp.	Arecaceae	NIL
105	<i>Calaotropis gigantia</i> Br.	Asclepiadaceae	ceae
106	<i>Callicarpa tomentosa</i> Willd	Verbenaceae	NIL
107	<i>Callicarpa lanata</i> Linn.	Verbenaceae	Caaf-comul
108	<i>Calophyllum tomentosa</i> Wight.		Sarakidamaram
109	<i>Calophyllum weightianum</i> Wall		Sarakidamaram
110	<i>Canarium strictum</i> Roxb.	Burseraceae	Karinkungilium
111	<i>Canthium belligherranea</i> ??	Rubiaceae	Madukkarai
112	<i>Canthium dacocum</i> (Gaertn)Teijsm & Bann.var. <i>Ubelatum</i> (Wt.) Sant. & Merch.	Alangiaceae	NIL
114	<i>Canthium didymum</i> Roxb.	Rubiaceae	Navugu, Sulundu
115	<i>Canthium parvifloru</i> Ollium.	Rubiaceae	Athandan, sengam
116	<i>Canthium tranvancoricum</i>	Rubiaceae	NIL
117	(Bedd.) Hook f.		
118	<i>Capparis horrida</i> Linn. f.	Capparidaceae	Kolama
119	<i>Careya arborea</i> Roxb.	Lecythidaceae	Kila
120	<i>Cardiospermum helicacabum</i> L.	Sapindaceae	NIL
121	<i>Carissa carandas</i> Linn.	Apocynaceae	Sirukila
122	<i>Carissa spinarum</i> A. Dc.	Apocynaceae	Kundalpanai
123	<i>Caryota urens</i> Linn.	Arecaceae	Nedumarai
124	<i>Casearia tomentosa</i> Roxb.	Flacourtiaceae	NIL
125	<i>Casearia zylanica</i> Thw.	Flacourtiaceae	NIL
126	<i>Casearia coriaca</i> Thw.	Flacourtiaceae	Avaram
127	<i>Cassia absus</i> L.	Caesalpinaceae	NIL
128	<i>Cassia auriculata</i> L.	Caesalpinaceae	Konnai, Sarakonnai

S. No.	Latin Name	Family	Common Name
129	<i>Cassia fistula</i> L.	Caesalpiniaceae	Sarakonnai, Karunkonnai
130	<i>Cassia hirsuta</i> L.	Caesalpiniaceae	NIL
131	<i>Cassia manatana</i> Heyne.	Caesalpiniaceae	Tharai
132	<i>Cassia marginata</i> Roxb.	Caesalpiniaceae	Malai avaram
133	<i>Cassia occidentalis</i> L.	Caesalpiniaceae	Ponnaram
134	<i>Cassia tomentosa</i> L.	Caesalpiniaceae	Chandanavembu
135	<i>Cassia tora</i> L.	Caesalpiniaceae	Thangarai
136	<i>Cassia siamea</i> Lam.	Caesalpiniaceae	Kattavarai
137	<i>Catunaregam spinosum</i> (Thunt.) Tirvengadam	Rubiaceae	NIL
139	<i>Cayratia tenuifolia</i> Gagnep.	Vitaceae	NIL
140	<i>Cedrella toona</i> Roxb.	Meliaceae	Manjakadi
141	<i>Celosia pulchella</i> Mq.	Amaranthaceae	Velathavarai
142	<i>Celastrus paniculatus</i> Willd.	Celastraceae	NIL
143	<i>Celtis wightii</i> ??	Ulmaceae	Agil
144	<i>Centalla asiatica</i> (L.) Urban	Apiaceae	NIL
145	<i>Centrosema pubescens</i> Benth.	Fabaceae	NIL
146	<i>Ceropegia hirsuta</i> Wt & Arn.	Asclepiaceae	NIL
147	<i>Chasalia curviflora</i> Wall. ex.kurz	Rubiaceae	NIL
148	<i>Chikkrassia tabularis</i> Juss.	Meliaceae	Pooarasu
149	<i>Chionanthu mala-elengi</i> (Dennst) Green	Oleaceae	NIL
151	<i>Chloroxylon sweitania</i> DC.		Vettadu
152	<i>Cinnadessa baccifera</i> Miq.		Appatai
153	<i>Cinnamomum wightii</i> Meissa.	Lauraceae	Lavangapattai
154	<i>Cinnamomum zylanicum</i> Brea.	Lauraceae	Savathuchedi
155	<i>Cipadessa baccifera</i> (Roth) Miq	Meliaceae	NIL
156	<i>Cissampelos pareira</i> Linn.	Menispermaceae	Ana
157	<i>Cissus discolor</i> Bl.	Vitaceae	NIL
158	<i>Cissus repens</i> Lam.	Vitaceae	NIL
159	<i>Clausena willdenovii</i> W. & A.	Rutaceae	Odugin, Oduvai
160	<i>Cleidion spiciflorum</i> (Burm f.) Merr.	Euphorbiaceae	NIL
161	<i>Cleistanthus collinus</i> ??	Euphorbiaceae	NIL
162	<i>Clematis wightiana</i> Wall.	Ranunculaceae	NIL
163	<i>Clerodendron serratum</i> Spreng.	Verbenaceae	Kudirai pudukuannu
164	<i>Clematis gouriana</i> Roxb.	Ranunculaceae	Chiruthelek
165	<i>Clusena heptaphylla</i> (Roxb.) Wt. & Arn.	Rutaceae	NIL
166	<i>Clusena indica</i> (Dalz) Oliver	Rutaceae	NIL
167	<i>Cochlospermum gossypium</i> DC		Kapi
168	<i>Coffea arabica</i> ??	Rubiaceae	Odaikodi
169	<i>Coleus malabaricus</i> Benth	Lamiaceae	NIL
170	<i>Combretum ovalifolium</i> Roxb.	Combretaceae	NIL
171	<i>Commelina indehiscens</i> Barnes	Commenliaceae	NIL

S. No.	Latin Name	Family	Common Name
172	<i>Commelina kurzii</i> Cl.	Commenliaceae	NIL
173	<i>Convolvulus flavus</i> Willd.	Convolvulaceae	Nariviti
174	<i>Corchorus aestuans</i> L.	Tiliaceae	NIL
175	<i>Cordia fulvosa</i> Wight.	Asclepiaceae	Kalvirisu
176	<i>Cordia maeleodii</i> Hk. f. & T	Asclepiaceae	Vaghukkai
177	<i>Cordia myxa</i> L.	Asclepiaceae	Palanteku
178	<i>Cordia obligua</i> Willd	Asclepiaceae	NIL
179	<i>Cordia wallachai</i> G Den	Asclepiaceae	Mavalingum
180	<i>Cototnaester buxifolia</i> Wall.	Rosaceae	NIL
181	<i>Crassocephalum crepidioides</i>	Asteraceae	NIL
182	(Benth) S Mooze		
183	<i>Crataeva religiosa</i> Forst	Capparidaceae	NIL
184	<i>Creptolepis buchanani</i>	Asclepiaceae	Sunju
185	<i>Crotalaria trifoliastrium</i> Willd.	Fabaceae	NIL
186	<i>Croton malabaricum</i> Bedd.	Euphorbiaceae	NIL
187			
188	<i>Curculigo orchioides</i> Gaertn.	Hypoxidaceae	NIL
189	<i>Curcuma pseudomontana</i> Grah.	Zingiberaceae	NIL
190	<i>Curcuma vamna</i> Sabu & Mangaly	Zingiberaceae	NIL
191	<i>Curcuma zeodoria</i> (Christm.) Roscoe	Zingiberaceae	NIL
192	<i>Cyanchum callialatum</i> Buch Ham Wt & Arn	Asclepiaceae	NIL
193	<i>Cyanoglossum denticulatum</i>	Asclepiaceae	NIL
194	A. DC. var <i>zylanicum</i> C. B CL		
195	<i>Cyanotis axillaris</i> (L) Schultes & Schultes f.	Commenliaceae	NIL
196	<i>Cyanotis papilionaceae</i> Schult f.	Commenliaceae	NIL
197	<i>Cyanotis pilosa</i> Schultes	Commenliaceae	NIL
198	<i>Cyathocalyx zylanicus</i> Champ ex	Annonaceae	NIL
199	Hook f & Thoms		
200	<i>Cyathula prostrata</i> (L) Bl.	Amaranthaceae	NIL
201	<i>Cycas circinalis</i> L.	Cycadaceae	Phothagqathi
202	<i>Cyclea arnottii</i> Miers	Menispermaceae	NIL
203	<i>Cyclea fissicalyx</i> Dunni	Menispermaceae	NIL
204	<i>Cynodon arcuatus</i> J.S.Presl.	Poaceae	NIL
205	<i>Cyrtococcum deccanense</i> Bor.	Poaceae	NIL
206	<i>Dalbergia coromondaliana</i> ???	Fabaceae	Umathai
207	<i>Dalbergia latifolia</i> Roxb.	Fabaceae	Sissoo
208	<i>Dalbergia paniculata</i> Wall.	Fabaceae	Viruvitta
209	<i>Dalbergia sisoides</i> Grah.	Fabaceae	NIL
210	<i>Dalbergia sissoo</i> Roxb.	Fabaceae	Soluvam
211	<i>Daphniphyllum glaucescense</i> ??	Euphorbiaceae	Sirumungil
212	<i>Darducalensis striculus</i> ??		NIL
213	<i>Datura stramonium</i> L.	Convolvulaceae	NIL
214	<i>Desmodium heterophyllum</i> (Willd.) DC.	Fabaceae	NIL
215	<i>Desmodium ormocarpoides</i> DC	Fabaceae	NIL

S. No.	Latin Name	Family	Common Name
216	<i>Desmoos lawii</i> (Hook,f & Thoms) Safford	Annonaceae	NIL
217	<i>Didymocarpus tomentosus</i> Wight.	Sorophulariaceae	NIL
218	<i>Dimorphocalyx lawianus</i> Hk. f.	Euphorbiaceae	NIL
219	<i>Diosachus leschnaulti</i> ??		NIL
220	<i>Diospyros bourdilloni</i> Bradis	Ebonaceae	NIL
221	<i>Diospyros buxifolia</i> (Blume) Hierr	Ebonaceae	NIL
222	<i>Diospyros cordifolia</i> Roxb.	Ebonaceae	NIL
223	<i>Diospyros melanoxylon</i> Roxb.	Ebonaceae	Karunthali, Karunthumbai
224	<i>Diospyros montana</i> Roxb.	Ebonaceae	Vakkanai
225	<i>Dioscorea oppositifolia</i> L.	Dioscoreaceae	NIL
226	<i>Dioscorea pentaphylla</i> L.	Dioscoreaceae	NIL
227	<i>Disperis neilgherrensis</i> Wight	Orchidaceae	NIL
228	<i>Dodonea viscosa</i>	Sapindaceae	Virali
229	<i>Dolichandrone falcata</i> Seem.	Bignoniaceae	Kadalati
230	<i>Dolichos trilobus</i> L.	Fabaceae	NIL
231	<i>Dysoxylum binectariferulm</i> Hook. f.	Meliaceae	NIL
232	<i>Dysoxylum malabaricum</i> Bedd.ex Hiern	Meliaceae	NIL
233	<i>Ealaegnus kologa</i> ??	Elaeagnaceae	Kulanji
234	<i>Echinochloa colona</i> (L.) Link	Poaceae	NIL
235	<i>Feronia elephantum</i> ??	Rutaceae	Vila
236	<i>Elaeodendron anfractuosum</i> ??		Kalyanamurukku
237	<i>Elaeodendron glaucum</i> Pers	Elaeocarpaceae	Karukkuvachi
238	<i>Eleocarpus ferrugineus</i> Steud	Elaeocarpaceae	NIL
239	<i>Eleocarpus munroii</i> Mast	Elaeocarpaceae	NIL
240	<i>Eleocarpus oblongus</i> Gaertn	Elaeocarpaceae	Attangottai
241	<i>Eleocarpus serratus</i> Heyne	Elaeocarpaceae	Karai
242	<i>Eleocarpus tuberculatus</i> Roxb.	Elaeocarpaceae	Pattachi
243	<i>Elettaria cardamomum</i> Maton	Zingiberaceae	Elavam
244	<i>Eleusine indica</i> (L.) Gaertn.	Poaceae	NIL
245	<i>Emblica officinale</i> Gaertn	Euphorbiaceae	Nelli
246	<i>Emilia scabra</i> DC	Asteraceae	NIL
247	<i>Entada pursaetha</i> DC	Mimosaceae	NIL
248	<i>Entada scandense</i> Benth.	Mimosaceae	Thellikkakodi
249	<i>Eranthemum capense</i> L.	Acanthaceae	NIL
250	<i>Ergrosteilla bifaria</i> (Vahl) Bor.	Poaceae	NIL
251	<i>Erythrina indica</i> Lam.	Fabaceae	Mullumurukku
252	<i>Erythrina stricta</i> L.	Fabaceae	NIL
253	<i>Erythroxylon monagynum</i> Roxb.	Erythroxylaceae	Sembulichen, Davadaru,Summna
254	<i>Embelia robusta</i> Roxb.		NIL
255	<i>Eucalyptus globulosus</i> Labill.	Myrtaceae	Karpuram
256	<i>Eugenia jumbolana</i> Lam.	Myrtaceae	Navai
257	<i>Euonymus crenulatus</i> Wall	Celastraceae	NIL

S. No.	Latin Name	Family	Common Name
258	<i>Euphorbia antiqorum</i> Linn.	Euphorbiaceae	Pothalathi
259	<i>Euphorbia tirucalli</i> Linn.	Euphorbiaceae	Tirukukali
260	<i>Eurya japonica</i> Thunb		NIL
261	<i>Evodia roxburghiana</i> Benth	Rutaceae	Kattushoubagum
262	<i>Excoecaria crenulata</i> Wt.	Euphorbiaceae	NIL
263	<i>Excoecaria robusta</i> Hook. f	Euphorbiaceae	NIL
264	<i>Fahrenheitia zeylanica</i> (Thw.) Airy Shaw	Euphorbiaceae	NIL
265	<i>Ficus auriculata</i> Lour.	Urticaceae	
266	<i>Ficus benjamina</i> L.	Urticaceae	
267	<i>Ficus bengalensis</i> Linn.	Urticaceae	Peral
268	<i>Ficus callosa</i> Willd.	Urticaceae	
269	<i>Ficus carica</i> L.	Urticaceae	
270	<i>Ficus drupacea</i> Thunb	Urticaceae	NIL
271	Var. <i>pubescens</i> (Roth) Corner	Urticaceae	
272	<i>Ficus glomerata</i> Roxb.	Urticaceae	Athi
273	<i>Ficus laevis</i> Blume var. <i>macrocarpa</i> (Miq) Corner	Urticaceae	
274	<i>Ficus macrophylla</i> Desf. ex Pers.	Urticaceae	
275	<i>Ficus palmata</i> Forskk.	Urticaceae	
276	<i>Ficus religiosa</i> Linn.	Urticaceae	Arayal
277	<i>Flacortia ramontchi</i> Wall	Flacourtiaceae	Shottukalakovikarai
278	<i>Flemingia grahamiana</i> W. & A	Fabaceae	NIL
279	<i>Flemingia nigherensis</i> ??	Fabaceae	NIL
280	<i>Fluggea microcarpa</i> ??	Euphorbiaceae	Vellapula
281	<i>Garcinia cambogia</i> Desr.	Garciniaceae	Korukkapuli
282	<i>Gardenia gummiferra</i> Linn.F	Rubiaceae	Kumbili
283	<i>Gardenia</i> sp.	Rubiaceae	Kalveerai
284	<i>Gardenia tungida</i> ??\	Rubiaceae	Malankarai
285	<i>Garuga pinnata</i> Roxb.	Burseraceae	Udiyan
286	<i>Gastrtochilus calceolaria</i> ??	Orchidaceae	NIL
287	<i>Gastrtochilus pulchellus</i> (Wt.) Schlecht	Orchidaceae	NIL
288	<i>Gaultheria fragrantissima</i> wall	Ericaceae	Kolakkai
289	<i>Geophila repens</i> (L.) Johnson	Rubiaceae	NIL
290	<i>Girardinia heterophylla</i> Dcne	Urticaceae	NIL
291	<i>Givotia rottleriformis</i> Griff	Euphorbiaceae	Velthadai
292	<i>Globba ophioglossa</i> Wt.	Zingiberaceae	NIL
293	<i>Glochidion pauciflorum</i> Gamble	Euphorbiaceae	NIL
294	<i>Glochidion velutinum</i> Wight.	Euphorbiaceae	Panickaru
295	<i>Gloriosa superba</i> L.	Liliaceae	NIL
296	<i>Glycosmis mauritiana</i> (Lam.) Tanaka	Rutaceae	NIL
297	<i>Glycosmis pentaphylla</i> (Retx.) DC	Rutaceae	NIL
298	<i>Glycosmis pentaphylla</i> (Retzz) DC var. <i>angustifolia</i>	Rutaceae	NIL
299	<i>Gmelina arborea</i> Roxb.	Verbenaceae	Kumil
300	<i>Gmelina asiatica</i> L.	Verbenaceae	Mulkumil

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301	<i>Gomphandra coriaca</i> Wight	Icacinaceae	NIL
302	<i>Gomphostemma heyneanum</i> Wall. ex. Benth	Lamiaceae	NIL
303	var. <i>rottleri</i> Prain		
304	<i>Gordonia obtusa</i> Roxb.	Theaceae	NIL
305	<i>Grewia barberi</i> Drumn.	Tiliaceae	NIL
306	<i>Grewia laevigata</i> Vahl	Tiliaceae	Marattai
307	<i>Grewia lanceaefolia</i> Roxb.	Tiliaceae	NIL
308	<i>Grewia tiliaefolia</i> Vahl.	Tiliaceae	Uduppai
309	<i>Gymnopia ovata</i> Laws		NIL
310	<i>Gyrocarpus jacquini</i> Roxb.		Thanakku
311	<i>Habenaria multicaudata</i> Seadgew.	Orchidaceae	NIL
312	<i>Hadina cordifolia</i> (Roxb. Ridsdale	Rubiaceae	NIL
313	<i>Hardwickia binata</i>	Caesalpiniaceae	Acha, usa
314	<i>Harpullia arborea</i> (Blanco) Radlk.	Sapindaceae	NIL
315	<i>Helecteres isora</i> L.	Tiliaceae	Valmburi
316	<i>Hemicyclia sepiaria</i> W. & A.	Euphorbiaceae	Virai
317	<i>Hemicyclia wightii</i> (Hook. I.) Pax & Hoffm	Euphorbiaceae	NIL
318	<i>Hemidesmus indicus</i> (L) R. Br.	Asclepediaceae	Nannari
319	<i>Heracleum sp.</i>	Apiaceae	Madavi
320	<i>Hibiscus furcatus</i> Roxb.	Malvaceae	NIL
321	<i>Hibiscus surattensis</i> L.	Malvaceae	NIL
322	<i>Hiptage madablota</i> Gaertn		Palai, Veppalai
323	<i>Holarrhena antidysenterica</i> Wall	Apocynaceae	Avai, Aya
324	<i>Holigarna arnotiana</i> Hk. f.	Anacardiaceae	Kongu
325	<i>Holoptilia integrifolia</i> Planch.	Ulmaceae	Motirakodi
326	<i>Hopea parviflora</i> Ibedd.	Dipterocarpaceae	Pohillamaram
327	<i>Hopea parviflora</i> Bedd.	Dipterocarpaceae	NIL
328	<i>Hugonia mystax</i> L.		Pohillamaram
329	<i>Hydnocarpus excelsum</i> ??	Flacourtiaceae	NIL
330	<i>Hydnocarpus laurifolia</i> (Dennst) Selumer	Flacourtiaceae	NIL
331	<i>Hymenodictyon orixense</i> (Roxb.) Mabberley	Rubiaceae	NIL
332	<i>Hymenodictyon excelsum</i> Wall.	Rubiaceae	NIL
333	<i>Hypericum wightianum</i> Wall.	Hypericaceae	NIL
334	<i>Ilex wightiana</i> Wall.	Aquifoliaceae	Vellodai
335	<i>Ichnocarpus frutescens</i> Br.	Apocynaceae	Uthalaikodi
336	<i>Impatiens balsamina</i> L.	Balsaminaceae	NIL
337	<i>Impatiens floribunda</i> Wt	Balsaminaceae	NIL
338	<i>Impatiens ligulata</i> Bedd.	Balsaminaceae	NIL
339	<i>Indigofera constricta</i> (Trimen) Thw.	Fabaceae	NIL
340	<i>Indigofera spicata</i> Forskk.	Fabaceae	NIL
341	<i>Indigofera wightii</i>	Fabaceae	NIL
342	<i>Ipomea deccana</i> Austin	Asclepediaceae	NIL
343	<i>Ipomea obscura</i> (L) Ker. Gawl	Asclepediaceae	Oonakodi
344	<i>Isonandra candolliaena</i> Wight.	Sapotaceae	NIL

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345	<i>Ixora cuneifolia</i> Roxb.	Rubiaceae	NIL
346	<i>Ixora nigricans</i> R. Br.	Rubiaceae	NIL
347	<i>Ixora parviflora</i> Vahl.	Rubiaceae	Kora
348	<i>Ixora pavetta</i> Andr.	Rubiaceae	NIL
349	<i>Jasminum azoricum</i> L	Oleaceae	NIL
350	<i>Jasminum rottelianum</i> Wall ex. DC	Oleaceae	NIL
351	<i>Jatropha curcas</i> L.	Euphorbiaceae	Kattamanku
352	<i>Jistocoea gendursoa</i>	Acanthaceae	NIL
353	<i>Jistocoea santapau</i> Bennet	Acanthaceae	NIL
354	<i>Jistocoea waynaadensis</i> (Nees) And	Acanthaceae	NIL
355	<i>Kalanchoe lanceolata</i> (Forsk.) Pers.	Crassulaceae	NIL
356	<i>Knema attenuata</i> (Wall.ex.	Myristicaceae	NIL
357	<i>Hook f. & Thoms.) Warb</i>		
358	<i>Kydia calcina</i> Roxb.	Malvaceae	NIL
359	<i>Lagaca mollis</i> cav.	Asteraceae	NIL
360	<i>Lagestromia lanceolata</i> Bedd	Lythraceae	Vevala, Ventek
361	<i>Lagestromia microcarpa</i> Wt.	Lythraceae	NIL
362	<i>Lagestromia reginae</i> Roxb.	Lythraceae	NIL
363	<i>Lansium anamallayanum</i> Bedd.		NIL
364	<i>Lantana aculiata</i> L.	Compositae	Arippu
365	<i>Laportea crenulata</i> Gaud.	Urticaceae	NIL
366	<i>Laportea terminalis</i> Wight.	Urticaceae	NIL
367	<i>Lasiosiphon eriocephalus</i> Dene.		Vandakallipatti
368	<i>Lantana camera</i> L.	Compositae	Puchedi
369	<i>Lattisomia</i> sp.		NIL
370	<i>Lawsonia alba</i> Lam.	Lythraceae	Marudhani
371	<i>Leea aspera</i> Wall.	Leeaceae	NIL
372	<i>Leea indica</i> (Burm.f.) Merr	Leeaceae	NIL
373	<i>Leucas chinensis</i> (Retx.) R.Br.	Lamiaceae	NIL
374	<i>Liaconia aedissima</i> ??		Naivela
375	<i>Liasonia alata</i> ??		NIL
376	<i>Ligustrum roxburghii</i> Clarke.	Oleaceae	NIL
377	<i>Lindernia angalis</i> (Burn f) Pennell	Sorophulariaceae	NIL
378	<i>Lindernia numularifolia</i> (D. Don) Wettst.	Sorophulariaceae	NIL
379	<i>Lindernia parviflora</i> (Roxb) Hains.	Sorophulariaceae	NIL
380	<i>Litsea coriacea</i> Hook.f.	Lauraceae	NIL
381	<i>Litsea deccanensis</i> ??	Lauraceae	Perumbanadati
382	<i>Litsea stocksii</i>	Lauraceae	??
383	<i>Litsea wightiana</i> Benth. & Hk.f	Lauraceae	NIL
384	<i>Lonicera leschnaultii</i> Wall.	Caprifoliaceae	NIL
385	<i>Loranthus</i> sp.	Loranthaceae	Pullurivi
386	<i>Ludwigia hyssopifolia</i> (G. Don) Excell	Onagraceae	NIL
387	<i>Ludwigia octovalvis</i> (Jacq.) Raven	Raven	NIL
388	<i>Sub sp. sessiliflora</i> (Mich.)		

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389	<i>Ludwigia perennis</i> L.	Passifloraceae	NIL
390	??* <i>Adenia hondala</i> (Gaertn.) de Wilde		
391	<i>Luisia zeylanica</i> Lindl.	Orchidaceae	NIL
392	<i>Macaranga indica</i> Wight.	Euphorbiaceae	Battakanni, Thenna
393	<i>Maesa indica</i> (Roxb). DC	Myrsinaceae	NIL
394	<i>Maesa perrottetiana</i> A. DC.	Myrsinaceae	NIL
395	<i>Mahilus acarantha</i> ??	Lauraceae	Kolarmavu
396	<i>Mahonia nepalensis</i> DC	Coriariaceae	NIL
397	<i>Mallaotus albus</i> Muell.	Euphorbiaceae	Mallupolavu
398	<i>Mallotus Philippensis</i> (Lam.)M.Arg.	Euphorbiaceae	Kanapottu
399	<i>Mangifera indica</i> L.	Anacardiaceae	Mamaram
400	<i>Mappia foetida</i> Miers.		Arali
401	<i>Muba buxifolia</i> ??	Ebenaceae	Kattituvurai
402	<i>Melia dubia</i> Cav.	Meliaceae	Malavembu
403	<i>Meliosma wightii</i> Planch.		Tode
404	<i>Memecylon edule</i> Roxb.	Melastomataceae	Kayan
405	<i>Memecylon grande</i> Retz.	Melastomataceae	NIL
406	<i>Mesua ferrea</i> L.	Clusiaceae	Nangal
407	<i>Michelia nilgirica</i> Zenk.	Magnoliaceae	NIL
408	<i>Michelia chambaca</i> L.	Magnoliaceae	Shampakam
409	<i>Micrococca beddomei</i> (Hook.f.) Prain	Euphorbiaceae	NIL
410	<i>Milusa velutina</i> Hk. f. & T		Pohanji
411	<i>Mimosa pudica</i> L.	Mimosaceae	NIL
412	<i>Mimusops elongi</i> L	Sapotaceae	Magilan
413	<i>Mimusops hexandra</i> Roxb.	Sapotaceae	Kanupala
414	<i>Mitracarpus villosus</i> (Sw.)DC	Rubiaceae	NIL
415	<i>Mitragyna parvifolia</i> (Roxb.) Korth	Rubiaceae	NIL
416	<i>Mollugo pentaphylla</i> L.	Molluginaceae	NIL
417	<i>Momordia dioica</i> Roxb.	Cucurbitaceae	NIL
418	<i>Monochoria vaginalis</i> (burm.f.) Presl.	Pontederiaceae	NIL
419	<i>Morinda citrifolia</i> L.	Rubiaceae	Manjati
420	<i>Morinda tinctoria</i> Roxb.	Rubiaceae	Nona
421	<i>Moringa pterygosperma</i> Grtn	Moringaceae	Kattumurungai
422	<i>Mucuna hirsuta</i> W. & A.	Fabaceae	NIL
423	<i>Mundulea suberosa</i> Benth.	Fabaceae	Vellaporasu
424	<i>Murdannia japonica</i>	Commenliaceae	NIL
425	<i>Murdannia terminalis</i> Wt.	Commenliaceae	NIL
426	<i>Murraya paniculata</i> (L)jack	Rutaceae	NIL
427	<i>Murrayya exotica</i> ??	Rutaceae	Karuveppalai
428	<i>Musa sp.</i>	Musaceae	Vazhai
429	<i>Mussaenda frondosa</i> L.	Rubiaceae	NIL
430	<i>Mussanda hirsutissima</i> ??	Rubiaceae	NIL
431	<i>Myristica attenuata</i> Wall.	Myristicaceae	Amaie
432	<i>Myristica laurifolius</i> Hk.f&T	Myristicaceae	Jathikai

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433	<i>Myrophyllum diganthum</i> (Wt. & Arn.) F.v. Muell	Haloragaceae	NIL
434	<i>Naringi cremulata</i> (Roxb.) Nicolson	Rutaceae	NIL
435	<i>Nauclea purpurea</i> Roxb.		Nirkadambai
436	<i>Neolitsea foliosea</i> Nees var. caessia Meissner	Lauraceae	NIL
437	<i>Neolitsea scrobiculate</i> Gamble	Lauraceae	NIL
438	<i>Neonotinia wightii</i> (Grah. ex. Wt. & Arn.) Lackey	Fabaceae	NIL
439	<i>Nephelium longana</i> Camp.	Anacardiaceae	Koorappu
440	<i>Nesaea lanceolata</i> (Heyne ex Cl.) Koehne	Lythraceae	NIL
441	<i>Nothpeqia racemosa</i> (Dalz.) Ramam	Anacardiaceae	NIL
442	<i>Oberonia anamalayana</i> Joseph	Orchidaceae	NIL
443	<i>Oberonia zelyanica</i> Hook. f.	Orchidaceae	NIL
444	<i>Ochalandra</i> sp.	Poaceae	Ithai
445	<i>Ocimum sanctum</i> L.	Lamiaceae	Thualsi
446	<i>Ocimum gratissimum</i> L.	Lamiaceae	NIL
447	<i>Odina wodier</i> Roxb.	Anacardiaceae	Udimaram
448	<i>Olax wightiana</i> Wall. ex Wt & Arn.	Olacaceae	NIL
449	<i>Oldenlandia articularis</i> ??	Rubiaceae	NIL
450	<i>Oldenlandia spylora</i> ??	Rubiaceae	NIL
451	<i>Olea glandulifera</i> Wall	Oleaceae	NIL
452	<i>Ophiopogon intermedius</i>	Liliaceae	NIL
453	<i>Ophiorrhiza barbery</i> Gamble	Rubiaceae	NIL
454	<i>Ophiorrhiza harisisana</i> Heyne	Rubiaceae	NIL
455	<i>Ophiorrhiza hirsutula</i> Wt. ex Hook. f.	Rubiaceae	NIL
456	<i>Oplismenus compositus</i> Beauv.	Poaceae	NIL
457	<i>Opuntia</i> sp.	Cactaceae	Mullucali/Vattakalli
458	<i>Orpohea eythrocarpa</i> Bedd.	Annonaceae	NIL
459	<i>Orpohea thomsonii</i> Bedd	Annonaceae	NIL
460	<i>Orpohea uniflora</i> Hook, f & Thoms	Annonaceae	NIL
461	<i>Orpohea zylanica</i> Hook, F & Thoms	Annonaceae	NIL
462	<i>Orthosphon glabratus</i> Benth	Lamiaceae	NIL
463	<i>Orysa meyeriana</i> (Zoll. & Mor.) Baill Var. <i>graulata</i>	Poaceae	NIL
464	(Nees & Arn. ex Watt) Duist		
465	<i>Osbekia leschnaultiana</i> DC.	Melastomaceae	NIL
466	<i>Osbekia linkolata</i> ??	Melastomaceae	NIL
467	<i>Osbekia reticulata</i> Bedd.	Melastomaceae	NIL
468	<i>Osbekia wightiana</i> Benth.	Melastomaceae	NIL
469	<i>Oxalis corniculata</i> L.	Oxalidaceae	NIL
470	<i>Pancratium triflorum</i>	Amaryllidaceae	NIL
471	<i>Paspalum conjugatum</i> Berg.	Poaceae	NIL
472	<i>Passiflora</i> sp.	Passifloraceae	NIL
473	<i>Pavetta burnonis</i> Wal. ex G Don	Rubiaceae	NIL
474	<i>Pavetta indica</i> L.	Rubiaceae	Pavattai

S. No.	Latin Name	Family	Common Name
475	<i>Pavetta. wighttii</i> Hook.f.	Rubiaceae	NIL
476	<i>Pandanus</i> sp.	Pandanaceae	Thalai
477	<i>Peristrophe paniculata</i> (Forsk.) Brummit	Acanthaceae	NIL
478	<i>Phaulopsis imbricata</i> (Forsk.) Sweet	Acanthaceae	NIL
479	<i>Phoebe wightii</i> Meissn	Lauraceae	NIL
480	<i>Phoenix acaulis</i> Ham.	Arecaceae	Echan, Eenji
481	<i>Phoenix sylvestris</i> Thw.	Arecaceae	Echan
482	<i>Photinia notoniana</i> Wall	Rosaceae	NIL
483	<i>Phyllanthus gardenerianus</i> Baill.	Euphorbiaceae	NIL
484	<i>Phyllanthus macraei</i> Muell.	Euphorbiaceae	NIL
485	<i>Phyllanthus missionais</i> hook.f.	Euphorbiaceae	NIL
486	<i>Phyllanthus rheedii</i> Wt.	Euphorbiaceae	NIL
487	<i>Phyllanthus urinaria</i> L.	Euphorbiaceae	NIL
488	<i>Pinus attenuata</i> ??	Pinaceae	NIL
489	<i>Pinus insignis</i> ??	Pinaceae	NIL
490	<i>Pinus maritima</i> ??	Pinaceae	NIL
491	<i>Pinus sabiniana</i> ??	Pinaceae	NIL
492	<i>Piper brachystachyum</i> Wall.	Piperaceae	NIL
493	<i>Piper galeatum</i> DC	Piperaceae	NIL
494	<i>Piper hymenophyllum</i> Miq.	Piperaceae	NIL
495	<i>Piper schimdtii</i> Hk.&f.	Piperaceae	Kodikapuli
496	<i>Piper Trichostachyon</i> (Miq.) DC	Piperaceae	NIL
497	<i>Piper trioicum</i> Roxb.	Piperaceae	NIL
498	<i>Pithecolobium dulce</i> Benth.	Mimosaceae	NIL
499	<i>Pittosporum nilghirens</i>	Pittosporaceae	NIL
500	<i>Plumbago zylanica</i>	Plumbaginaceae	NIL
501	<i>Plumeria acutifolia</i> Poir.	Apocynaceae	Kilimandharai
502	<i>Pogostemon benghalensis</i> (Brum.f.) O.Kuntze	Lamiaceae	NIL
503	<i>Polyalthia cerasoides</i> Benth, & Hk. f	Anonaceae	Nedunari
504	<i>Polygala arillata</i> ???	Polygalaceae	NIL
505	<i>Polygonum glabrum</i> Willd	Polygonaceae	NIL
506	<i>Polygonum minus</i> Huds	Polygonaceae	NIL
507	<i>Polygonum paniculatum</i> Bl.	Polygonaceae	NIL
508	<i>Pongamia glabra</i> Vent	Leguminaceae	NIL
509	<i>Porana integrifolia</i> ??	Convolvulaceae	Minnai
510	<i>Porana malabarica</i> Clarke	Convolvulaceae	NIL
511	<i>Potulaca oleracea</i> L.	Portulacaceae	NIL
512	<i>Potulaca pilosa</i> L.	Portulacaceae	NIL
513	<i>Pouzolzia wightii</i> Benn var.scabra	Urticaceae	NIL
514	<i>Pouzolzia zeylanica</i> (L.) Benn.	Urticaceae	NIL
515	<i>Premna cordifolia</i> Roxb.	Verbenaceae	NIL
516	<i>Premna tomentosa</i> willd	Verbenaceae	Kolakkattai thekku
517	<i>Prosopis specigera</i> L.	Mimosaceae	Vanni, Parambai
518	<i>Protium cordatum</i> W. &A.	Proteaceae	Senkiluvai

S. No.	Latin Name	Family	Common Name
519	<i>Psychotria congesta</i> W. &A.	Rubiaceae	NIL
520	<i>Pterocarpus marsupium</i> Roxb.	Fabaceae	Vengai
521	<i>Pterolobium indicum</i> A. Rich.	Mimosaceae	Karindu, Indu
522	<i>Pycreus odoratus</i> Urban	Cyperaceae	NIL
523	<i>Pygeum gardeneri</i> Hk.f	Rosaceae	Kodalai
524	<i>Pygium wightianum</i> Bl.	Rosaceae	Irumbikanni
525	<i>Radermachera xylocarpa</i> (Roxb.) K.Schum	Sorophulariaceae	NIL
526	<i>Randia dumetorium</i> Lam.	Rubiaceae	Karai
527	<i>Randia malabarica</i> Lam	Rubiaceae	Pidathi
528	<i>Randia uliginosa</i> DC.	Rubiaceae	Kalikarai
529	<i>Ranunculus reniformis</i> Wall.	Rununculaceae	NIL
530	<i>Ranunculus subpinnatus</i> W.&A.	Rununculaceae	NIL
531	<i>Ranunculus wallichianus</i> W.&A.	Rununculaceae	NIL
532	<i>Rauvolfia serpentina</i> 9L) Benth. ex	Apocyanaceae	NIL
533	<i>Rauvolfia tetraphylla</i> L	Apocyanaceae	NIL
534	<i>Rhamus virgatus</i> Roxb.	Rhamnaceae	NIL
535	<i>Rhamus wightii</i> W.&A.	Rhamnaceae	NIL
536	<i>Rhodomyrtus tomentosa</i> Wight	Myrtaceae	Thavittupoovarasu
537	<i>Rhododendron nilagiricum</i> Zenk.	Ericaceae	Poovarasu
538	<i>Rhychosia densiflora</i> (Roth.) DC	Fabaceae	NIL
539	<i>Rhynochoglossum notonianum</i> (Wall.)	Sorophulariaceae	NIL
540	<i>Rhus mysorensis</i> ??	Anacardiaceae	Chennavarai
541	<i>Rosa leschnaultiana</i> W.&A	Rosaceae	NIL
542	<i>Rubia cordifolia</i> L	Rubiaceae	NIL
543	<i>Rubis</i> sp.	Rosaceae	NIL
544	<i>Rubus ellipticus</i> Wall.	Rosaceae	Seendu
545	<i>Rubus moluccanus</i> L.	Rosaceae	NIL
546	<i>Rubus niveus</i> Wall.	Rosaceae	Kolandu
547	<i>Rubus racemosus</i> Roxb.	Rosaceae	NIL
548	<i>Rumex nepalensis</i> Spreng	Polygonaceae	NIL
549	<i>Runiga pectinata</i> (L) Nees	Acanthaceae	NIL
550	<i>S.pinnata</i> (L.f) Kurz)??	Anacardiaceae	NIL
551	<i>Saccopetalum tomentosum</i> Hk. f. & T	Anonaceae	NIL
552	<i>Sagaria dalzelli</i> Bedd	Annonaceae	NIL
553	<i>Salvadora persica</i> T. And.	S	Kunni
554	<i>Santalum album</i> L.	Santalaceae	Sanadana maram
555	<i>Sapindus emarginata</i> Vahl.	Sapindaceae	Naikotton
556	<i>Sarcococca trinervia</i> Wight.	Euphorbiaceae	NIL
557	<i>Schefflera stellata</i> ??	Araliaceae	NIL
558	<i>Schefflera trijuiga</i> ??	Araliaceae	Pulichi
559	<i>Schefflera wallichiana</i> ??	Araliaceae	NIL
560	<i>Schfflera racemosa</i> ??	Araliaceae	kannemaram
561	<i>Schfflera venulosa</i> (Wt.& Arn) Harms	Araliaceae	NIL
562	<i>Schleichera oleosa</i> (Lour.) O.Kuntze	Sapindaceae	NIL

S. No.	Latin Name	Family	Common Name
563	<i>Schrebera swetanoides</i> Roxb.	Oleaceae	Mohaalingum
564	<i>Scleria lithosperma</i> (L)Sw	Cyperaceae	NIL
565	<i>Scolopia crenata</i> Clos.	Flacourtiaceae	NIL
566	<i>Scolopia crenata</i> (Wight & Arn)Clos	Flacourtiaceae	NIL
567	<i>Scoparia dulcis</i> L.	Sorophulariaceae	NIL
568	<i>Scutia indica</i> Brongn.		Thrattai
569	<i>Scutia myertina</i> ??	Family	Kokkimuthu
570	<i>Securinega leucopyrus</i> (Willd) M.Arg.	Euphorbiaceae	NIL
571	<i>Selaginella</i> sp.		
572	<i>Semecarpus anacardium</i> Linn. f.	Anacardiaceae	Shenkottai
573	<i>Shorea talura</i> Roxb.	Dipterocarpaceae	Kungilium
574	<i>Sida beddomei</i> K.C.Jacob	Malvaceae	NIL
575	<i>Sida qlutinosa</i> Commers.ex. Cav.	Malvaceae	NIL
576	<i>Sideroxylon tomentosum</i> Roxb.		NIL
577	<i>Smilax</i> sp.	Liliaceae	NIL
578	<i>Solanum anguvia</i> Lam	Asclepediaceae	NIL
579	<i>Solanum giganteum</i> Jacq	Asclepediaceae	NIL
580	<i>Solanum melongena</i> L Var insanuam (L)Prain	Asclepediaceae	NIL
581	<i>Solanum torvum</i> Swartz	Asclepediaceae	NIL
582	<i>Soymidia febrifuga</i> ??		NIL
583	<i>Spatholobus roxburghii</i> Benth.	Fabaceae	NIL
584	<i>Spondias mangifera</i> Willd.	Anacardiaceae	NIL
585	<i>Sporobolus spicatus</i> Kunth.	Poaceae	NIL
586	<i>Stachyphrynium spicatum</i> (Roxb.) Schum	Zingiberaceae	NIL
587	<i>Stellaria</i> sp.	Caryophyllaceae	Kurinji
588	<i>Stemodia viscosa</i> (Roxb)	Sorophulariaceae	NIL
589	<i>Stephergyne parvifolia</i> Korth.		Nikadambai
590	<i>Sterculia foetida</i> Linn.	Sterculiaceae	Peenarimaram
591	<i>Stereospermum colais</i>	Sorophulariaceae	NIL
592	(Buch-Ham.ex.Dillw.) Mabblerley		
593	<i>Sterulia guttata</i> Roxb.	Stelculiaceae	NIL
594	<i>Strobilanthes consaguinea</i> (Nees) T. Anerson	Acanthaceae	
595	<i>Strobilanthes cuspidata</i> (Benth) T. Anderson	Acanthaceae	
596	<i>Strobilanthes foliosa</i> T. Anderson.	Acanthaceae	
597	<i>Strobilanthes Kunthiana</i> (Nees)	Acanthaceae	
598	<i>T. Anderson ex Benth</i>		
599	<i>Strobilanthes lurida</i> Wight.	Acanthaceae	
600	<i>Strobilanthes micrantha</i> wight.	Acanthaceae	
601	<i>Strobilanthes pulneynsis</i> C. B. Clarke.	Acanthaceae	
602	<i>Strobilanthes zenkeriana</i> (Nees) T. Anderson.	Acanthaceae	
603	<i>Strychnos nuxvomica</i> Linn.	Rubiaceae	Kanjiram
604	<i>Strychnos potatorum</i> Linn. f.	Rubiaceae	Thethan
605	<i>Striga euphrasioides</i> Benth	Sorophulariaceae	NIL
606	<i>Swetinia macrophylla</i> ??		NIL

S. No.	Latin Name	Family	Common Name
607	<i>Symblocos obtusa</i> Wall.	Symplocaceae	NIL
608	<i>Symplocos spicata</i> Roxb.	Symplocaceae	Kamblivetti
609	<i>Syzygium arnotianum</i> Walp.	Myrtaceae	Njaval
610	<i>Syzygium fergusonii</i> (Trimen) Gamble	Myrtaceae	NIL
611	<i>Syzygium gardeneri</i> THw.	Myrtaceae	NIL
612	<i>Syzygium hemisphericum</i> (Wt.) Alston	Myrtaceae	NIL
613	<i>Syzygium lanceolatum</i> (Lam.) Wt. & Arn.	Myrtaceae	NIL
614	<i>Tabermontana heyneana</i> Wall.	Apocynaceae	Nandivattai
615	<i>Tamerindus indica</i> Linn.	Caesalpiniaceae	Puli
616	<i>Tectona grandis</i> L.f.	Verbenaceae	Thekku
617	<i>Tephrosia tinctoria</i> Pers.	Fabaceae	NIL
618	<i>Terminalia crenulata</i> Wall.ex Guill & Perr	Combretaceae.	NIL
619	<i>Terminalia paniculata</i> Roth.	Combretaceae.	Adamarudu, Pillamaru
620	<i>Terminallia bellerica</i> Roxb.	Combretaceae.	Tanni
621	<i>Terminallia catappa</i> Linn.	Combretaceae.	Vattakottai
622	<i>Terminallia chebula</i> Retz.	Combretaceae.	Kadukkai
623	<i>Terminallia tomentosa</i> Bedd.	Combretaceae.	Karumarudu
624	<i>Tetrameles nudiflora</i> R. Br.	Tetramelaceae	Chini
625	<i>Tetrastigma lanceolarium</i>	Vitaceae	NIL
626	<i>Tetrastigma sulcatum</i> (Lam.) Gamble	Vitaceae	NIL
627	<i>Themeda triandra</i> (Nees ex Steud) Hack	Poaceae	NIL
628	<i>Theriophonum indicum</i> Engler	Araaceae	NIL
629	<i>Thespisia lampas</i> Dalz. & Gibs.	Malvaceae	NIL
630	<i>Thevetia nerifolia</i> ??	Apocynaceae	Kattupruthi
631	<i>Thunbergia tomentosa</i> Wall ex.Nees	Acanthaceae	NIL
632	<i>Tiliacora racemosa</i> Colebr.	Menispermaceae	Tirucachipa
633	<i>Toddalia aculiata</i>	Rutaceae	NIL
634	<i>Toddalia asiatica</i> Lam.	Rutaceae	Milakkaranai
635	<i>Topocarpus palghatensis</i> Gamble	Asclepiaceae	NIL
636	<i>Torenia hirsuta</i> Benth	Sorophulariaceae	NIL
637	<i>Torrenia bicolor</i> Dalz	Sorophulariaceae	NIL
638	<i>Trema orientalis</i> Bl.		Kattu milagu
639	<i>Tricholepis radicans</i> D.C	Asteraceae	NIL
640	<i>Tridax procumbens</i> L	Asteraceae	NIL
641	<i>Turpinia nepalensis</i> Wall.	Staphyleaceae	Heena Ambaruthi
642	<i>Urena lobata</i> Linn.	Malvaceae	Nila
643	<i>Urochloa panicoides</i> Beauv.	Poaceae	NIL
644	<i>Vaccinium leschnaultii</i> Wight.	Ericaceae	Ottatti
645	<i>Vaccinium nilgherrense</i> Wight.	Ericaceae	Aduvam
646	<i>Vateria indica</i> Thw.	Dipterocarpaceae	Kila
647	<i>Ventilago maderaspetana</i> Gaertn.	Rhamnaceae	Kungilium
648	<i>Vernonia arborea</i> Ham.	Asteraceae	Vembadam
649	<i>Vernonia fysoni</i> ??	Asteraceae	Sheithi

S. No.	Latin Name	Family	Common Name
650	<i>Vernonia pulneyensis</i> ??*	Asteraceae	NIL
651	<i>Vigna radiata</i> (L.) Wilczekvar.,	Fabaceae	NIL
652	<i>Sublobata</i> (Roxb.) Verdc		
653	<i>Viola canescens</i> Wall.	Violaceae	NIL
654	<i>Viola patrinji</i> DC.	Violaceae	NIL
655	<i>Viola serpens</i> Wall.	Violaceae	NIL
656	<i>Virbunum acuminatum</i> ??	Caprifoliaceae	Konakarum
657	<i>Virbunum coriaceum</i> ??	Caprifoliaceae	NIL
658	<i>Vitex altissima</i> Linn.f.	Verbenaceae	Miladi
659	<i>Vitex altissima</i> L.f.	Verbenaceae	NIL
660	<i>Vitex negundo</i> Linn.	Verbenaceae	Nochi
661	<i>Vitis</i> sp.	Vitaceae	NIL
662	<i>Walsura piscidia</i> Roxb.	Anacardiaceae	Valsura
663	<i>Webera corymbosa</i> Willd.		Theanni
664	<i>Wendlandia notoniana</i> Wall.	Rubiaceae	Kadambam
665	<i>Wrightia arborea</i> (dennst)Mabberley	Apocyanaceae	NIL
666	<i>Wrightia tinctoria</i> (Roxb) R, Br.	Apocyanaceae	Palai
667	<i>Zanthoxylum rhelsa</i> ??	Rutaceae	Mulliam
668	<i>Zehneria maysorensis</i> (Wt.& Arn.) Azn.	Cucurbitaceae	NIL
669	<i>Zingiber officinalis</i> Rosc.	Zingiberaceae	Ingi
670	<i>Zingiber purpureum</i> Roscoe	Zingiberaceae	NIL
671	<i>Ziziphus oenoplea</i> (L) Mill.	Rhamnaceae	NIL
672	<i>Zizyphus jujuba</i> Lam.	Rhamnaceae	Slandai
673	<i>Zizyphus rugosa</i> Lam.	Rhamnaceae	Kattilandai
674	<i>Zizyphus trinervia</i> Roxb.	Rhamnaceae	Kairkattum
675	<i>Zizyphus xylopyrus</i> Willd.	Rhamnaceae	Mulkottan
Ferns			
Sno.	Latin name	Family	NCNM
1	<i>Adiantum incism</i> Forskk.	Adinantaceae	NCNM
2	<i>Asplenium phyllitidis</i> G. Don.	Aspleniaceae	NCNM
3	<i>Ceratopteris thalictroides</i> L.	Parkeriaceae	NCNM
4	Brongn ??		NCNM
5	<i>Chelianthus mysorensis</i> Wall. ex. Bedd.	Chelianthaceae	NCNM
6	<i>Drymoglossum heterophyllum</i> (L.) Trimen.	Polypodiaceae	NCNM
7	<i>Pterys argyrea</i> Moore	Pteridaceae	NCNM
8	<i>Pterys ensiformis</i> Sm.	Pteridaceae	NCNM

**The List of grasses from ACA
C4 Grasses**

S.No.	Latin Name	Family	Endemics
1	<i>Andropogon lividus</i> Thw.	Poaceae	Endemic.
2	<i>Andropogon polytychum</i> var. polytychum	Poaceae	
3	<i>Andropogon polytychum</i> var. deccanensis	Poaceae	
4	<i>Anthistiria ciliata</i> L.f.	Poaceae	
5	<i>Apocopsis courtallumensis</i> Steud.)Henr.	Poaceae	
6	(<i>Apocopsis wightii</i> Nees.)	Poaceae	
7	<i>Arthraxon villosus</i> C.E.C.Fischer	Poaceae	
8	<i>Arthraxon lanceolatus</i> (Roxb.)Hochst.	Poaceae	
9	<i>Arundinella vaginata</i> Bor.	Poaceae	Endemic.
10	<i>Arundinella purpurea</i> Stued.	Poaceae	Endemic.
11	<i>Arundinella mesophylla</i> nees.	Poaceae	
12	<i>Arundinella ciliata</i> (Roxb)Nees.	Poaceae	
13	<i>Arundinella tuberculata</i> Munro	Poaceae	
14	<i>Bothriochloa parameswaranii</i> Sreekumar et al.	Poaceae	Endemic.
15	<i>Bothriochloa foulkesii</i> (Hook.f.)Henr.	Poaceae	
16	<i>Bothriochloa insculpata</i> (A.Rich.) A.Campus.	Poaceae	
17	<i>Brachiaria reptans</i> (L.)Gard.&C.E.Hubb.	Poaceae	
18	<i>Capillipedium assimile</i> (Steud)A.Camus	Poaceae	
19	<i>Chrysopogon zeylanicus</i> (Stued.)Thw.	Poaceae	
20	<i>Chrysopogon tadulingamii</i> Sreekumar et al.	Poaceae	Endemic.
21	<i>Cyrtococcum deccanense</i> Bor.	Poaceae	
22	<i>Cymbopogon flexuosus</i> (Stued.)Wats.	Poaceae	
23	<i>Cynodon dactyon</i> (Linn.)Pers.	Poaceae	
24	<i>Dichanthium oliganthum</i> (Stued.) Cope.	Poaceae	
25	(<i>D.polytychum</i>)	Poaceae	
26	<i>Dichanthium foulkesii</i> (Hook f.)Jain and Despande.	Poaceae	
27	<i>Digitaria wallichiana</i> (Stued.)Stapf.	Poaceae	
28	<i>Eleusine indica</i> (Linn.) Gaertn.	Poaceae	
29	<i>Eragrostis unioides</i> (Retz.)Stued.	Poaceae	
30	<i>Eragrostis pilosa</i> (Linn) P.Beauv.	Poaceae	
31	<i>Eragrostis nigra</i> Steud.	Poaceae	
32	<i>Eulalia phaeothrix</i> (Hack)O.Kunz.	Poaceae	
33	<i>Eulalia thwaitesii</i> (Hack)O.Kuntze	Poaceae	
34	<i>Eulalia trispicata</i> (Schult)Henr.	Poaceae	

S.No.	Latin Name	Family	Endemics
35	<i>Heteropogon contortus</i> (Linn.)Roem & Shultz.	Poaceae	
36	<i>Imperata cylindrica</i> (Linn.)Raeusch.	Poaceae	
37	<i>Ischaemum tadulingamii</i> N.C.Nair et al.	Poaceae	
38	<i>Ischaemum commutatum</i> Hack.	Poaceae	
39	<i>Ischaemum indicum</i> (Houtt.) Merrill.	Poaceae	
40	<i>Ischaemum nilagiricum</i> Hack.	Poaceae	
41	<i>Shima nervosum</i> (Rottl.)Stapf.	Poaceae	
42	<i>Setaria pumila</i> (Poir)Roem.&Schlt.	Poaceae	
43	(<i>S. glauca</i> Senu Hook f.)	Poaceae	
44	<i>Setaria pallide</i>	Poaceae	
45	<i>Themeda tremula</i> (Stued.)Hack.	Poaceae	
46	<i>Themeda cymbaria</i> (Roxb.)Hack.	Poaceae	
C3 Grasses			
47	<i>Tripogon bromoides</i> Roem & Schult.	Poaceae	
48	<i>Tripogon narayanii</i> Sreekumar et al.	Poaceae	Eendemic
49	<i>Tripogon anantaswamianus</i> Sreekumar et al.	Poaceae	Eendemic
50	<i>Zenkeria jainii</i> N.C.Nair et al.	Poaceae	Eendemic
51	<i>Zenkeria elegans</i> Trin.	Poaceae	
52	<i>Agrostis peninsularis</i> Hk.f.	Poaceae	Eendemic
53	<i>Agrostis pilosula</i> Trin.	Poaceae	
54	<i>Jansenella griffithiana</i> (C.Muell.)Bor.	Poaceae	
55	<i>Oplismenus compositus</i> (Linn.)P.Beauv.	Poaceae	
56	<i>Panicum gardneri</i> Thw.	Poaceae	
57	<i>Paspalidum punctatum</i> (Burm.)A.Camus.	Poaceae	
58	<i>Poa annua</i> Linn.	Poaceae	
59	<i>Sacciolepis indica</i> (Linn.)A.Chase	Poaceae	
60	(<i>Aira indica</i>)	Poaceae	
61	<i>Isachne setosa</i> C.E.C.Fischer.	Poaceae	
62	<i>Isachne fischeri</i> Bor.	Poaceae	Eendemic.
63	<i>Isachne bourneorum</i> C.E.C.Fischer.	Poaceae	Eendemic.
64	<i>Garnotia exaristata</i> Gould.	Poaceae	
65	<i>Garnotia courtellensis</i> (Arn.& Nees)Thw.	Poaceae	
66	<i>Helictotrichon virescens</i> (Stued)Henr.	Poaceae	
67	<i>Coelachne simpliciuscula</i> (stued.)Benth.	Poaceae	
68	<i>Coelachne perpusilla</i> (Stued.),Thw.	Poaceae	

Appendix - 2.2 List of Medicinal plants of the Anamalai Conservation Area

S. No.	Latin Name	Common Name	Family
1	<i>Abutilon ramosum</i> (Cav.) Guill. &Perr.	Kangi(Hindi)	Malvaceae
2	<i>Acacia concinna</i> DC.	Shekkoy	Mimosaceae
3	<i>Acacia instia</i> Willd.	Indu	Mimosaceae
4	<i>Acacia torta</i> (Roxb.) Craib.	NIL	Mimosaceae
5	<i>Achyranthus aspera</i> L.	NIL	Amaranthaceae
6	<i>Achyranthus bidentata</i> BL	NIL	Amaranthaceae
7	<i>Acronychia pedunculata</i> (L) Miq)	NIL	Rutaceae
8	<i>Adenia hondala</i> (Gaertn) de Wilde		Passifloraceae
9	<i>Alangium salvifolium</i> (L.F) Wang.	NIL	Alangiaceae
10	Subsp. <i>hexapetalum</i> (Lam.) Wang.		
11	<i>Albizzia amara</i> Boiv.	Alinhi	Mimosaceae
12	<i>Alternanthera sessilis</i> R.Br.	NIL	Amaranthaceae
13	<i>Alternanthera tenella</i> Colla	NIL	Amaranthaceae
14	<i>Amorphophallus paeonifolius</i>	NIL	Araaceae
15	<i>Andodendron paniculatum</i> DC	NIL	Apocyanaceae
16	<i>Andodendron rhinosporum</i> Thw	NIL	Apocyanaceae
17	<i>Andrographis macrobotrys</i> Nees	NIL	Acanthaceae
18	<i>Anogeissus latifolia</i> (Roxb.ex.DC)	Vekkali	Combretaceae
19	<i>Arbrus precatorius</i> Linn.	kundumani	Fabaceae
20	<i>Artocarpus hetrophylla</i> ??	Satavari	Moraceae
21	<i>Artocarpus integrifolia</i> Linn.f.	Peipila, Aini	Moraceae
22	<i>Asclepias carasavica</i> . L	NIL	Apocyanaceae
23	<i>Asparagus racemosus</i> Willd	Kurundu	Liliaceae
24	<i>Berberis tinctoria</i> Lesh.	NIL	Berberidaceae
25	<i>Bombax ceiba</i> L.	Elavam	Bombacaceae
26	<i>Calaotropis gigantia</i> Br.	ceae	Asclepiadaceae
27	<i>Calicarpa tomentosa</i> Willd	NIL	Verbenaceae
28	<i>Canarium strictum</i> Roxb.	Karinkungilium	Burseraceae
29	<i>Cardiospermum helicacabum</i> L.	NIL	Sapindaceae
30	<i>Casearia zylanica</i> Thw.	NIL	Flacourtiaceae
31	<i>Cassia absus</i> L.	NIL	Caesalpiaceae
32	<i>Cassia hirsuta</i> L.	NIL	Caesalpiaceae
33	<i>Cassia occidentalis</i> L	Ponnavaram	Caesalpiaceae
34	<i>Cassia tora</i> L.	Thangarai	Caesalpiaceae
35	<i>Celastrus paniculatus</i> Willd.	NIL	Celasteraceae
36	<i>Centalla asiatica</i> (L.) Urben	NIL	Apiaceae
37	<i>Cipadessa baccifera</i> (Roth) Miq	NIL	Meliaceae
38	<i>Clausena heptaphylla</i> (Roxb.) W. &. A.		Rutaceae
39	<i>Clausena indica</i> (Dalz.) Oliver		Rutaceae

S. No.	Latin Name	Common Name	Family
40	<i>Clausena pentaphylla</i> (Rext.) DC		Rutaceae
41	<i>Clausena willdenovii</i> W. & A.	Odugin, Oduvai	Rutaceae
42	<i>Clematis gouriana</i> Roxb.	Chiruthelek	Ranunculaceae
43	<i>Clematis wightiana</i> Wall.	NIL	Ranunculaceae
44	<i>Clerodendron serratum</i> Spreng.	Kudirai pudukuannu	Verbenaceae
45	<i>Coleus malabaricus</i> Benth	NIL	Lamiaceae
46	<i>Cordia obliqua</i> Willd	NIL	Asclepiaceae
47	<i>Cordia wallachai</i> G Den	Mavalingum	Asclepiaceae
48	<i>Curculigo orchioides</i> Gaertn.	NIL	Hypoxidaceae
49	<i>Curcuma pseudomontana</i> Grah.	NIL	Zingiberaceae
50	<i>Curcuma vamna</i> Sabu & Mangaly	NIL	Zingiberaceae
51	<i>Curcuma zeodoria</i> (Christm.) Roscoe	NIL	Zingiberaceae
52	<i>Cyanthum callialatum</i> Buch Ham Wt & Arn	NIL	Asclepiaceae
53	<i>Cyathula prostrata</i> (L) Bl.	NIL	Amaranthaceae
54	<i>Cyclea arnottii</i> Miers	NIL	Menispermaceae
55	<i>Cyclea fissicalyx</i> Dunni	NIL	Menispermaceae
56	<i>Dalbergia sisoides</i> Grah.	NIL	Fabaceae
57	<i>Datura stramonium</i> L.	NIL	Convovulaceae
58	<i>Dioscorea pentaphylla</i> L.	NIL	Dioscoreaceae
59	<i>Dolichos trilobus</i> L.	NIL	Fabaceae
60	<i>Dysoxylum binectariferulum</i> Hook. f.	NIL	Meliaceae
61	<i>Dysoxylum malabaricum</i> Bedd.ex Hiern	NIL	Meliaceae
62	<i>Elephantopus scaber</i> L.		Asteraceae
63	<i>Elettaria cardamomum</i> Maton	Elavam	Zingiberaceae
64	<i>Emblina officinale</i> Gaertn	Nelli	Euphorbiaceae
65	<i>Emilia scabra</i> DC	NIL	Asteraceae
66	<i>Entada scandense</i> Benth.	Thellikkakodi	Mimosaceae
67	<i>Erythrina indica</i> Lam.	Mullumurukku	Fabaceae
68	<i>Erythrina stricta</i> L.	NIL	Fabaceae
69	<i>Eucalyptus globulosus</i> Labill.	Karpuram	Myrtaceae
70	<i>Globba ophioglossa</i> Wt.	NIL	Zingiberaceae
71	<i>Gloriosa superba</i> L.	NIL	Liliaceae
72	<i>Gmelina arborea</i> Roxb.	Kumil	Verbenaceae
73	<i>Hadina cordifolia</i> (Roxb. Ridsdale	NIL	Rubiaceae
74	<i>Helecteres isora</i> L.	Valmburi	Tiliaceae
75	<i>Hemidesmus indicus</i> (L) R. Br.	Nannari	Asclepiaceae
76	<i>Hibiscus furcatus</i> Roxb.	NIL	Malvaceae
77	<i>Hibiscus surattensis</i> L.	NIL	Malvaceae
78	<i>Hydnocarpus laurifolia</i> (Dennst) Selumer	NIL	Flacourtiaceae
79	<i>Hymenodictyon orixense</i> (Roxb.) Mabblerley	NIL	Rubiaceae
80	<i>Indigofera constricta</i> (Trimen) Thw.	NIL	Fabaceae

S. No.	Latin Name	Common Name	Family
81	<i>Indigofera spicata</i> Forskk.	NIL	Fabaceae
82	<i>Indigofera wightii</i>	NIL	Fabaceae
83	<i>Ixora cuneifolia</i> Roxb.	NIL	Rubiaceae
84	<i>Ixora nigricans</i> R. Br.	NIL	Rubiaceae
85	<i>Ixora parviflora</i> Vahl.	Kora	Rubiaceae
86	<i>Ixora pavetta</i> Andr.	NIL	Rubiaceae
87	<i>Jistocoe gendursoa</i>	NIL	Acanthaceae
88	<i>Kalanchoe lanceolata</i> (Forsk.) Pers.	NIL	Crassulaceae
89	<i>Knema attenuata</i> (Wall.ex.	NIL	Myristicaceae
90	<i>Lagascea mollis</i> cav.	NIL	Asteraceae
91	<i>Lagestromia microcarpa</i> Wt.	NIL	Lythraceae
92	<i>Lagestromia reginae</i> Roxb.	NIL	Lythraceae
93	<i>Leea indica</i> (Burm.f.) Merr	NIL	Leeaceae
94	<i>Mangifera indica</i> L.	Mamaram	Anacardiaceae
95	<i>Mimosa pudica</i> L.	NIL	Mimosaceae
96	<i>Mimusops elongi</i> L	Magilan	Sapotaceae
97	<i>Mitracarpus villosus</i> (Sw.)DC	NIL	Rubiaceae
98	<i>Mitragyna parvifolia</i> (Roxb.) Korth	NIL	Rubiaceae
99	<i>Mollugo pentaphylla</i> L.	NIL	Molluginaceae
100	<i>Momordia dioica</i> Roxb.	NIL	Cucurbitaceae
101	<i>Murraya paniculata</i> (L)jack	NIL	Rutaceae
102	<i>Mussanda hirsutissima</i> ??	NIL	Rubiaceae
103	<i>Myristica laurifolius</i> Hk.f&T	Jathikai	Myristicaceae
104	<i>Ocimum sanctum</i> L.	Thualsi	Lamiaceae
105	<i>Ocimum gratissimum</i> L.	NIL	Lamiaceae
106	<i>Oxalis corniculata</i> L.	NIL	Oxalidaceae
107	<i>Pancratium triflorum</i>	NIL	Amaryllidaceae
108	<i>Phyllanthus missionais</i> hook.f.	NIL	Euphorbiaceae
109	<i>Phyllanthus rheedii</i> Wt.	NIL	Euphorbiaceae
110	<i>Phyllanthus urinaria</i> L.	NIL	Euphorbiaceae
111	<i>Piper galeatum</i> DC	NIL	Piperaceae
112	<i>Piper hymenophyllum</i> Miq.	NIL	Piperaceae
113	<i>Piper trioicum</i> Roxb.	NIL	Piperaceae
114	<i>Pogostemon benghalensis</i> (Brum.f.) O.Kuntze	NIL	Lamiaceae
115	<i>Potulaca oleracea</i> L.	NIL	Portulacaceae
116	<i>Potulaca pilosa</i> L.	NIL	Portulacaceae
117	<i>Premna tomentosa</i> willd	Kolakkattai thekku	Verbenaceae
118	<i>Radermachera xylocarpa</i> (Roxb.) K.Schum	NIL	Sorophulariaceae
119	<i>Rauvolfia serpentina</i> 9L) Benth. ex	NIL	Apocyanaceae
120	<i>Rauvolfia tetraphylla</i> L	NIL	Apocyanaceae
121	<i>Rubia cordifolia</i> L	NIL	Rubiaceae

S. No.	Latin Name	Common Name	Family
122	<i>Santalum album</i> L.	Sanadana maram	Santalaceae
123	<i>Scolopia crenata</i> Clos.	NIL	Flacourtiaceae
124	<i>Scoparia dulcis</i> L.	NIL	Sorophulariaceae
125	<i>Sida beddomei</i> K.C.Jacob	NIL	Malvaceae
126	<i>Sida glutinosa</i> Commers.ex. Cav.	NIL	Malvaceae
127	<i>Solanum giganteum</i> Jacq	NIL	Asclepiaceae
128	<i>Solanum melongena</i> L Var insanuam (L)Prain	NIL	Asclepiaceae
129	<i>Solanum torvum</i> Swartz	NIL	Asclepiaceae
130	<i>Stachyphrynium spicatum</i> (Roxb.) Schum	NIL	Zingiberaceae
131	<i>Stereospermum colais</i>	NIL	Sorophulariaceae
132	<i>Sterulia guttata</i> Roxb.	NIL	Stelculiaceae
133	<i>Syzygium arnotianum</i> Walp.	Njaval	Myrtaceae
134	<i>Syzygium fergusonii</i> (Trimen) Gamble	NIL	Myrtaceae
135	<i>Syzygium gardeneri</i> THw.	NIL	Myrtaceae
136	<i>Syzygium hemisphericum</i> (Wt.) Alston	NIL	Myrtaceae
137	<i>Syzygium lanceolatum</i> (Lam.) Wt. & Arn.	NIL	Myrtaceae
138	<i>Tabermontana heyneana</i> Wall.	Nandivattai	Apocynaceae
139	<i>Terminalia crenulata</i> Wall.ex Guill & Perr	NIL	Combretaceae.
140	<i>Terminalia paniculata</i> Roth.	Adamarudu, Pillamaru	Combretaceae.
141	<i>Terminallia bellerica</i> Roxb.	Tanni	Combretaceae.
142	<i>Terminallia chebula</i> Retz.	Kadukkai	Combretaceae.
143	<i>Topocarpus palghatensis</i> Gamble	NIL	Asclepiaceae
144	<i>Vitex negundo</i> Linn.	Nochi	Verbenaceae
145	<i>Vitis</i> sp.	NIL	Vitaceae
146	<i>Wrightia arborea</i> (dennst)Mabberley	NIL	Apocyanaceae
147	<i>Wrightia tinctoria</i> (Roxb) R, Br.	Palai	Apocyanaceae
148	<i>Zehneria maysorensis</i> (Wt.& Arn.) Azn.	NIL	Cucurbitaceae
149	<i>Zingiber officinalis</i> Rosc.	Ingi	Zingiberaceae
150	<i>Zingiber purpureum</i> Roscoe	NIL	Zingiberaceae
151	<i>Ziziphus oenoplea</i> (L) Mill.	NIL	Rhamnaceae
152	<i>Ziziphus rugosa</i> Lam.	Kattilandai	Rhamnaceae

Chapter 3

Terrestrial and Aquatic Wildlife

3.1 Status and Trends of Species of Concern

Owing to the extreme variation in climate, vegetation and topography, the ACA harbours an enormous diversity of habitat types and consequently its fauna. Almost all the south Indian faunal genera, (mammals, birds, reptiles, amphibians, fishes, butterflies & insects) have their representatives in the area.

3.1.1 Mammals

Out of 51 mammalian species till now reported from ACA, 14% (7 species) are endemic to the Western Ghats. Three species are listed as endangered, and eleven species are listed as vulnerable by the IUCN Red Data book. The rest of the group is considered as lacking in information for the time being (See appendix). The most endangered mammals in the ACA include Lion Tailed Macaque, Nilgiri Tahr, Nilgiri Marten and Travancore Flying Squirrel.

Lion Tailed Macaque is described as one of most beautiful of the Macaques. It is facing extinction due to habitat loss. It is a medium sized macaque with a black coat and a greyish white mane and tufted tail very similar in shape to the mane and tufted tail of the lion and hence the name Lion Tailed Macaque. Some authors have suggested Lion Faced Macaque also for its mane. It inhabits the Evergreen and semi-evergreen rain forests. It also occurs in Coffee-Cardamom plantations near the rain forests. Its food mainly consists of fruits, seeds, flowers and insects.

Nilgiri Langur is another one of the endemic mammals of the Western Ghats. Due to its generalist behavior it enjoys a widespread distribution. It is a glossy black langur with buff colored facial hairs. It is seen in all the habitat types of the ACA. It subsists mainly on the leaves but also eats flowers, fruits, shoots and buds.

Tiger, the National animal of the country, locally called as *Vengai puli* is the largest predator of the ACA. It has brownish yellow coat with vertical black stripes. It preys on deer, gaur, langur, wild boar, cattle and occasionally on jungle fowls. It is seen in all the habitat types of the area except for the highly disturbed areas. It remains very elusive and sightings are infrequent in the field.

Panther or leopard locally called, as the *Pullipuli* is the second largest predator of the ACA. This is one of the most beautiful cats of the world; it has a reddish yellow coat with small close-set rosettes. Melanic black leopards are occasionally seen. It preys on a variety of animals including cattle, monkey, deer, porcupine, birds, reptiles and crabs. It climbs trees and catches prey larger than itself carrying them to the top of the trees to eat in peace. It is a generalist seen in all types of habitats including human settlements or artificial habitats.

Striped hyena— There are scanty reports about the sightings of hyenas from the Udumalpet range of Indira Gandhi WLS of the ACA; it has to be confirmed through proper surveys. It is basically an

animal of open habitats and nocturnal in its habits. Even though said to be scavengers, studies from other parts of the country prove that they are active predators too (ongoing studies in the Kuchch by WII).

Wild Dog — These are very similar to the domestic dogs with brick red coat and a black tinged tail. They are locally called *Chennai*. They are social animals and are seen in all the habitat types of the ACA. They are famous for their tenaciousness and ferocity. They usually prey on deer and wild boar, but they will also attack larger mammals like gaur and elephants if the pack is large enough and other prey are scarce.

Gaur, locally called, as *Kattu madu* is the second largest herbivore of the ACA. It attains a height of 175-220cm at the shoulder. It is the largest of all the bovines, with a heavy body, short limbs and elevated hump like ridge of shoulder. Older bulls are black and hairless where as the females and juveniles are dark or reddish brown in colour with short hairs and white stockings. They are usually seen in herds of 5-20 individuals. They are essentially animals of hilly tracks and are rarely reported from the lower elevations.

Nilgiri Tahr locally called as *Vārai aadu* is seen in the higher elevation - Shola Grassland systems of the ACA. They have a coat of dark yellowish brown dorsal colouration, which slowly merges in to the lower pale whiteness in adult condition of females. Older bucks are almost blackish brown in colour with a distinct saddle patch hence the name 'Saddle back'. A pale streak runs from each ear down the side of the muscle and a light coloured ring surrounds each eye.

The most preferred habit of the Nilgiri Tahr is the open terrain, cliffs and grass-covered hills. They feed on a variety of plants particularly herbs, shrubs and

grasses. Nilgiri Tahr is very significant animal from the biogeographical point of view. The isolated distribution of this wild goat, so far south of the usual range, is taken to indicate the existence of temperate climate in this part of the country at some remote epoch of the earth's history, which must have enabled the Tahr to inhabit this area (Prater 1980). Its only wild relative in India is the Himalayan Tahr, *Hemitragus jamlahicus* (H. Smith, 1826), a species that is found only in the Western and the Central Himalayas.

Grizzled Giant squirrel — This species is seen in the Amaravathi range of the ACA. They are commonly known as the *Perianathan* in the Tamil language. Even though they are reported to be present in hill forests at an altitudinal range of 200- 2300m from the MSL, the big chunk of the population is restricted to the Dry scrub and Dry deciduous forest type of the lower hillsides. They are diurnal and arboreal, but not much is known about their ecology. They feed on fruits, nuts, leaves and bark.

Other mammals — not much is known about the smaller cats, civets and other smaller mammals of the ACA, including the jungle cat, fishing cat, leopard cat, small Indian civet, toddy cat and mongooses (see Appendix 3.6). There is much confusion about even the identification characteristics of these small mammals especially the flying squirrels. Flying squirrels are nocturnal in their habits and are secretive and elusive in their habits, which makes the identification in the field very difficult.

Table 3.1 & 3.2 represents the summer and winter densities of different mammals taken on the basis of pellet groups/dung piles per hect.

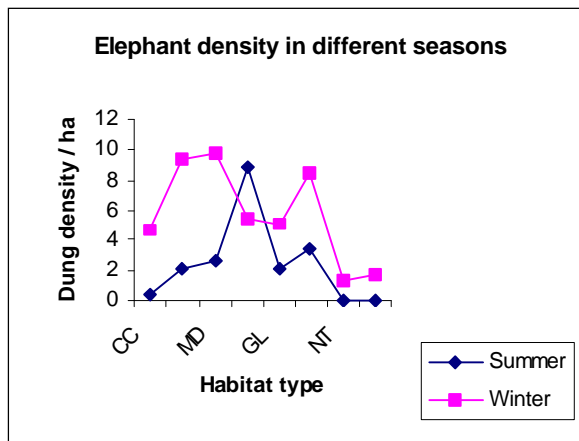
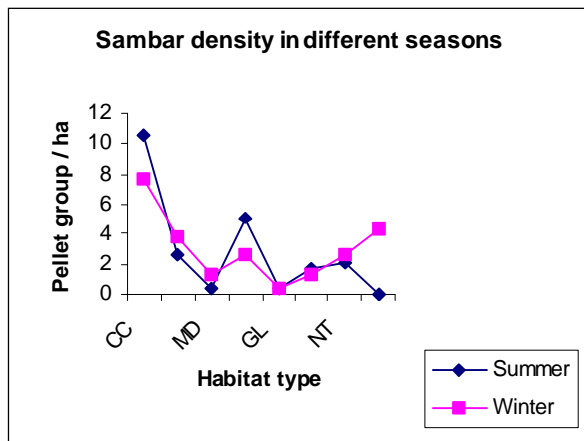
Table 3.1 - Summer densities, pellet groups/dung piles/ha of mammals in ACA

Sp/ Habitat	Coffee Cardamom	Dry Deciduous	Moist Deciduous	Evergreen forests	Grass- lands	Montane Shola	Non- Teak
Sambar	10.6157	2.5477	0.42446	5.0955	0.42463	1.6985	2.1231
Bison	1.2738	5.0955	4.2462	1.6985	0.8492	0.8492	5.5201
Sloth Bear	0.8492	-	-	-	-	-	-
Mouse Deer	-	-	-	-	-	-	-
Elephant	0.4246	2.1231	2.5477	8.9172	2.1231	3.3970	-
Wild Boar	-	2.5477	-	0.8492	-	-	-
Bark. Deer	-	1.6985	-	2.5477	0.42463	0.8492	-
Tahr	-	-	-	-	-	-	-

Table 3.2- Winter densities, pellet groups/dung piles/ha of mammals in ACA

Sp/ Habitat	Coffee Cardamom	Dry Deciduous	Moist Deciduous	Evergreen forests	Grass- lands	Montane Shola	Non- Teak	Other
Sambar	7.64331	3.82166	1.2738	2.5477	0.4246	1.2738	2.5477	4.2462
Bison	1.27389	8.49257	5.5201	11.0403	1.2738	2.9724	11.0403	3.3970
Sloth Bear	2.54777	-	-	-	-	-	-	-
Mouse Deer	2.12314	-	-	-	-	-	-	-
Elephant	4.67091	9.34183	9.76645	5.5201	5.0955	8.4925	1.2738	1.6985
Wild Boar	-	7.21868	1.6985	1.6985	-	-	5.0955	2.1231
Bark. Deer	-	3.39703	-	4.2462	-	8.4926	-	1.6985
Tahr	-	-	-	-	1.6985	-	-	-

Fig 3.1 & 3.2 showing density of major mammals of ACA fluctuating in different habitats according to different seasons



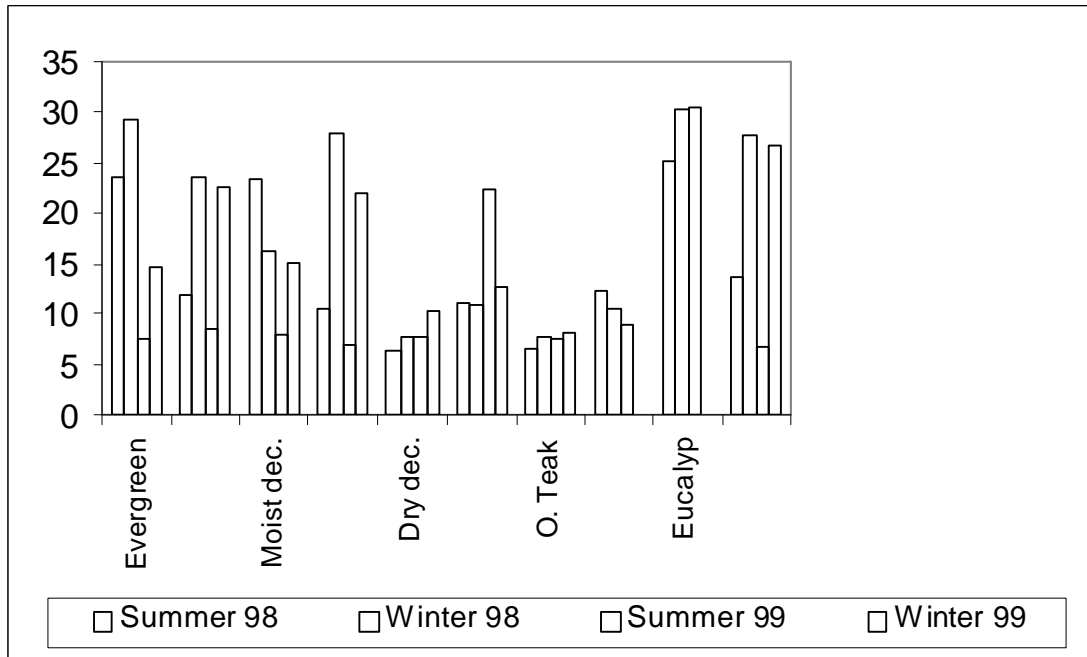
3.1.2 Avifauna

ACA supports a rich avifauna. A total of 42 families and 260 species have been reported from the ACA till now. The highest number of species are from the family Muscipidae (54) followed by Accipitridae (23), and Cuculidae (12). Eight families are represented by single species. In the ACA there are 28 species having patchy/local pattern of distribution and 3 species of very rare pattern. A total of 16 bird species were added to the existing list of birds of the area during the study, with two species being endemic to the Western Ghats (Nilgiri Wood Pigeon & Nilgiri Laughing Thrush) and one species being of endangered status (Peregrine Falcon).

An analysis of distribution of different bird species in different areas yielded very interesting results. Transect data were analysed using the program DISTANCE Software. The data of different seasons were analysed separately. It can be seen that winter densities of bird species are generally high in most vegetation types. This may be due to the addition in species as winter visitors and local migrants. A comparison of winter

densities shows that Eucalyptus plantation, Evergreen Forest type and Coffee Plantation have very high density of birds. The Eucalyptus Plantation were higher in density of birds in other seasons as well (Fig. 3.3). The high density of birds in the Eucalyptus plantations can be due to an excess growth of shrubs and herbs because of the very large openings created during the removal of the trees. There are unpenetrable thickets of thorny bushes growing in the Eucalyptus as undergrowth, since no tending operations are going on and there is no control on the growth of these bushes except for the damage caused by the elephants feeding on these. Most of these shrubs bear berries, which are preferred by the birds. This availability of fruits, insects associated with the shrubbery undergrowth attract all sorts of birds from the neighbouring habitats as well. The Eucalyptus Plantation also acts as a passage between Dry deciduous Forest, Moist Deciduous Forest, Disturbed Dry deciduous Thorn forest and also between the human habitations and the natural habitats. There may be an edge effect and thus an expected increase in species diversity.

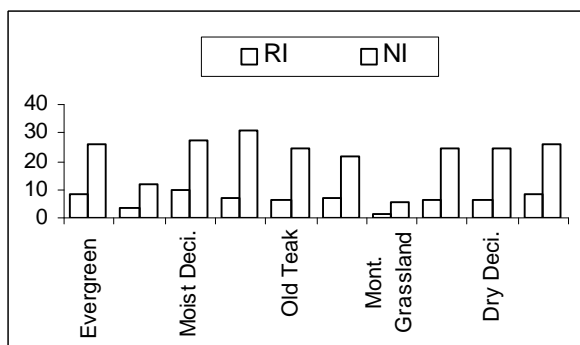
Fig. 3.3 Density/sq. km. of birds in different vegetation types and seasons



Eucalyptus Plantation, Old Teak Plantation and the Dry Deciduous Forest did not show much density variation in winter and summer densities, but the Montane Shola, Grassland and Evergreen Forest showed a great variation in the summer and winter densities (Fig. 3.4).

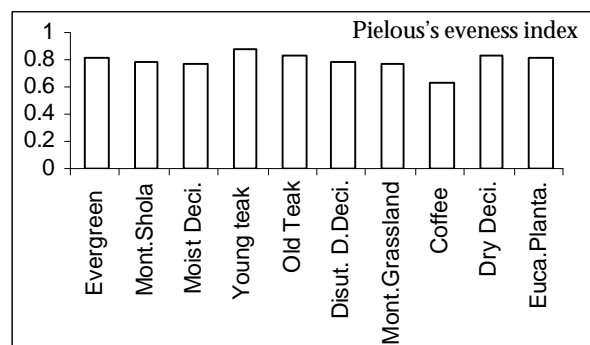
The Young Teak Plantations showed a maximum diversity in bird species followed by the Moist Deciduous Forest. The Evergreen and Eucalyptus Plantation showed identical values for Marglef's Richness index (Fig. 3.4), Shannon-Wiener Diversity Index (Fig. 3.4) and Pielou's evenness Index (Fig. 3.5).

Fig. 3.4 Diversity indices for birds in different vegetation types



RI = Margalef's Richness
NI = Shannon-wiener Diversity

Fig. 3.5 Evenness indices for the birds in different vegetation types



A comparison of the avian communities of these two vegetation types using the Sorensen's similarity indexes showed that they are very different from each other. Only 12.6% of both the communities were similar, which constitute the generalists of the species complex. The bird communities of the Dry Deciduous Forest and Young Teak Plantation were very similar in species composition and Young Teak Plantation was also similar to the Moist Deciduous forest. This similarity of Young teak and the Moist Deciduous Forest and the Dry Deciduous Forest can be well explained by the edge effect itself. Disturbed Dry Deciduous Forests of lower elevation and the Eucalyptus plantations showed a very high similarity in bird communities. Both these vegetation types are adjacent to each other and similar altitude and climatic conditions explains the extreme similarity.

Residency status of the birds

Based on the residency status, the birds were broadly classified into resident and migrant and the resident category was further split into five groups namely true residents, local migrants, altitudinal migrants, endemics and nomads. Similarly the migrants were split into two categories, namely true migrants and occasional migrants. Occasional migrants are those who come occasionally. Local migrants are those birds moving locally depending on the weather conditions and availability of food. The strategy for the conservation of residents differ from that of migrants because of the breeding and habitat requirements.

Numerical status and texture of distribution

The numerical status looks at the grade of commonness and texture of distribution is the way they are distributed in their range. For example, some species are patchy/widespread / abundant in their distributional range. In the ACA there are 28 species which indicated patchy /local pattern of distribution and 3 species were very rare in their given range.

Habitat preference of species

The vegetation was broadly divided into seven classes,

namely scrub, dry deciduous, moist deciduous, semi evergreen, evergreen, grasslands and shola grassland. Based on the use of habitat spectrum grading of their habitat use was attempted. For 33 species there is no information available in Salim Ali's Handbook. There were nine scrub specialists, three dry deciduous specialists, four moist deciduous specialists, one semi evergreen specialist, 27 evergreen specialists, 7 grassland specialists and one shola grass land dwelling species. All other species used between 2 to 6 habitats out of the seven identified in the ACA in different combinations. Thus the habitat usage pattern ran like this; one species using six habitats, five species using five habitats, 35 species using four habitats, 73 species using three habitats, and 41 species using two habitats. The most important areas in terms of species richness were moist deciduous, semi evergreen, evergreen and dry deciduous biotypes.

There are a variety of man made habitats such as plantations of teak, cardamom, rubber, tea, and coffee; orchards, groves, cultivation and clearings in the vicinity of human habitations. Out of the 243 species, around 57% occurred in these habitat types. Approximately 33% of the total were found in cultivation areas and near human habitations. These obviously were versatile species with a wide range of adaptations.

Altitude based distribution

An analysis of the pattern of distribution along altitudes indicated that the majority of the species occurred between the 100-1200 m range. The number of species fell rapidly with increase in altitude beyond 1200 m.

Vertical distribution

Out of the 182 species for which such information was available, 73 species were canopy species and 38 species were ground users. Others used sub-canopy bush-undergrowth spectrum. Only one species was found going across all the vertical layers. Older successional stage were therefore important in maintaining bird diversity.

Feeding guilds

The species reported from this area fell into 7 major feeding guilds. These were granivore, frugivore, nectarivore, insectivore, (128spp). One species fed mostly on snakes; one mostly on rodents and four preyed on other birds.

3.1.3 Reptiles

Reptiles are highly diverse in their morphological patterns and ecological requirements. The Order Squamata has 3 important taxa- the Geckos, the Skinks and the Agamids. As per the study on “Impact of rain forest fragmentation on Herpetofauna in the western ghats” by SACON, WII and USFWS, a total of 40 species have been recorded from the Anaimalai hills. It has been observed that while skinks and geckos dominated the leaf litter assemblage in the rain forest patches, agamids dominated the arboreal assemblage. The study reports for the over all density of floor reptiles in the forest fragments as 148 animals /ha while the encounter of arboreal reptiles has been reported as 1.84 animals /250 m. Although species richness was highly correlated with the forest fragments, the density of floor reptiles was related to different habitat features, especially those caused by human disturbance and the same exhibited a positive effect on reptile abundance.

3.1.4 Amphibians

A total of 47 amphibians have been reported from the ACA. No extensive studies have taken place in the ACA to make the picture clearer. The ecology and habits of amphibians need special attention as per the dissertation work by Saravanakumar 1996. It is still interesting to note that 64% (30sp.) are endemic to the Western Ghats. The genus *Indirana* with all its members are endemic to the Western Ghats. Two species are listed as Endangered by the IUCN, 16 species as vulnerable, 26 species as Low Risk near threatened and two species lack information (See App.3.3). The majority amphibians are included

in the Schedule-IV of the Wildlife protection Act 1972.

As per the study carried out on “Impact of rain forest fragmentation on herpetofauna in the western ghats” by SACON, WII & USFWS, a total of 40 species were recorded from rain forest fragments in the Anaimalai Forest hills. It has been concluded that the habitat disturbance has negative impact on the species richness in the rain forest fragments. The densities of different genera have been correlated with the different habitat features, especially disturbance indicating the need for active management of these critical rain forest fragments. The occurrence of many amphibian species in the rain forest fragment depends on periodic recolonization from adjoining large undisturbed forest patches and the probability of recolonization is quite low due to surrounding tea plantation areas. However, the scenario may change with the change in the land use pattern in the plantation crop.

3.1.4 Fishes

There are 28 fish species reported from the ACA. Out of these 28 species, 18 (64%) are endemic to the Western Ghats. Three species are exotic and 7 species are non-endemic.

Instream conditions and Fish diversity

Management of riparian systems for the conservation of fish fauna has not received much attention in India from ecologists and managers. It is true that fish fauna have been of interest to the Department of Fisheries but fishes that are of less value to fisheries have been more or less neglected. Certain groups of fishes are adapted to live in strong currents and along steep rocky surfaces of hill streams. For example, the members of subfamilies Garrinae and Balitorinae of families Cyprinidae and Balitoridae respectively are highly specialized fishes with structural adaptations. Since they are specialists, they are also vulnerable. Studies on the systematics and distribution of hill stream fishes have received little attention. However,

recently there are some studies taken up with the objective of their conservation (Das H.S. 1986: Ajithkumr, 1995 Personal communications). Within this project a survey of the fish fauna of the Anaimalai Conservation Area was initiated with an aim of listing fish species, collate information on their behaviour and habitats, and thus set out the management requirements.

The study area comprises of Indira Gandhi Wildlife Sanctuary and Dindigul and Kodaikkanal forest divisions, representing a range of forest types under the Champion and Seth's (1968) classification (Ponnuswamy, 1974). These are: the dry deciduous forests, moist deciduous forests, evergreen forests, semi evergreen forests, scrub forests, montane shola forests and montane grasslands. The dam areas included Parambikulam-Alyiar, Tirumurthi, Amaravathi, Nirar and Kadapara dams. Most of the rivers are inter-connected through tunnels and some of them were forced to change direction via these dams. These changes certainly have significantly altered the distribution of fishes.

Experimental Procedures

Habitats were classified into different categories using Nelson's System (Talwar and Jhingran 1991) with some modifications. Sampling sites were selected at random and two gears, cast net and a locally fabricated spread net was used to sample the fish fauna because of the habitat peculiarity and fish species avoidance of certain type of gears.

The spread net was used for catching fishes along rocky areas and slushy puddles where cast net could not be operated because of lack of depth. Moreover, the species that are oriented to rocky habitats cannot be caught by any other methods. Ocular observations were also made wherever possible, to identify and enumerate the fish species. This was necessary as some species avoided both the gears. Some important chemical and physical parameters were also taken like DO, pH and water velocity from the sampling sites.

Results and discussion

Twenty-three sites were sampled in different rivers in Indira Gandhi Wildlife Sanctuary. A total of 28 species belonging to 20 genera and 10 families were recorded (Annexure 3.2). Out of these *Cyprinus carpio communis*, *Salmo gairdnerii garidnerii* and *Oreochromis mossambica* were exotic. Two species had wide distribution in India. Thirteen species were endemic to Western Ghats and two to south India. Besides these, two species occur in Sri Lanka as well. Five species were known to occur outside India in other countries. A single *Mystus armatus* has discontinuous distribution.

Status:

1. Introduced (exotic) 1, 22, 26
2. Endemic to Western Ghats 2, 7, 8, 9, 11, 15, 16, 17, 20, 21, 24
3. South India: 3, 5, 6, (endangered) 14, 15, 25.
4. All India: 13, 23.
5. Discontinuous: 19 (Western Ghats and Nagaland)

WHR Matrix Format

Scientific name	<i>Subgroup 5B Northern Tropical Dry Deciduous Forests</i>
Vernacular name	Type 5B/c1c Dry peninsular sal forests
Taxonomic class	Type 5 DS2 Dry Deciduous Scrub
Legal Status - Wildlife Protection Act	Type 5/Is2 Khair and Sissoo Forests
Legal Status - CITES	Type 5/Is3 Babul forests
Conservation status - IUCN	Type 5E2 Boswellia Forests
Endemism status	Type 5/E4 Hardwickia forest
Residency status	Type 5/Is1 Dry Tropical riverain forest
Conservation area	Group 6 Tropical Thorn Forests
Abundance / distribution status	<i>Subgroup 6A Southern Tropical Thorn Forests</i>
Conflict with humans	Group 7 Tropical Dry Evergreen Forests
CHAMPION AND SETH CLASSES	Group 8 Subtropical Broad-leaved Hill Forests
Group 1 Tropical Evergreen Forests	<i>Subgroup 8B Northern Tropical broad-leaved Wet Hill Forests</i>
<i>Subgroup 1A Southern Tropical Wet Evergreen Forests</i>	Type 8A/c3 Central Indian subtropical hill forests
<i>Subgroup 1B Northern Tropical Wet Evergreen Forests</i>	Group 11 Montane Wet Temperate Forests
Group 2 Tropical semi-evergreen forests	<i>Subgroup 11A Southern Montane Wet Temperate Forests</i>
<i>Subgroup 2A Southern Tropical Semi-evergreen forests</i>	Type 11A/c1 Southern Montane Wet Temperate Forests
<i>Subgroup 2B Northern Tropical Semi-evergreen Forests</i>	Type 11CS2 Southern Montane Wet Grasslands
Group 3 Tropical Moist Deciduous Forests	NON CHAMPION & SETH CLASSES
<i>Subgroup 3B South Indian Moist Deciduous Forests</i>	Extensive Bamboo Areas
Type 3B/c1 Moist teak bearing forest	Grasslands on Hill Plateaus
Type 3B/c2 Southern moist mixed deciduous forests	Rivers
<i>Subgroup 3C North Indian Moist Deciduous Forests</i>	Reservoir
Type 3C/c2b-2d Moist Bhabar and Plains Sal Forest	Swamps (tals)
Type 3C/c2d1 Chander Sal	Teak Plantations
Type 3C/c2DS1 Moist Sal savannah	Sal Plantations
Type 3C/IS1 Low Alluvial Savanah woodlands	Tea/ Coffee and cardamum
Type 3C/c3 West Gangetic Moist Mixed Deciduous Forests	Wattle and Pinus
Group 4 Littoral and Swamp Forests	Young jhum (< 10 years)
<i>Subgroup 4D Tropical Seasonal Swamp Forests</i>	Middle jhum (10-20 years)
<i>Subgroup 4E Tropical Riparian Fringing Forests</i>	Old jhum (> 20 years)
Group 5 Tropical Dry Deciduous Forests	Riparian Forests
<i>Subgroup 5A Southern Tropical Dry Deciduous Forests</i>	Mesic Groves
Type 5A/c1 Dry Teak bearing Forest	
Type 5A/c3 Southern Dry Mixed Deciduous Forests	

Eucalyptus Plantations

Trophic category

Habitat elements/substrates

Habitat elements of biotic origin (special habitats)

Snags

Snag recruits (dying trees, live trees with dead portions)

Hollow trees, chimney trees (living or dead)

Tree cavities (natural or created)

Large old trees (living)

Trees with fluting boles and buttresses

Down wood

Litter and duff layers on the ground

Litter in streams

Lianas

Fruit-bearing shrubs

Fruit-bearing trees

Epiphyte patches

Habitat elements of geomorphic origin

Cliffs, talus, and ledges

Caves

Overhangs

Dens (existing burrows dug by animals)

Sheet rocks

Large bouldery aggregates

Rock outcrops

Sandy banks and sand spits

Salt licks (exposed mineral soils)

Earth cuttings - exposed banks

Man-made (anthropogenic) structures

Additional / other (specify)

Structural stage

Early stage - managed

Mid stage - managed

Late stage - managed

Old-growth stage - unmanaged

Other - unmanaged

Key ecological functions

Sensitivity to anthropogenic disturbance

WHR MATRIX – Data Dictionary

Version: 31 August 2001

Scientific name (cite source)

Vernacular name

Taxonomic class

A – amphibian

R – reptile

B – bird

M – mammal

Legal status

As denoted in Wildlife Protection Act: SI, SII, SIII, SIV, SV

As denoted in CITES: AI, AII, AIII

Conservation status (IUCN categories)

CE – critically endangered

EN – endangered

VU – vulnerable

LR – lower risk

DD – data deficient, might be one of above
[blank] – none of above

Endemism status (endemism = species found nowhere else for at least a portion of the year)

ER - Endemic to region

EC - Endemic to CA

No - neither of the above

Residency status (pertinent to the region in which the CA occurs)

P - Permanent (year-round) resident

S – Seasonal resident (occurs only seasonally and not year-round)

M – Seasonal migrant or movement only

V – vagrant / incidental

Conservation area

A – ACA

G – GCA

S – SCA

T – TCA

Abundance / distribution status within the CA

A – abundant and well-distributed

B – uncommon but widely distributed

C – fairly abundant but more patchily

distributed with gaps
 D – disjunct population patches
 E – disjunct patches of small local populations at risk of local extirpation
 F – extremely patchy with high risk of overall extirpation
 Conflict with humans (more frequent than just incidental occurrences)
 K – Human killing
 H - Human injuries
 C - Crop depredation
 P - Destruction of property
 L - Livestock depredation

Ecosystem types

Each species is coded for each ecosystem type as follows:

2 = Closely associated (provides critical resources for survival and reproduction)
 1 = Associated (occurs but not critical)
 0 = Absent
 blank = does not occur in conservation area

Ecosystem types listed in the WHR matrix include (see attached specific listing):

Champion and Seth Forest Types of India (to the group level)

Other, non-CS types including plantations

Trophic category

He- Herbivore (plant-eating)
 Fr – Frugivore (fleshy fruit-eating)
 Gr – Granivore (seed-eating)
 Ca - Carnivore (consumes animals other than

insects)

Ov – Ovivore (egg-eating)
 In – Insectivore (insect-eating)
 Pi – Piscivore (fish-eating)
 Cn – Carrion (dead animal-eating)

Habitat elements/substrates, B,F,Oth

Habitat elements of biotic origin
 A. Snags
 B. Snag recruits (dying trees, live trees with

dead portions)
 C. Hollow trees, chimney trees (living or dead)
 D. Tree cavities (natural or created)
 E. Large old trees (living)
 F. Trees with fluting boles and buttresses
 G. Down wood
 H. Litter and duff layers on the ground
 I. Litter in streams
 J. Lianas
 K. Fruit-bearing shrubs
 L. Fruit-bearing trees
 M. Epiphyte patches

Habitat elements of geomorphic or anthropogenic origin

N. Cliffs, talus, and ledges
 O. Caves
 P. Overhangs
 Q. Dens (existing burrows dug by animals)
 R. Sheet rocks
 S. Large bouldery aggregates
 T. Rock outcrops
 U. Sandy banks and sand spits
 V. Salt licks (exposed mineral soils)
 W. Earth cuttings – exposed banks
 X. Man-made (anthropogenic) structures (e.g., culverts, causeways, buildings, bridges)
 Y. Additional / other (specify)

Structural stage

Early stage - managed
 Mid stage - managed
 Late stage - managed
 Old-growth stage – unmanaged
 Other - unmanaged

Key ecological functions

A. Pollination vector
 B. Disperser of plant propagules, fruits, seeds, etc.
 C. Primary tree cavity excavator

-
- D. Primary ground burrow excavator
 - E. Creator of paths or runways (terrestrial or arboreal)
 - F. Soil digging
 - G. Soil compaction, trampling
 - H. Primary (staple) prey for carnivores
 - I. Other (specify)
- Sensitivity to anthropogenic disturbance
- A. Cannabis growing
 - B. Clearing of undergrowth
 - C. Construction activities in general
 - D. Cutting of climbers
 - E. Draining of wetlands
 - F. Extraction of flowers NTFPs
 - G. Extraction of fruit NTFPs
 - H. Extraction of honey NTFPs
 - I. Fire (human-set ground fires)
 - J. Fishing
 - K. Fuelwood gathering
 - L. Harrowing of wild grasslands
 - M. Illicit timber and bamboo harvest / extraction
 - N. Impoundments
 - O. Introducing exotic vegetation
 - P. Jhum
 - Q. Legal hunting
 - R. Livestock grazing
 - S. Lopping
 - T. Loss of snags, hollow trees
 - U. Marking, thinning of immature trees, and legal felling of mature trees or bamboo harvesting
 - V. Pesticides and chemicals
 - W. Plantations in grassy blanks
 - X. Poaching (illegal hunting or capture)
 - Y. Railroads
 - Z. Religious visits / pilgrimages
 - AA. Removing of riparian vegetation
 - BB. Roads and vehicle traffic
 - CC. Rock climbing
 - DD. Sand mining
 - EE. Tourism and recreation
-

Vernacular name		Large Wrinkled Frog	
Scientific name		<i>Nyctribatrachus major</i>	
Taxonomic class	A	Trophic category	In
Legal Status - Wildlife Protection Act	SIV	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN	LR	Snags	
Endemism status	ER	Snag recruits (dying trees, live trees with dead portions)	
Residency status	P	Hollow trees, chimney trees (living or dead)	
Conservation area	A	Tree cavities (natural or created)	
Abundance / distribution status	D	Large old trees (living)	
Conflict with humans		Trees with fluting boles and buttresses	
Champion and Seth Forest Types of India (to the group level):		Down wood	
Southern catch thorn forests	0	Litter and duff layers	F
Southern tropical dry deciduous forests – dry teak forest	0	Litter in streams	
Southern tropical moist deciduous forest	2	Lianas	
Southern moist and wet bamboo brakes	0	Fruit-bearing shrubs	
Southern tropical wet evergreen forests	2	Fruit bearing trees	
Nilgiri sub-tropical evergreen forest	2	Epiphyte patches	
Southern wet temperate forests (sholas)	1	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	2	Cliffs, talus, and ledges	
Riparian fringing forests	2	Caves	
Southern tropical dry deciduous forests	0	Overhangs	
Wet grassland habitat on hill plateaus	1	Dens (existing burrows dug by animals)	
Rivers	2	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	
Teak plantations	0	Rock outcrops	
Coffee and cardamom	0	Sandy banks and sand spits	B,F
Tea	0	Salt licks (exposed mineral soils)	
Wattle	0	Earth cuttings	
Pinus	0	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	
		Mid stage	
		Late stage	
		Old-growth stage - unmanaged	
		Other – unmanaged	
Additional / other (specify)		boulders, pools, in streams	
Key ecological functions			
Sensitivity to anthropogenic disturbance	S,U		

Vernacular name		Anaimalai salea	
Scientific name		<i>Salea anamallayana</i>	
Taxonomic class	A	Trophic category	In
Legal Status - Wildlife Protection Act	??	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN	EN	Snags	
Endemism status	ER	Snag recruits (dying trees, live trees with dead portions)	
Residency status	P	Hollow trees, chimney trees (living or dead)	
Conservation area	A	Tree cavities (natural or created)	
Abundance / distribution status	D	Large old trees (living)	
Conflict with humans		Trees with fluting boles and buttresses	
Champion and Seth Forest Types of India (to the group level):		Down wood	
Southern catch thorn forests	0	Litter and duff layers	
Southern tropical dry deciduous forests – dry teak forest	0	Litter in streams	
Southern tropical moist deciduous forest	0	Lianas	
Southern moist and wet bamboo brakes	0	Fruit-bearing shrubs	
Southern tropical wet evergreen forests	0	Fruit bearing trees	
Nilgiri sub-tropical evergreen forest	0	Epiphyte patches	
Southern wet temperate forests (sholas)	2	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	0	Cliffs, talus, and ledges	
Riparian fringing forests	0	Caves	
Southern tropical dry deciduous forests	0	Overhangs	
Wet grassland habitat on hill plateaus	0	Dens (existing burrows dug by animals)	
Rivers	0	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	
Teak plantations	0	Rock outcrops	
Coffee and cardamom	0	Sandy banks and sand spits	
Tea	0	Salt licks (exposed mineral soils)	
Wattle	0	Earth cuttings	
Pinus	0	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	
		Mid stage	
		Late stage	
		Old-growth stage - unmanaged	
		Other – unmanaged	
Additional / other (specify)			
Key ecological functions			
Sensitivity to anthropogenic disturbance		A,E,I,	

Vernacular name		Kerala Warty Frog	
Scientific name		<i>Limnonectes keralensis</i>	
Taxonomic class	A	Trophic category	In
Legal Status - Wildlife Protection Act	SIV	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN		Snags	
Endemism status	ER	Snag recruits (dying trees, live trees with dead portions)	
Residency status	P	Hollow trees, chimney trees (living or dead)	
Conservation area	A	Tree cavities (natural or created)	
Abundance / distribution status	A	Large old trees (living)	
Conflict with humans		Trees with fluting boles and buttresses	
Champion and Seth Forest Types of India (to the group level):		Down wood	
Southern catch thorn forests	1	Litter and duff layers	F
Southern tropical dry deciduous forests - dry teak forest	2	Litter in streams	B,F
Southern tropical moist deciduous forest	2	Lianas	
Southern moist and wet bamboo brakes	2	Fruit-bearing shrubs	
Southern tropical wet evergreen forests	2	Fruit bearing trees	
Nilgiri sub-tropical evergreen forest	2	Epiphyte patches	
Southern wet temperate forests (sholas)	2	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	2	Cliffs, talus, and ledges	
Riparian fringing forests	2	Caves	
Southern tropical dry deciduous forests	2	Overhangs	
Wet grassland habitat on hill plateaus	1	Dens (existing burrows dug by animals)	
Rivers	2	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	
Teak plantations	1	Rock outcrops	
Coffee and cardamom	2	Sandy banks and sand spits	B,F
Tea	1	Salt licks (exposed mineral soils)	
Wattle	1	Earth cuttings	
Pinus	1	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	X
		Mid stage	X
		Late stage	X
		Old-growth stage - unmanaged	X
		Other - unmanaged	X
Additional / other (specify)			
Key ecological functions		Indicator	
Sensitivity to anthropogenic disturbance		J,N,V,X	

Vernacular name		Malabar black narrow mouthed frog	
Scientific name		<i>Melanobatrachus indicus</i>	
Taxonomic class	A	Trophic category	In
Legal Status - Wildlife Protection Act	SIV	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN		Snags	
Endemism status	ER	Snag recruits (dying trees, live trees with dead portions)	
Residency status	P	Hollow trees, chimney trees (living or dead)	
Conservation area	A	Tree cavities (natural or created)	
Abundance / distribution status	E	Large old trees (living)	
Conflict with humans		Trees with fluting boles and buttresses	
Champion and Seth Forest Types of India (to the group level):		Down wood	F
Southern cutch thorn forests	0	Litter and duff layers	F
Southern tropical dry deciduous forests – dry teak forest	0	Litter in streams	B
Southern tropical moist deciduous forest	0	Lianas	
Southern moist and wet bamboo brakes	0	Fruit-bearing shrubs	
Southern tropical wet evergreen forests	1	Fruit bearing trees	
Nilgiri sub-tropical evergreen forest	1	Epiphyte patches	
Southern wet temperate forests (sholas)	1	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	1	Cliffs, talus, and ledges	
Riparian fringing forests	2	Caves	
Southern tropical dry deciduous forests	0	Overhangs	
Wet grassland habitat on hill plateaus	0	Dens (existing burrows dug by animals)	
Rivers	0	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	
Teak plantations	0	Rock outcrops	
Coffee and cardamom	0	Sandy banks and sand spits	B,F
Tea	0	Salt licks (exposed mineral soils)	
Wattle	0	Earth cuttings	
Pinus	0	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	X
		Mid stage	X
		Late stage	X
		Old-growth stage - unmanaged	X
		Other - unmanaged	X
Additional / other (specify)			
Key ecological functions			
Sensitivity to anthropogenic disturbance			

Vernacular name		Pigmy Wrinkled Frog	
Scientific name		<i>Nyctribatrachus beddomii</i>	
Taxonomic class	A	Trophic category	In
Legal Status - Wildlife Protection Act	SIV	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN		Snags	
Endemism status	ER	Snag recruits (dying trees, live trees with dead portions)	
Residency status	P	Hollow trees, chimney trees (living or dead)	
Conservation area	A	Tree cavities (natural or created)	
Abundance / distribution status	E	Large old trees (living)	
Conflict with humans		Trees with fluting boles and buttresses	
Champion and Seth Forest Types of India (to the group level):		Down wood	
Southern catch thorn forests	0	Litter and duff layers	B,F
Southern tropical dry deciduous forests – dry teak forest	0	Litter in streams	B,F
Southern tropical moist deciduous forest	2	Lianas	
Southern moist and wet bamboo brakes	1	Fruit-bearing shrubs	
Southern tropical wet evergreen forests	2	Fruit bearing trees	
Nilgiri sub-tropical evergreen forest	1	Epiphyte patches	
Southern wet temperate forests (sholas)	2	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	1	Cliffs, talus, and ledges	
Riparian fringing forests	2	Caves	
Southern tropical dry deciduous forests	0	Overhangs	
Wet grassland habitat on hill plateaus	0	Dens (existing burrows dug by animals)	
Rivers	0	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	
Teak plantations	0	Rock outcrops	
Coffee and cardamom	0	Sandy banks and sand spits	B,F
Tea	0	Salt licks (exposed mineral soils)	
Wattle	0	Earth cuttings	
Pinus	0	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	
		Mid stage	X
		Late stage	X
		Old-growth stage - unmanaged	X
		Other - unmanaged	
Additional / other (specify)		Boulders in streams	
Key ecological functions			
Sensitivity to anthropogenic disturbance			

Vernacular name		Burrowing Frog	
Scientific name		<i>Tomopterna parambikulamana</i>	
Taxonomic class	A	Trophic category	In
Legal Status - Wildlife Protection Act	SIV	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN		Snags	B,F
Endemism status	ER	Snag recruits (dying trees, live trees with dead portions)	
Residency status	P	Hollow trees, chimney trees (living or dead)	B,F
Conservation area	A	Tree cavities (natural or created)	
Abundance / distribution status	D	Large old trees (living)	
Conflict with humans		Trees with fluting boles and buttresses	
Champion and Seth Forest Types of India (to the group level):		Down wood	F
Southern cutch thorn forests	0	Litter and duff layers	B,F
Southern tropical dry deciduous forests – dry teak forest	1	Litter in streams	
Southern tropical moist deciduous forest	2	Lianas	
Southern moist and wet bamboo brakes	2	Fruit-bearing shrubs	
Southern tropical wet evergreen forests	2	Fruit bearing trees	
Nilgiri sub-tropical evergreen forest	2	Epiphyte patches	
Southern wet temperate forests (sholas)	2	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	2	Cliffs, talus, and ledges	
Riparian fringing forests	2	Caves	
Southern tropical dry deciduous forests	1	Overhangs	
Wet grassland habitat on hill plateaus	0	Dens (existing burrows dug by animals)	
Rivers	0	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	
Teak plantations	1	Rock outcrops	
Coffee and cardamom	0	Sandy banks and sand spits	
Tea	0	Salt licks (exposed mineral soils)	
Wattle	0	Earth cuttings	
Pinus	0	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	X
		Mid stage	X
		Late stage	X
		Old-growth stage - unmanaged	X
Additional / other (specify)		Termite mounts	
Key ecological functions			
Sensitivity to anthropogenic disturbance			

Vernacular name		Bonelis Eagle	
Scientific name		<i>Heiraaetus fasciatus</i>	
Taxonomic class	B	Trophic category	Ca
Legal Status - Wildlife Protection Act	SI	Habitat elements/substrates	
Legal Status - CITES	?	Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN	?	Snags	
Endemism status	No	Snag recruits (dying trees, live trees with dead portions)	
Residency status	P	Hollow trees, chimney trees (living or dead)	
Conservation area	A+	Tree cavities (natural or created)	
Abundance / distribution status	B	Large old trees (living)	F
Conflict with humans		Trees with fluting boles and buttresses	
Champion and Seth Forest Types of India (to the group level):		Down wood	
Southern catch thorn forests	1	Litter and duff layers	
Southern tropical dry deciduous forests – dry teak forest	2	Litter in streams	
Southern tropical moist deciduous forest	2	Lianas	
Southern moist and wet bamboo brakes	1	Fruit-bearing shrubs	
Southern tropical wet evergreen forests	2	Fruit bearing trees	
Nilgiri sub-tropical evergreen forest	2	Epiphyte patches	
Southern wet temperate forests (sholas)	2	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	2	Cliffs, talus, and ledges	
Riparian fringing forests	2	Caves	
Southern tropical dry deciduous forests	2	Overhangs	
Wet grassland habitat on hill plateaus	1	Dens (existing burrows dug by animals)	
Rivers	0	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	
Teak plantations	2	Rock outcrops	
Coffee and cardamom	2	Sandy banks and sand spits	
Tea	1	Salt licks (exposed mineral soils)	
Wattle	1	Earth cuttings	
Pinus	1	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	
		Mid stage	X
		Late stage	X
		Old-growth stage - unmanaged	X
		Other - unmanaged	
Additional / other (specify)			
Key ecological functions			
Sensitivity to anthropogenic disturbance		C,I,Q	

Vernacular name		Dollarbird	
Scientific name		<i>Eurystomus orientalis</i>	
Taxonomic class	B	Trophic category	In
Legal Status - Wildlife Protection Act	SIV	Habitat elements/substrates	
Legal Status - CITES	?	Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN	?	Snags	B,F
Endemism status	No	Snag recruits (dying trees, live trees with dead portions)	B,F
Residency status	C	Hollow trees, chimney trees (living or dead)	
Conservation area	A,G	Tree cavities (natural or created)	B
Abundance / distribution status	C	Large old trees (living)	
Conflict with humans		Trees with fluting boles and buttresses	
Champion and Seth Forest Types of India (to the group level):		Down wood	
Southern catch thorn forests	0	Litter and duff layers	
Southern tropical dry deciduous forests – dry teak forest	0	Litter in streams	
Southern tropical moist deciduous forest	2	Lianas	
Southern moist and wet bamboo brakes	0	Fruit-bearing shrubs	
Southern tropical wet evergreen forests	2	Fruit bearing trees	
Nilgiri sub-tropical evergreen forest	2	Epiphyte patches	
Southern wet temperate forests (sholas)	0	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	0	Cliffs, talus, and ledges	
Riparian fringing forests	2	Caves	
Southern tropical dry deciduous forests	0	Overhangs	
Wet grassland habitat on hill plateaus	0	Dens (existing burrows dug by animals)	
Rivers	1	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	
Teak plantations	1	Rock outcrops	
Coffee and cardamom	1	Sandy banks and sand spits	
Tea	0	Salt licks (exposed mineral soils)	
Wattle	0	Earth cuttings	
Pinus	0	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	
		Mid stage	
		Late stage	X
		Old-growth stage - unmanaged	X
		Other - unmanaged	
Additional / other (specify)			
Key ecological functions			
Sensitivity to anthropogenic disturbance		C,D,H,	

Vernacular name		Perigrine Falcon	
Scientific name		<i>Falco peregrinus japonensis</i>	
Taxonomic class	B	Trophic category	Ca
Legal Status - Wildlife Protection Act	SI	Habitat elements/substrates	
Legal Status - CITES	AI?	Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN	EN	Snags	F
Endemism status	No	Snag recruits (dying trees, live trees with dead portions)	F
Residency status	C	Hollow trees, chimney trees (living or dead)	
Conservation area	A+	Tree cavities (natural or created)	
Abundance / distribution status	A*	Large old trees (living)	
Conflict with humans		Trees with fluting boles and buttresses	
Champion and Seth Forest Types of India (to the group level):		Down wood	
Southern catch thorn forests	1	Litter and duff layers	
Southern tropical dry deciduous forests – dry teak forest	1	Litter in streams	
Southern tropical moist deciduous forest	1	Lianas	
Southern moist and wet bamboo brakes	1	Fruit-bearing shrubs	
Southern tropical wet evergreen forests	1	Fruit bearing trees	
Nilgiri sub-tropical evergreen forest	1	Epiphyte patches	
Southern wet temperate forests (sholas)	2	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	1	Cliffs, talus, and ledges	B,F
Riparian fringing forests	2	Caves	
Southern tropical dry deciduous forests	1	Overhangs	
Wet grassland habitat on hill plateaus	2	Dens (existing burrows dug by animals)	
Rivers	2	Sheet rocks	
Reservoirs	2	Large bouldery aggregates	
Teak plantations	1	Rock outcrops	
Coffee and cardamom	1	Sandy banks and sand spits	
Tea	1	Salt licks (exposed mineral soils)	
Wattle	1	Earth cuttings	
Pinus	1	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	
		Mid stage	
		Late stage	
		Old-growth stage - unmanaged	
		Other - unmanaged	
Additional / other (specify)			
Key ecological functions			
Sensitivity to anthropogenic disturbance		M,V,X	

Vernacular name		Nilgiri Pipit	
Scientific name		<i>Anthus nilghirensis</i>	
Taxonomic class	B	Trophic category	In
Legal Status - Wildlife Protection Act	SIV	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN		Snags	
Endemism status	ER	Snag recruits (dying trees, live trees with dead portions)	
Residency status	P	Hollow trees, chimney trees (living or dead)	
Conservation area	A	Tree cavities (natural or created)	
Abundance / distribution status	C	Large old trees (living)	
Conflict with humans		Trees with fluting boles and buttresses	
Champion and Seth Forest Types of India (to the group level):		Down wood	
Southern catch thorn forests	0	Litter and duff layers	F
Southern tropical dry deciduous forests – dry teak forest	0	Litter in streams	
Southern tropical moist deciduous forest	0	Lianas	
Southern moist and wet bamboo brakes	0	Fruit-bearing shrubs	
Southern tropical wet evergreen forests	0	Fruit bearing trees	
Nilgiri sub-tropical evergreen forest	1	Epiphyte patches	
Southern wet temperate forests (sholas)	1	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	0	Cliffs, talus, and ledges	B
Riparian fringing forests	0	Caves	
Southern tropical dry deciduous forests	0	Overhangs	
Wet grassland habitat on hill plateaus	2	Dens (existing burrows dug by animals)	
Rivers	0	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	
Teak plantations	0	Rock outcrops	
Coffee and cardamom	1	Sandy banks and sand spits	B
Tea	1	Salt licks (exposed mineral soils)	
Wattle	1	Earth cuttings	B
Pinus	1	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	X
		Mid stage	
		Late stage	
		Old-growth stage - unmanaged	
		Other - unmanaged	
Additional / other (specify)			
Key ecological functions			
Sensitivity to anthropogenic disturbance		A,I,L,W	

Vernacular name		Little Spiderhunter	
Scientific name		<i>Arachnothera longirostra</i>	
Taxonomic class	B	Trophic category	In
Legal Status - Wildlife Protection Act	SIV	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN		Snags	
Endemism status	No	Snag recruits (dying trees, live trees with dead portions)	
Residency status	P	Hollow trees, chimney trees (living or dead)	
Conservation area	A+	Tree cavities (natural or created)	
Abundance / distribution status	B	Large old trees (living)	B,F
Conflict with humans		Trees with fluting boles and buttresses	F
Champion and Seth Forest Types of India (to the group level):		Down wood	
Southern catch thorn forests	0	Litter and duff layers	
Southern tropical dry deciduous forests – dry teak forest	0	Litter in streams	
Southern tropical moist deciduous forest	2	Lianas	B,F
Southern moist and wet bamboo brakes	2	Fruit-bearing shrubs	
Southern tropical wet evergreen forests	2	Fruit bearing trees	
Nilgiri sub-tropical evergreen forest	1	Epiphyte patches	B,F
Southern wet temperate forests (sholas)	1	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	1	Cliffs, talus, and ledges	
Riparian fringing forests	1	Caves	
Southern tropical dry deciduous forests	1	Overhangs	
Wet grassland habitat on hill plateaus	0	Dens (existing burrows dug by animals)	
Rivers	0	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	
Teak plantations	0	Rock outcrops	
Coffee and cardamom	1	Sandy banks and sand spits	
Tea	0	Salt licks (exposed mineral soils)	
Wattle	0	Earth cuttings	
Pinus	0	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	
		Mid stage	
		Late stage	X
		Old-growth stage - unmanaged	X
		Other - unmanaged	X
Additional / other (specify)			
Key ecological functions		A	
Sensitivity to anthropogenic disturbance		B,D,I,M,S,U	

Vernacular name		Sri Lanka Frogmouth	
Scientific name		<i>Batrachostomus monilinger</i>	
Taxonomic class	B	Trophic category	In
Legal Status - Wildlife Protection Act	SI	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN		Snags	
Endemism status	No	Snag recruits (dying trees, live trees with dead portions)	
Residency status	P	Hollow trees, chimney trees (living or dead)	
Conservation area	A	Tree cavities (natural or created)	
Abundance / distribution status	C	Large old trees (living)	
Conflict with humans		Trees with fluting boles and buttresses	
Champion and Seth Forest Types of India (to the group level):		Down wood	
Southern catch thorn forests	0	Litter and duff layers	
Southern tropical dry deciduous forests – dry teak forest	0	Litter in streams	
Southern tropical moist deciduous forest	1	Lianas	B
Southern moist and wet bamboo brakes	1	Fruit-bearing shrubs	
Southern tropical wet evergreen forests	2	Fruit bearing trees	
Nilgiri sub-tropical evergreen forest	2	Epiphyte patches	B
Southern wet temperate forests (sholas)	2	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	1	Cliffs, talus, and ledges	
Riparian fringing forests	2	Caves	
Southern tropical dry deciduous forests	1	Overhangs	
Wet grassland habitat on hill plateaus	0	Dens (existing burrows dug by animals)	
Rivers	0	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	
Teak plantations	0	Rock outcrops	
Coffee and cardamom	0	Sandy banks and sand spits	
Tea	0	Salt licks (exposed mineral soils)	
Wattle	0	Earth cuttings	
Pinus	0	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	
		Mid stage	
		Late stage	X
		Old-growth stage - unmanaged	X
		Other - unmanaged	
Additional / other (specify)		THICK UNDER GROWTH	
Key ecological functions			
Sensitivity to anthropogenic disturbance		B,D,M,I,U	

Vernacular name		White-bellied Shortwing	
Scientific name		<i>Brachypteryx major</i>	
Taxonomic class	B	Trophic category	In
Legal Status - Wildlife Protection Act	SIV	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN		Snags	
Endemism status	ER	Snag recruits (dying trees, live trees with dead portions)	F
Residency status	P	Hollow trees, chimney trees (living or dead)	F
Conservation area	A	Tree cavities (natural or created)	F
Abundance / distribution status	C	Large old trees (living)	F
Conflict with humans		Trees with fluting boles and buttresses	F
Champion and Seth Forest Types of India (to the group level):		Down wood	F
Southern catch thorn forests	0	Litter and duff layers	F
Southern tropical dry deciduous forests – dry teak forest	0	Litter in streams	F
Southern tropical moist deciduous forest	0	Lianas	B,F
Southern moist and wet bamboo brakes	1	Fruit-bearing shrubs	
Southern tropical wet evergreen forests	1	Fruit bearing trees	
Nilgiri sub-tropical evergreen forest	1	Epiphyte patches	B,F
Southern wet temperate forests (sholas)	2	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	0	Cliffs, talus, and ledges	
Riparian fringing forests	1	Caves	
Southern tropical dry deciduous forests	0	Overhangs	
Wet grassland habitat on hill plateaus	0	Dens (existing burrows dug by animals)	
Rivers	0	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	
Teak plantations	0	Rock outcrops	
Coffee and cardamom	0	Sandy banks and sand spits	
Tea	0	Salt licks (exposed mineral soils)	
Wattle	1	Earth cuttings	
Pinus	1	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	
		Mid stage	X
		Late stage	X
		Old-growth stage - unmanaged	X
		Other - unmanaged	X
Additional / other (specify)			
Key ecological functions			
Sensitivity to anthropogenic disturbance		B,D,I,S,U	

Vernacular name		Little Ringed Plover	
Scientific name		<i>Charadrius dubius</i>	
Taxonomic class	B	Trophic category	
Legal Status - Wildlife Protection Act	SIV	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN		Snags	
Endemism status	No	Snag recruits (dying trees, live trees with dead portions)	
Residency status	M	Hollow trees, chimney trees (living or dead)	
Conservation area	A	Tree cavities (natural or created)	
Abundance / distribution status	A	Large old trees (living)	
Conflict with humans		Trees with fluting boles and buttresses	
Champion and Seth Forest Types of India (to the group level):		Down wood	
Southern catch thorn forests	0	Litter and duff layers	
Southern tropical dry deciduous forests - dry teak forest	0	Litter in streams	
Southern tropical moist deciduous forest	0	Lianas	
Southern moist and wet bamboo brakes	0	Fruit-bearing shrubs	
Southern tropical wet evergreen forests	0	Fruit bearing trees	
Nilgiri sub-tropical evergreen forest	0	Epiphyte patches	
Southern wet temperate forests (sholas)	0	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	0	Cliffs, talus, and ledges	
Riparian fringing forests	0	Caves	
Southern tropical dry deciduous forests	0	Overhangs	
Wet grassland habitat on hill plateaus	0	Dens (existing burrows dug by animals)	
Rivers	???	Sheet rocks	
Reservoirs	???	Large bouldery aggregates	
Teak plantations	0	Rock outcrops	
Coffee and cardamom	0	Sandy banks and sand spits	X
Tea	0	Salt licks (exposed mineral soils)	
Wattle	0	Earth cuttings	
Pinus	0	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	X
		Mid stage	
		Late stage	
		Old-growth stage - unmanaged	
		Other - unmanaged	
Additional / other (specify)			
Key ecological functions			
Sensitivity to anthropogenic disturbance		R	

Vernacular name		Indian Swiftlet	
Scientific name		<i>Collocalia unicolor</i>	
Taxonomic class	B	Trophic category	In
Legal Status - Wildlife Protection Act		Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN		Snags	
Endemism status	No	Snag recruits (dying trees, live trees with dead portions)	
Residency status	P	Hollow trees, chimney trees (living or dead)	
Conservation area	A	Tree cavities (natural or created)	
Abundance / distribution status	C	Large old trees (living)	
Conflict with humans		Trees with fluting boles and buttresses	
Champion and Seth Forest Types of India (to the group level):		Down wood	
Southern catch thorn forests	1	Litter and duff layers	
Southern tropical dry deciduous forests – dry teak forest	1	Litter in streams	
Southern tropical moist deciduous forest	1	Lianas	
Southern moist and wet bamboo brakes	1	Fruit-bearing shrubs	
Southern tropical wet evergreen forests	1	Fruit bearing trees	
Nilgiri sub-tropical evergreen forest	1	Epiphyte patches	
Southern wet temperate forests (sholas)	1	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	1	Cliffs, talus, and ledges	B
Riparian fringing forests	1	Caves	B
Southern tropical dry deciduous forests	1	Overhangs	B
Wet grassland habitat on hill plateaus	1	Dens (existing burrows dug by animals)	
Rivers	0	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	
Teak plantations	1	Rock outcrops	F
Coffee and cardamom	1	Sandy banks and sand spits	
Tea	1	Salt licks (exposed mineral soils)	
Wattle	1	Earth cuttings	
Pinus	1	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	
		Mid stage	
		Late stage	
		Old-growth stage - unmanaged	
		Other - unmanaged	
Additional / other (specify)			
Key ecological functions			
Sensitivity to anthropogenic disturbance		H	

Vernacular name		Nilgiri Wood Pigeon	
Scientific name		<i>Columba elphinstonii</i>	
Taxonomic class	B	Trophic category	Fr
Legal Status - Wildlife Protection Act	SIV	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN		Snags	
Endemism status	ER	Snag recruits (dying trees, live trees with dead portions)	
Residency status	P	Hollow trees, chimney trees (living or dead)	
Conservation area	A	Tree cavities (natural or created)	
Abundance / distribution status	C	Large old trees (living)	B,F
Conflict with humans		Trees with fluting boles and buttresses	
Champion and Seth Forest Types of India (to the group level):		Down wood	
Southern catch thorn forests	0	Litter and duff layers	
Southern tropical dry deciduous forests – dry teak forest	0	Litter in streams	
Southern tropical moist deciduous forest	1	Lianas	B,F
Southern moist and wet bamboo brakes	0	Fruit-bearing shrubs	F
Southern tropical wet evergreen forests	1	Fruit bearing trees	F
Nilgiri sub-tropical evergreen forest	2	Epiphyte patches	F
Southern wet temperate forests (sholas)	2	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	1	Cliffs, talus, and ledges	
Riparian fringing forests	1	Caves	
Southern tropical dry deciduous forests	0	Overhangs	
Wet grassland habitat on hill plateaus	1	Dens (existing burrows dug by animals)	
Rivers	0	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	
Teak plantations	0	Rock outcrops	
Coffee and cardamom	1	Sandy banks and sand spits	
Tea	0	Salt licks (exposed mineral soils)	
Wattle	1	Earth cuttings	
Pinus	1	Man-made (anthropogenic) structures	B
		Structural stage	
		Early stage	
		Mid stage	
		Late stage	X
		Old-growth stage - unmanaged	X
		Other - unmanaged	
Additional / other (specify)			
Key ecological functions		B	
Sensitivity to anthropogenic disturbance		D,G,I,K,S,U,X	

Vernacular name		White-bellied Tree-pie	
Scientific name		<i>Dendrocitta leucogastra</i>	
Taxonomic class	B	Trophic category	In
Legal Status - Wildlife Protection Act	SIV	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN		Snags	
Endemism status	ER	Snag recruits (dying trees, live trees with dead portions)	
Residency status	P	Hollow trees, chimney trees (living or dead)	F
Conservation area	A	Tree cavities (natural or created)	
Abundance / distribution status	A	Large old trees (living)	B,F
Conflict with humans		Trees with fluting boles and buttresses	F
Champion and Seth Forest Types of India (to the group level):		Down wood	F
Southern catch thorn forests	0	Litter and duff layers	F
Southern tropical dry deciduous forests – dry teak forest	1	Litter in streams	
Southern tropical moist deciduous forest	2	Lianas	F
Southern moist and wet bamboo brakes	1	Fruit-bearing shrubs	F
Southern tropical wet evergreen forests	2	Fruit bearing trees	F
Nilgiri sub-tropical evergreen forest	2	Epiphyte patches	F
Southern wet temperate forests (sholas)	2	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	2	Cliffs, talus, and ledges	
Riparian fringing forests	2	Caves	
Southern tropical dry deciduous forests	1	Overhangs	
Wet grassland habitat on hill plateaus	0	Dens (existing burrows dug by animals)	
Rivers	0	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	
Teak plantations	1	Rock outcrops	
Coffee and cardamom	1	Sandy banks and sand spits	
Tea	1	Salt licks (exposed mineral soils)	
Wattle	1	Earth cuttings	
Pinus	1	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	X
		Mid stage	X
		Late stage	X
		Old-growth stage - unmanaged	X
		Other - unmanaged	X
Additional / other (specify)			
Key ecological functions			
Sensitivity to anthropogenic disturbance		B,C,D,F,G,I,M,S,U	

Vernacular name		White-bellied Woodpecker	
Scientific name		<i>Dryocopus javensis</i>	
Taxonomic class	B	Trophic category	In
Legal Status - Wildlife Protection Act	SIV	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN		Snags	B,F
Endemism status	No	Snag recruits (dying trees, live trees with dead portions)	B,F
Residency status	P	Hollow trees, chimney trees (living or dead)	B,F
Conservation area	A,S	Tree cavities (natural or created)	B,F
Abundance / distribution status	D	Large old trees (living)	B,F
Conflict with humans		Trees with fluting boles and buttresses	F
Champion and Seth Forest Types of India (to the group level):		Down wood	F
Southern catch thorn forests	0	Litter and duff layers	
Southern tropical dry deciduous forests - dry teak forest	0	Litter in streams	
Southern tropical moist deciduous forest	1	Lianas	
Southern moist and wet bamboo brakes	0	Fruit-bearing shrubs	
Southern tropical wet evergreen forests	2	Fruit bearing trees	
Nilgiri sub-tropical evergreen forest	1	Epiphyte patches	F
Southern wet temperate forests (sholas)	1	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	2	Cliffs, talus, and ledges	
Riparian fringing forests	2	Caves	
Southern tropical dry deciduous forests	0	Overhangs	
Wet grassland habitat on hill plateaus	0	Dens (existing burrows dug by animals)	
Rivers	0	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	
Teak plantations	1	Rock outcrops	
Coffee and cardamom	1	Sandy banks and sand spits	
Tea	0	Salt licks (exposed mineral soils)	
Wattle	0	Earth cuttings	
Pinus	0	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	
		Mid stage	
		Late stage	X
		Old-growth stage - unmanaged	X
		Other - unmanaged	
Additional / other (specify)		boulders, pools, in streams	
Key ecological functions		C	
Sensitivity to anthropogenic disturbance		K,S	

Vernacular name		Green Imperial Pigeon	
Scientific name		<i>Ducula aenea</i>	
Taxonomic class	B	Trophic category	Fr
Legal Status - Wildlife Protection Act	SIV	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN		Snags	
Endemism status	No	Snag recruits (dying trees, live trees with dead portions)	
Residency status	P	Hollow trees, chimney trees (living or dead)	
Conservation area	A,G	Tree cavities (natural or created)	
Abundance / distribution status	B	Large old trees (living)	B,F
Conflict with humans		Trees with fluting boles and buttresses	
Champion and Seth Forest Types of India (to the group level):		Down wood	
Southern catch thorn forests	0	Litter and duff layers	
Southern tropical dry deciduous forests - dry teak forest	0	Litter in streams	
Southern tropical moist deciduous forest	2	Lianas	F
Southern moist and wet bamboo brakes	1	Fruit-bearing shrubs	F
Southern tropical wet evergreen forests	2	Fruit bearing trees	F
Nilgiri sub-tropical evergreen forest	2	Epiphyte patches	
Southern wet temperate forests (sholas)	2	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	2	Cliffs, talus, and ledges	
Riparian fringing forests	2	Caves	
Southern tropical dry deciduous forests	1	Overhangs	
Wet grassland habitat on hill plateaus		Dens (existing burrows dug by animals)	
Rivers		Sheet rocks	
Reservoirs		Large bouldery aggregates	
Teak plantations	1	Rock outcrops	
Coffee and cardamom	1	Sandy banks and sand spits	
Tea		Salt licks (exposed mineral soils)	
Wattle		Earth cuttings	
Pinus		Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	
		Mid stage	
		Late stage	X
		Old-growth stage - unmanaged	X
		Other - unmanaged	
Additional / other (specify)			
Key ecological functions		B	
Sensitivity to anthropogenic disturbance		G,S,X	

Vernacular name		Nilgiri Flycatcher	
Scientific name		<i>Eumyias albicaudata</i>	
Taxonomic class	B	Trophic category	In
Legal Status - Wildlife Protection Act	SIV	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN		Snags	
Endemism status	ER	Snag recruits (dying trees, live trees with dead portions)	
Residency status	P	Hollow trees, chimney trees (living or dead)	
Conservation area	A	Tree cavities (natural or created)	
Abundance / distribution status	C	Large old trees (living)	F
Conflict with humans		Trees with fluting boles and buttresses	F
Champion and Seth Forest Types of India (to the group level):		Down wood	
Southern catch thorn forests	0	Litter and duff layers	
Southern tropical dry deciduous forests – dry teak forest	0	Litter in streams	
Southern tropical moist deciduous forest	2	Lianas	F
Southern moist and wet bamboo brakes	2	Fruit-bearing shrubs	F
Southern tropical wet evergreen forests	2	Fruit bearing trees	F
Nilgiri sub-tropical evergreen forest	2	Epiphyte patches	F
Southern wet temperate forests (sholas)	2	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	2	Cliffs, talus, and ledges	
Riparian fringing forests	2	Caves	
Southern tropical dry deciduous forests	1	Overhangs	
Wet grassland habitat on hill plateaus	0	Dens (existing burrows dug by animals)	
Rivers	0	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	
Teak plantations	0	Rock outcrops	
Coffee and cardamom	2	Sandy banks and sand spits	
Tea	1	Salt licks (exposed mineral soils)	
Wattle	2	Earth cuttings	
Pinus	2	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	
		Mid stage	X
		Late stage	X
		Old-growth stage - unmanaged	X
		Other - unmanaged	
Additional / other (specify)			
Key ecological functions			
Sensitivity to anthropogenic disturbance		B,D,I,M,U	

Vernacular name		Great Eared Nightjar	
Scientific name		<i>Eurostopodus macrotis</i>	
Taxonomic class	B	Trophic category	In
Legal Status - Wildlife Protection Act	SIV	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN		Snags	
Endemism status	No	Snag recruits (dying trees, live trees with dead portions)	
Residency status	P	Hollow trees, chimney trees (living or dead)	
Conservation area	A	Tree cavities (natural or created)	
Abundance / distribution status	D	Large old trees (living)	
Conflict with humans		Trees with fluting boles and buttresses	
Champion and Seth Forest Types of India (to the group level):		Down wood	
Southern catch thorn forests	0	Litter and duff layers	B,F
Southern tropical dry deciduous forests – dry teak forest	0	Litter in streams	
Southern tropical moist deciduous forest	1	Lianas	
Southern moist and wet bamboo brakes	1	Fruit-bearing shrubs	
Southern tropical wet evergreen forests	2	Fruit bearing trees	
Nilgiri sub-tropical evergreen forest	2	Epiphyte patches	
Southern wet temperate forests (sholas)	2	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	1	Cliffs, talus, and ledges	
Riparian fringing forests	1	Caves	
Southern tropical dry deciduous forests	0	Overhangs	
Wet grassland habitat on hill plateaus	0	Dens (existing burrows dug by animals)	
Rivers	0	Sheet rocks	F
Reservoirs	0	Large bouldery aggregates	F
Teak plantations	0	Rock outcrops	F
Coffee and cardamom	0	Sandy banks and sand spits	F
Tea	0	Salt licks (exposed mineral soils)	
Wattle	0	Earth cuttings	F
Pinus	0	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	
		Mid stage	
		Late stage	X
		Old-growth stage - unmanaged	X
		Other - unmanaged	
Additional / other (specify)			
Key ecological functions			
Sensitivity to anthropogenic disturbance		I,R,W	

Vernacular name		Grey Junglefowl	
Scientific name		<i>Gallus sonneratii</i>	
Taxonomic class	B	Trophic category	Ca
Legal Status - Wildlife Protection Act	SIV	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN		Snags	
Endemism status	No	Snag recruits (dying trees, live trees with dead portions)	
Residency status	P	Hollow trees, chimney trees (living or dead)	
Conservation area	A	Tree cavities (natural or created)	
Abundance / distribution status	A	Large old trees (living)	
Conflict with humans		Trees with fluting boles and buttresses	B,F
Champion and Seth Forest Types of India (to the group level):		Down wood	F
Southern catch thorn forests	2	Litter and duff layers	B,F
Southern tropical dry deciduous forests – dry teak forest	2	Litter in streams	
Southern tropical moist deciduous forest	2	Lianas	
Southern moist and wet bamboo brakes	2	Fruit-bearing shrubs	F
Southern tropical wet evergreen forests	2	Fruit bearing trees	
Nilgiri sub-tropical evergreen forest	2	Epiphyte patches	
Southern wet temperate forests (sholas)	2	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	2	Cliffs, talus, and ledges	
Riparian fringing forests	2	Caves	
Southern tropical dry deciduous forests	2	Overhangs	
Wet grassland habitat on hill plateaus	2	Dens (existing burrows dug by animals)	
Rivers	0	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	
Teak plantations	2	Rock outcrops	
Coffee and cardamom	2	Sandy banks and sand spits	
Tea	2	Salt licks (exposed mineral soils)	
Wattle	2	Earth cuttings	
Pinus	2	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	X
		Mid stage	X
		Late stage	X
		Old-growth stage - unmanaged	X
		Other - unmanaged	X
Additional / other (specify)			
Key ecological functions		B	
Sensitivity to anthropogenic disturbance		B,G,I,K,M,R,U,X	

Vernacular name		Nilgiri Laughing Thrush	
Scientific name		<i>Garrulax cachinnans</i>	
Taxonomic class	B	Trophic category	Mixed
Legal Status - Wildlife Protection Act	SIV	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN		Snags	
Endemism status	ER	Snag recruits (dying trees, live trees with dead portions)	
Residency status	P	Hollow trees, chimney trees (living or dead)	
Conservation area	A	Tree cavities (natural or created)	
Abundance / distribution status	D	Large old trees (living)	
Conflict with humans		Trees with fluting boles and buttresses	
Champion and Seth Forest Types of India (to the group level):		Down wood	
Southern catch thorn forests	0	Litter and duff layers	F
Southern tropical dry deciduous forests – dry teak forest	0	Litter in streams	
Southern tropical moist deciduous forest	0	Lianas	F
Southern moist and wet bamboo brakes	0	Fruit-bearing shrubs	F
Southern tropical wet evergreen forests	1	Fruit bearing trees	F
Nilgiri sub-tropical evergreen forest	1	Epiphyte patches	B,F
Southern wet temperate forests (sholas)	2	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	1	Cliffs, talus, and ledges	
Riparian fringing forests	2	Caves	
Southern tropical dry deciduous forests	1	Overhangs	
Wet grassland habitat on hill plateaus	0	Dens (existing burrows dug by animals)	
Rivers	0	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	
Teak plantations	0	Rock outcrops	
Coffee and cardamom	0	Sandy banks and sand spits	
Tea	0	Salt licks (exposed mineral soils)	
Wattle	0	Earth cuttings	
Pinus	0	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	X
		Mid stage	X
		Late stage	X
		Old-growth stage - unmanaged	X
		Other - unmanaged	X
Additional / other (specify)			
Key ecological functions			
Sensitivity to anthropogenic disturbance		A,B,I,K,S,U	

Vernacular name		Heart-spotted Woodpecker	
Scientific name		<i>Hemicircus canente</i>	
Taxonomic class	B	Trophic category	In
Legal Status - Wildlife Protection Act	SIV	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN		Snags	
Endemism status	No	Snag recruits (dying trees, live trees with dead portions)	
Residency status	P	Hollow trees, chimney trees (living or dead)	
Conservation area	A+	Tree cavities (natural or created)	
Abundance / distribution status	C	Large old trees (living)	
Conflict with humans		Trees with fluting boles and buttresses	
Champion and Seth Forest Types of India (to the group level):		Down wood	
Southern catch thorn forests	1	Litter and duff layers	
Southern tropical dry deciduous forests – dry teak forest	2	Litter in streams	
Southern tropical moist deciduous forest	2	Lianas	
Southern moist and wet bamboo brakes	2	Fruit-bearing shrubs	
Southern tropical wet evergreen forests	1	Fruit bearing trees	
Nilgiri sub-tropical evergreen forest	1	Epiphyte patches	
Southern wet temperate forests (sholas)	1	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	2	Cliffs, talus, and ledges	
Riparian fringing forests	1	Caves	
Southern tropical dry deciduous forests	2	Overhangs	
Wet grassland habitat on hill plateaus	0	Dens (existing burrows dug by animals)	
Rivers	0	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	
Teak plantations	1	Rock outcrops	
Coffee and cardamom	2	Sandy banks and sand spits	
Tea	0	Salt licks (exposed mineral soils)	
Wattle	0	Earth cuttings	
Pinus	0	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	
		Mid stage	
		Late stage	
		Old-growth stage - unmanaged	
		Other - unmanaged	
Additional / other (specify)			
Key ecological functions			
Sensitivity to anthropogenic disturbance			

Vernacular name		Peafowl	
Scientific name		<i>Pavo cristatus</i>	
Taxonomic class	B	Trophic category	Ca
Legal Status - Wildlife Protection Act	SI	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN		Snags	F
Endemism status	No	Snag recruits (dying trees, live trees with dead portions)	F
Residency status	P	Hollow trees, chimney trees (living or dead)	
Conservation area	A+	Tree cavities (natural or created)	
Abundance / distribution status	A	Large old trees (living)	
Conflict with humans		Trees with fluting boles and buttresses	
Champion and Seth Forest Types of India (to the group level):		Down wood	F
Southern catch thorn forests	2	Litter and duff layers	B,F
Southern tropical dry deciduous forests - dry teak forest	2	Litter in streams	
Southern tropical moist deciduous forest	1	Lianas	
Southern moist and wet bamboo brakes	1	Fruit-bearing shrubs	F
Southern tropical wet evergreen forests	0	Fruit bearing trees	
Nilgiri sub-tropical evergreen forest	0	Epiphyte patches	
Southern wet temperate forests (sholas)	0	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	1	Cliffs, talus, and ledges	
Riparian fringing forests	1	Caves	
Southern tropical dry deciduous forests	2	Overhangs	
Wet grassland habitat on hill plateaus	0	Dens (existing burrows dug by animals)	
Rivers	0	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	
Teak plantations	1	Rock outcrops	
Coffee and cardamom	0	Sandy banks and sand spits	
Tea	0	Salt licks (exposed mineral soils)	
Wattle	0	Earth cuttings	
Pinus	0	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	X
		Mid stage	X
		Late stage	
		Old-growth stage - unmanaged	
		Other - unmanaged	X
Additional / other (specify)			
Key ecological functions			
Sensitivity to anthropogenic disturbance		B,I,K,R,S,U,X	

Vernacular name		Pompadour Green Pigeon	
Scientific name		<i>Treron pompadora</i>	
Taxonomic class	B	Trophic category	Fr
Legal Status - Wildlife Protection Act	SIV	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN		Snags	
Endemism status	No	Snag recruits (dying trees, live trees with dead portions)	
Residency status	P	Hollow trees, chimney trees (living or dead)	
Conservation area	A	Tree cavities (natural or created)	
Abundance / distribution status	C	Large old trees (living)	F
Conflict with humans		Trees with fluting boles and buttresses	
Champion and Seth Forest Types of India (to the group level):		Down wood	
Southern catch thorn forests	0	Litter and duff layers	
Southern tropical dry deciduous forests – dry teak forest	0	Litter in streams	
Southern tropical moist deciduous forest	1	Lianas	
Southern moist and wet bamboo brakes	1	Fruit-bearing shrubs	F
Southern tropical wet evergreen forests	2	Fruit bearing trees	F
Nilgiri sub-tropical evergreen forest	2	Epiphyte patches	
Southern wet temperate forests (sholas)	2	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	1	Cliffs, talus, and ledges	
Riparian fringing forests	2	Caves	
Southern tropical dry deciduous forests	0	Overhangs	
Wet grassland habitat on hill plateaus	0	Dens (existing burrows dug by animals)	
Rivers	0	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	
Teak plantations	0	Rock outcrops	
Coffee and cardamom	1	Sandy banks and sand spits	
Tea	0	Salt licks (exposed mineral soils)	
Wattle	1	Earth cuttings	
Pinus	1	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	
		Mid stage	
		Late stage	X
		Old-growth stage - unmanaged	X
		Other - unmanaged	
Additional / other (specify)			
Key ecological functions		B	
Sensitivity to anthropogenic disturbance		D,G,I,S,U,X	

Vernacular name		Wood Sandpiper	
Scientific name		<i>Tringa glareola</i>	
Taxonomic class	B	Trophic category	Ca
Legal Status - Wildlife Protection Act	SIV	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN		Snags	
Endemism status	No	Snag recruits (dying trees, live trees with dead portions)	
Residency status	M	Hollow trees, chimney trees (living or dead)	
Conservation area	A+	Tree cavities (natural or created)	
Abundance / distribution status	A	Large old trees (living)	
Conflict with humans		Trees with fluting boles and buttresses	
Champion and Seth Forest Types of India (to the group level):		Down wood	
Southern catch thorn forests	1	Litter and duff layers	F
Southern tropical dry deciduous forests – dry teak forest	1	Litter in streams	F
Southern tropical moist deciduous forest	1	Lianas	
Southern moist and wet bamboo brakes	1	Fruit-bearing shrubs	
Southern tropical wet evergreen forests	1	Fruit bearing trees	
Nilgiri sub-tropical evergreen forest	1	Epiphyte patches	
Southern wet temperate forests (sholas)	1	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	1	Cliffs, talus, and ledges	
Riparian fringing forests	1	Caves	
Southern tropical dry deciduous forests	1	Overhangs	
Wet grassland habitat on hill plateaus	1	Dens (existing burrows dug by animals)	
Rivers	1	Sheet rocks	
Reservoirs	1	Large bouldery aggregates	
Teak plantations	1	Rock outcrops	
Coffee and cardamom	1	Sandy banks and sand spits	F
Tea	1	Salt licks (exposed mineral soils)	
Wattle	1	Earth cuttings	
Pinus	1	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	X
		Mid stage	X
		Late stage	X
		Old-growth stage - unmanaged	X
		Other - unmanaged	X
Additional / other (specify)			
Key ecological functions			
Sensitivity to anthropogenic disturbance		E,J,N,R,W	

Vernacular name		Vernal Hanging Parrot	
Scientific name		<i>Loriculus vernalis</i>	
Taxonomic class	B	Trophic category	He
Legal Status - Wildlife Protection Act	SIV	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN		Snags	
Endemism status	No	Snag recruits (dying trees, live trees with dead portions)	B
Residency status	P	Hollow trees, chimney trees (living or dead)	B
Conservation area	A+	Tree cavities (natural or created)	B
Abundance / distribution status	A	Large old trees (living)	F
Conflict with humans		Trees with fluting boles and buttresses	
Champion and Seth Forest Types of India (to the group level):		Down wood	
Southern catch thorn forests	0	Litter and duff layers	
Southern tropical dry deciduous forests – dry teak forest	0	Litter in streams	
Southern tropical moist deciduous forest	1	Lianas	
Southern moist and wet bamboo brakes	1	Fruit-bearing shrubs	F
Southern tropical wet evergreen forests	2	Fruit bearing trees	F
Nilgiri sub-tropical evergreen forest	2	Epiphyte patches	F
Southern wet temperate forests (sholas)	2	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	1	Cliffs, talus, and ledges	
Riparian fringing forests	2	Caves	
Southern tropical dry deciduous forests	1	Overhangs	
Wet grassland habitat on hill plateaus	0	Dens (existing burrows dug by animals)	
Rivers	0	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	
Teak plantations	0	Rock outcrops	
Coffee and cardamom	1	Sandy banks and sand spits	
Tea	0	Salt licks (exposed mineral soils)	
Wattle	0	Earth cuttings	
Pinus	0	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	
		Mid stage	X
		Late stage	X
		Old-growth stage - unmanaged	X
		Other - unmanaged	
Additional / other (specify)			
Key ecological functions		A,B	
Sensitivity to anthropogenic disturbance		F,K,T,X	

Vernacular name		Manipur Bush Quail	
Scientific name		<i>Perdica manipurensis</i>	
Taxonomic class	B	Trophic category	Gr
Legal Status - Wildlife Protection Act	SIV	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN		Snags	
Endemism status	No	Snag recruits (dying trees, live trees with dead portions)	
Residency status	P	Hollow trees, chimney trees (living or dead)	
Conservation area	A,G	Tree cavities (natural or created)	
Abundance / distribution status	C	Large old trees (living)	
Conflict with humans		Trees with fluting boles and buttresses	
Champion and Seth Forest Types of India (to the group level):		Down wood	F
Southern catch thorn forests	2	Litter and duff layers	F
Southern tropical dry deciduous forests – dry teak forest	1	Litter in streams	F
Southern tropical moist deciduous forest	0	Lianas	
Southern moist and wet bamboo brakes	0	Fruit-bearing shrubs	F
Southern tropical wet evergreen forests	0	Fruit bearing trees	
Nilgiri sub-tropical evergreen forest	0	Epiphyte patches	
Southern wet temperate forests (sholas)	0	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	0	Cliffs, talus, and ledges	
Riparian fringing forests	0	Caves	
Southern tropical dry deciduous forests	1	Overhangs	
Wet grassland habitat on hill plateaus	2	Dens (existing burrows dug by animals)	
Rivers	0	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	F
Teak plantations	1	Rock outcrops	F
Coffee and cardamom	0	Sandy banks and sand spits	
Tea	0	Salt licks (exposed mineral soils)	
Wattle	0	Earth cuttings	
Pinus	0	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	X
		Mid stage	
		Late stage	
		Old-growth stage - unmanaged	
		Other - unmanaged	
Additional / other (specify)			
Key ecological functions			
Sensitivity to anthropogenic disturbance		B,I,R,U,X	

Vernacular name		Malabar Parakeet	
Scientific name		<i>Psittacula columboides</i>	
Taxonomic class	B	Trophic category	Fr
Legal Status - Wildlife Protection Act	SIV	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN		Snags	B
Endemism status	ER	Snag recruits (dying trees, live trees with dead portions)	B
Residency status	P	Hollow trees, chimney trees (living or dead)	B
Conservation area	A	Tree cavities (natural or created)	B
Abundance / distribution status	A	Large old trees (living)	B
Conflict with humans		Trees with fluting boles and buttresses	
Champion and Seth Forest Types of India (to the group level):		Down wood	
Southern catch thorn forests	0	Litter and duff layers	
Southern tropical dry deciduous forests - dry teak forest	0	Litter in streams	
Southern tropical moist deciduous forest	2	Lianas	
Southern moist and wet bamboo brakes	1	Fruit-bearing shrubs	F
Southern tropical wet evergreen forests	2	Fruit bearing trees	F
Nilgiri sub-tropical evergreen forest	2	Epiphyte patches	F
Southern wet temperate forests (sholas)	1	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	2	Cliffs, talus, and ledges	
Riparian fringing forests	2	Caves	
Southern tropical dry deciduous forests	1	Overhangs	
Wet grassland habitat on hill plateaus	0	Dens (existing burrows dug by animals)	
Rivers	0	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	
Teak plantations	1	Rock outcrops	
Coffee and cardamom	1	Sandy banks and sand spits	
Tea	0	Salt licks (exposed mineral soils)	
Wattle	0	Earth cuttings	
Pinus	0	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	
		Mid stage	
		Late stage	X
		Old-growth stage - unmanaged	X
		Other - unmanaged	
Additional / other (specify)			
Key ecological functions			
Sensitivity to anthropogenic disturbance			

Vernacular name		White-browed Bulbul	
Scientific name		<i>Pycnonotus luteolus</i>	
Taxonomic class	B	Trophic category	He
Legal Status - Wildlife Protection Act	SIV	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN		Snags	
Endemism status	ER	Snag recruits (dying trees, live trees with dead portions)	
Residency status	P	Hollow trees, chimney trees (living or dead)	
Conservation area	A	Tree cavities (natural or created)	
Abundance / distribution status	C	Large old trees (living)	
Conflict with humans		Trees with fluting boles and buttresses	
Champion and Seth Forest Types of India (to the group level):		Down wood	
Southern catch thorn forests	2	Litter and duff layers	F
Southern tropical dry deciduous forests – dry teak forest	2	Litter in streams	
Southern tropical moist deciduous forest	1	Lianas	
Southern moist and wet bamboo brakes	0	Fruit-bearing shrubs	F
Southern tropical wet evergreen forests	0	Fruit bearing trees	F
Nilgiri sub-tropical evergreen forest	0	Epiphyte patches	B
Southern wet temperate forests (sholas)	0	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	0	Cliffs, talus, and ledges	
Riparian fringing forests	0	Caves	
Southern tropical dry deciduous forests	2	Overhangs	
Wet grassland habitat on hill plateaus	0	Dens (existing burrows dug by animals)	
Rivers	0	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	
Teak plantations	1	Rock outcrops	
Coffee and cardamom	1	Sandy banks and sand spits	
Tea	0	Salt licks (exposed mineral soils)	
Wattle	0	Earth cuttings	
Pinus	0	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	X
		Mid stage	X
		Late stage	
		Old-growth stage - unmanaged	
		Other - unmanaged	
Additional / other (specify)			
Key ecological functions		B	
Sensitivity to anthropogenic disturbance		B,G,I,R,U	

Vernacular name		Stork-billed Kingfisher	
Scientific name		<i>Halcyon capensis</i>	
Taxonomic class	B	Trophic category	Pi
Legal Status - Wildlife Protection Act	SIV	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN		Snags	F
Endemism status	No	Snag recruits (dying trees, live trees with dead portions)	
Residency status	P	Hollow trees, chimney trees (living or dead)	
	S,T,	Tree cavities (natural or created)	
Conservation area	G	Large old trees (living)	
Abundance / distribution status	B	Trees with fluting boles and buttresses	
Conflict with humans		Down wood	
Champion and Seth Forest Types of India (to the group level):		Litter and duff layers	
Southern catch thorn forests	1	Litter in streams	
Southern tropical dry deciduous forests – dry teak forest	1	Lianas	
Southern tropical moist deciduous forest	1	Fruit-bearing shrubs	
Southern moist and wet bamboo brakes	1	Fruit bearing trees	
Southern tropical wet evergreen forests	1	Epiphyte patches	
Nilgiri sub-tropical evergreen forest	1	Habitat elements of geomorphic origin	
Southern wet temperate forests (sholas)	1	Cliffs, talus, and ledges	
South Indian tropical moist deciduous mixed forests	1	Caves	
Riparian fringing forests	2	Overhangs	
Southern tropical dry deciduous forests	1	Dens (existing burrows dug by animals)	B
Wet grassland habitat on hill plateaus	1	Sheet rocks	
Rivers	2	Large bouldery aggregates	
Reservoirs	2	Rock outcrops	
Teak plantations	1	Sandy banks and sand spits	
Coffee and cardamom	1	Salt licks (exposed mineral soils)	
Tea	0	Earth cuttings	
Wattle	1	Man-made (anthropogenic) structures	B
Pinus	1	Structural stage	
		Early stage	X
		Mid stage	X
		Late stage	X
		Old-growth stage - unmanaged	X
		Other - unmanaged	X
Additional / other (specify)			
Key ecological functions			
Sensitivity to anthropogenic disturbance			

Vernacular name		Grey-headed Fish-Eagle	
Scientific name		<i>Ichthyophaga ichthyaetus</i>	
Taxonomic class	B	Trophic category	Pi
Legal Status - Wildlife Protection Act	SIV	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN		Snags	F
Endemism status	No	Snag recruits (dying trees, live trees with dead portions)	F
Residency status	P	Hollow trees, chimney trees (living or dead)	
Conservation area	A+	Tree cavities (natural or created)	
Abundance / distribution status	C	Large old trees (living)	B
Conflict with humans		Trees with fluting boles and buttresses	
Champion and Seth Forest Types of India (to the group level):		Down wood	
Southern catch thorn forests	1	Litter and duff layers	
Southern tropical dry deciduous forests – dry teak forest	1	Litter in streams	F
Southern tropical moist deciduous forest	1	Lianas	
Southern moist and wet bamboo brakes	1	Fruit-bearing shrubs	
Southern tropical wet evergreen forests	1	Fruit bearing trees	
Nilgiri sub-tropical evergreen forest	1	Epiphyte patches	
Southern wet temperate forests (sholas)	1	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	1	Cliffs, talus, and ledges	
Riparian fringing forests	2	Caves	
Southern tropical dry deciduous forests	1	Overhangs	
Wet grassland habitat on hill plateaus	0	Dens (existing burrows dug by animals)	
Rivers	2	Sheet rocks	
Reservoirs	2	Large bouldery aggregates	F
Teak plantations	1	Rock outcrops	
Coffee and cardamom	1	Sandy banks and sand spits	
Tea	0	Salt licks (exposed mineral soils)	
Wattle	0	Earth cuttings	
Pinus	0	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	
		Mid stage	
		Late stage	X
		Old-growth stage - unmanaged	X
		Other - unmanaged	
Additional / other (specify)			
Key ecological functions			
Sensitivity to anthropogenic disturbance		J,K,N,T,U,AA	

Vernacular name		Brown-capped Pygmy Woodpecker	
Scientific name		<i>Dendrocopos nanus</i>	
Taxonomic class	B	Trophic category	In
Legal Status - Wildlife Protection Act	SIV	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN		Snags	B,F
Endemism status	No	Snag recruits (dying trees, live trees with dead portions)	B,F
Residency status	P	Hollow trees, chimney trees (living or dead)	B,F
Conservation area	A+	Tree cavities (natural or created)	B,F
Abundance / distribution status	B	Large old trees (living)	B,F
Conflict with humans		Trees with fluting boles and buttresses	F
Champion and Seth Forest Types of India (to the group level):		Down wood	
Southern catch thorn forests	2	Litter and duff layers	
Southern tropical dry deciduous forests – dry teak forest	2	Litter in streams	
Southern tropical moist deciduous forest	1	Lianas	
Southern moist and wet bamboo brakes	0	Fruit-bearing shrubs	
Southern tropical wet evergreen forests	0	Fruit bearing trees	
Nilgiri sub-tropical evergreen forest	0	Epiphyte patches	
Southern wet temperate forests (sholas)	0	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	1	Cliffs, talus, and ledges	
Riparian fringing forests	1	Caves	
Southern tropical dry deciduous forests	2	Overhangs	
Wet grassland habitat on hill plateaus	0	Dens (existing burrows dug by animals)	
Rivers	0	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	
Teak plantations	1	Rock outcrops	
Coffee and cardamom	1	Sandy banks and sand spits	
Tea	0	Salt licks (exposed mineral soils)	
Wattle	0	Earth cuttings	
Pinus	0	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	
		Mid stage	
		Late stage	X
		Old-growth stage - unmanaged	X
		Other - unmanaged	X
Additional / other (specify)			
Key ecological functions			
Sensitivity to anthropogenic disturbance			

Vernacular name		Black-and-orange Flycatcher	
Scientific name		<i>Ficedula nigrorufa</i>	
Taxonomic class	B	Trophic category	In
Legal Status - Wildlife Protection Act	SIV	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN		Snags	
Endemism status	ER	Snag recruits (dying trees, live trees with dead portions)	
Residency status	P	Hollow trees, chimney trees (living or dead)	
Conservation area	A	Tree cavities (natural or created)	
Abundance / distribution status	B	Large old trees (living)	
Conflict with humans		Trees with fluting boles and buttresses	
Champion and Seth Forest Types of India (to the group level):		Down wood	
Southern catch thorn forests	0	Litter and duff layers	F
Southern tropical dry deciduous forests – dry teak forest	0	Litter in streams	
Southern tropical moist deciduous forest	1	Lianas	
Southern moist and wet bamboo brakes	1	Fruit-bearing shrubs	F
Southern tropical wet evergreen forests	2	Fruit bearing trees	
Nilgiri sub-tropical evergreen forest	2	Epiphyte patches	B,F
Southern wet temperate forests (sholas)	2	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	1	Cliffs, talus, and ledges	
Riparian fringing forests	0	Caves	
Southern tropical dry deciduous forests	0	Overhangs	
Wet grassland habitat on hill plateaus	0	Dens (existing burrows dug by animals)	
Rivers	0	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	
Teak plantations	0	Rock outcrops	
Coffee and cardamom	1	Sandy banks and sand spits	
Tea	0	Salt licks (exposed mineral soils)	
Wattle	0	Earth cuttings	
Pinus	0	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	
		Mid stage	
		Late stage	X
		Old-growth stage - unmanaged	X
		Other - unmanaged	
Additional / other (specify)		Thick undergrowth	
Key ecological functions			
Sensitivity to anthropogenic disturbance		A,B,D,I,U	

Vernacular name		Brown-headed Barbet	
Scientific name		<i>Megalaima zeylanica</i>	
Taxonomic class	B	Trophic category	Fr
Legal Status - Wildlife Protection Act	SIV	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN		Snags	B,F
Endemism status	No	Snag recruits (dying trees, live trees with dead portions)	B,F
Residency status	P	Hollow trees, chimney trees (living or dead)	B
Conservation area	A+	Tree cavities (natural or created)	B
Abundance / distribution status	A	Large old trees (living)	F
Conflict with humans		Trees with fluting boles and buttresses	
Champion and Seth Forest Types of India (to the group level):		Down wood	
Southern catch thorn forests	1	Litter and duff layers	
Southern tropical dry deciduous forests – dry teak forest	1	Litter in streams	
Southern tropical moist deciduous forest	1	Lianas	
Southern moist and wet bamboo brakes	0	Fruit-bearing shrubs	F
Southern tropical wet evergreen forests	2	Fruit bearing trees	F
Nilgiri sub-tropical evergreen forest	1	Epiphyte patches	F
Southern wet temperate forests (sholas)	2	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	2	Cliffs, talus, and ledges	
Riparian fringing forests	2	Caves	
Southern tropical dry deciduous forests	1	Overhangs	
Wet grassland habitat on hill plateaus	0	Dens (existing burrows dug by animals)	
Rivers	0	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	
Teak plantations	0	Rock outcrops	
Coffee and cardamom	1	Sandy banks and sand spits	
Tea	1	Salt licks (exposed mineral soils)	
Wattle	0	Earth cuttings	
Pinus	0	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	X
		Mid stage	X
		Late stage	X
		Old-growth stage - unmanaged	X
		Other - unmanaged	X
Additional / other (specify)			
Key ecological functions		B	
Sensitivity to anthropogenic disturbance		F,I,K,S,U	

Vernacular name		Blue-bearded Bee-eater	
Scientific name		<i>Nyctyornis athertoni</i>	
Taxonomic class	B	Trophic category	In
Legal Status - Wildlife Protection Act	SIV	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN		Snags	F
Endemism status	No	Snag recruits (dying trees, live trees with dead portions)	F
Residency status	P	Hollow trees, chimney trees (living or dead)	F
Conservation area	A,G	Tree cavities (natural or created)	
Abundance / distribution status	B	Large old trees (living)	
Conflict with humans		Trees with fluting boles and buttresses	
Champion and Seth Forest Types of India (to the group level):		Down wood	
Southern catch thorn forests	1	Litter and duff layers	
Southern tropical dry deciduous forests – dry teak forest	1	Litter in streams	
Southern tropical moist deciduous forest	2	Lianas	
Southern moist and wet bamboo brakes	1	Fruit-bearing shrubs	
Southern tropical wet evergreen forests	2	Fruit bearing trees	
Nilgiri sub-tropical evergreen forest	1	Epiphyte patches	
Southern wet temperate forests (sholas)	1	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	2	Cliffs, talus, and ledges	
Riparian fringing forests	2	Caves	
Southern tropical dry deciduous forests	1	Overhangs	
Wet grassland habitat on hill plateaus	0	Dens (existing burrows dug by animals)	
Rivers	0	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	
Teak plantations	1	Rock outcrops	
Coffee and cardamom	1	Sandy banks and sand spits	B
Tea	0	Salt licks (exposed mineral soils)	
Wattle	0	Earth cuttings	B
Pinus	0	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	X
		Mid stage	X
		Late stage	X
		Old-growth stage - unmanaged	X
		Other - unmanaged	X
Additional / other (specify)			
Key ecological functions			
Sensitivity to anthropogenic disturbance		A,E,H,I,M,O,	

Vernacular name		Broad-tailed Grassbird	
Scientific name		<i>Schoenicola platyura</i>	
Taxonomic class	B	Trophic category	In
Legal Status - Wildlife Protection Act	SIV	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN		Snags	
Endemism status	ER	Snag recruits (dying trees, live trees with dead portions)	
Residency status	P	Hollow trees, chimney trees (living or dead)	
Conservation area	A	Tree cavities (natural or created)	
Abundance / distribution status	C	Large old trees (living)	
Conflict with humans		Trees with fluting boles and buttresses	
Champion and Seth Forest Types of India (to the group level):		Down wood	
Southern catch thorn forests	0	Litter and duff layers	
Southern tropical dry deciduous forests – dry teak forest	0	Litter in streams	
Southern tropical moist deciduous forest	0	Lianas	
Southern moist and wet bamboo brakes	0	Fruit-bearing shrubs	
Southern tropical wet evergreen forests	0	Fruit bearing trees	
Nilgiri sub-tropical evergreen forest	1	Epiphyte patches	
Southern wet temperate forests (sholas)	1	Habitat elements of geomorphic origin	?
South Indian tropical moist deciduous mixed forests	0	Cliffs, talus, and ledges	?
Riparian fringing forests	0	Caves	?
Southern tropical dry deciduous forests	0	Overhangs	?
Wet grassland habitat on hill plateaus	2	Dens (existing burrows dug by animals)	?
Rivers	0	Sheet rocks	?
Reservoirs	0	Large bouldery aggregates	?
Teak plantations	0	Rock outcrops	?
Coffee and cardamom	0	Sandy banks and sand spits	?
Tea	0	Salt licks (exposed mineral soils)	?
Wattle	0	Earth cuttings	?
Pinus	0	Man-made (anthropogenic) structures	?
		Structural stage	?
		Early stage	?
		Mid stage	?
		Late stage	?
		Old-growth stage - unmanaged	?
		Other - unmanaged	?
Additional / other (specify)			?
Key ecological functions			?
Sensitivity to anthropogenic disturbance			?

Vernacular name		Liontailed Macaque	
Scientific name		<i>Macaca silenus</i>	
Taxonomic class	M	Trophic category	Om
Legal Status - Wildlife Protection Act	SI	Habitat elements/substrates	
Legal Status - CITES	?	Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN	EN	Snags	
Endemism status	ER	Snag recruits (dying trees, live trees with dead portions)	
Residency status	P	Hollow trees, chimney trees (living or dead)	
Conservation area	A	Tree cavities (natural or created)	
Abundance / distribution status	C	Large old trees (living)	B,F
Conflict with humans		Trees with fluting boles and buttresses	
Champion and Seth Forest Types of India (to the group level):		Down wood	
Southern catch thorn forests	0	Litter and duff layers	
Southern tropical dry deciduous forests – dry teak forest	0	Litter in streams	
Southern tropical moist deciduous forest	1	Lianas	OTH
Southern moist and wet bamboo brakes	0	Fruit-bearing shrubs	
Southern tropical wet evergreen forests	2	Fruit bearing trees	F
Nilgiri sub-tropical evergreen forest	0	Epiphyte patches	
Southern wet temperate forests (sholas)	1	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	1	Cliffs, talus, and ledges	
Riparian fringing forests	1	Caves	
Southern tropical dry deciduous forests	0	Overhangs	
Wet grassland habitat on hill plateaus	0	Dens (existing burrows dug by animals)	
Rivers	0	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	
Teak plantations	0	Rock outcrops	
Coffee and cardamom	1	Sandy banks and sand spits	
Tea	0	Salt licks (exposed mineral soils)	
Wattle	0	Earth cuttings	
Pinus	0	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	
		Mid stage	
		Late stage	X
		Old-growth stage - unmanaged	X
		Other - unmanaged	
Additional / other (specify)			
Key ecological functions		B	
Sensitivity to anthropogenic disturbance		A,C,F,G,I,J,O,Q,DD	

Vernacular name		Nilgiri langur	
Scientific name		<i>Presbytis johni</i>	
Taxonomic class	M	Trophic category	He
Legal Status - Wildlife Protection Act	SI	Habitat elements/substrates	
Legal Status - CITES	?	Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN	VU	Snags	
Endemism status	ER	Snag recruits (dying trees, live trees with dead portions)	
Residency status	P	Hollow trees, chimney trees (living or dead)	
Conservation area	A	Tree cavities (natural or created)	
Abundance / distribution status	B	Large old trees (living)	B,F
Conflict with humans	C	Trees with fluting boles and buttresses	
Champion and Seth Forest Types of India (to the group level):		Down wood	
Southern catch thorn forests	0	Litter and duff layers	
Southern tropical dry deciduous forests – dry teak forest	2	Litter in streams	
Southern tropical moist deciduous forest	2	Lianas	F
Southern moist and wet bamboo brakes	1	Fruit-bearing shrubs	
Southern tropical wet evergreen forests	2	Fruit bearing trees	F
Nilgiri sub-tropical evergreen forest	2	Epiphyte patches	F
Southern wet temperate forests (sholas)	2	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	2	Cliffs, talus, and ledges	
Riparian fringing forests	1	Caves	
Southern tropical dry deciduous forests	2	Overhangs	
Wet grassland habitat on hill plateaus	0	Dens (existing burrows dug by animals)	
Rivers	0	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	
Teak plantations	1	Rock outcrops	
Coffee and cardamom	2	Sandy banks and sand spits	
Tea	0	Salt licks (exposed mineral soils)	
Wattle	1	Earth cuttings	
Pinus	1	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	X
		Mid stage	X
		Late stage	X
		Old-growth stage - unmanaged	X
		Other - unmanaged	
Additional / other (specify)			
Key ecological functions		A,B	
Sensitivity to anthropogenic disturbance		A,C,E,F,G,I,M,Q	

Vernacular name		Slender Loris	
Scientific name		<i>Loris tardigradus</i>	
Taxonomic class	M	Trophic category	In
Legal Status - Wildlife Protection Act	SI	Habitat elements/substrates	
Legal Status - CITES	?	Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN	VU	Snags	
Endemism status	ER	Snag recruits (dying trees, live trees with dead portions)	
Residency status	P	Hollow trees, chimney trees (living or dead)	
Conservation area	A,S?	Tree cavities (natural or created)	F
Abundance / distribution status	D	Large old trees (living)	small trees, shrubs
Conflict with humans		Trees with fluting boles and buttresses	
Champion and Seth Forest Types of India (to the group level):		Down wood	
Southern catch thorn forests	2	Litter and duff layers	
Southern tropical dry deciduous forests – dry teak forest	1	Litter in streams	
Southern tropical moist deciduous forest	1	Lianas	
Southern moist and wet bamboo brakes	1	Fruit-bearing shrubs	
Southern tropical wet evergreen forests	1	Fruit bearing trees	
Nilgiri sub-tropical evergreen forest	?	Epiphyte patches	
Southern wet temperate forests (sholas)	0	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	1	Cliffs, talus, and ledges	
Riparian fringing forests	0	Caves	
Southern tropical dry deciduous forests	1	Overhangs	
Wet grassland habitat on hill plateaus	0	Dens (existing burrows dug by animals)	
Rivers	0	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	
Teak plantations	1	Rock outcrops	
Coffee and cardamom	0	Sandy banks and sand spits	
Tea	0	Salt licks (exposed mineral soils)	
Wattle	0	Earth cuttings	
Pinus	0	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	
		Mid stage	
		Late stage	X
		Old-growth stage - unmanaged	X
		Other - unmanaged	
Additional / other (specify)			
Key ecological functions			
Sensitivity to anthropogenic disturbance		A,E,H,I,M,O,	

Vernacular name		Nilgiri Tahr	
Scientific name		<i>Hemitragus hylocrius</i>	
Taxonomic class	M	Trophic category	He
Legal Status - Wildlife Protection Act	SI	Habitat elements/substrates	
Legal Status - CITES	?	Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN	VU	Snags	
Endemism status	ER	Snag recruits (dying trees, live trees with dead portions)	
Residency status	P	Hollow trees, chimney trees (living or dead)	
Conservation area	A	Tree cavities (natural or created)	
Abundance / distribution status	C?	Large old trees (living)	
Conflict with humans		Trees with fluting boles and buttresses	
Champion and Seth Forest Types of India (to the group level):		Down wood	
Southern cutch thorn forests	0	Litter and duff layers	
Southern tropical dry deciduous forests – dry teak forest	0	Litter in streams	
Southern tropical moist deciduous forest	0	Lianas	
Southern moist and wet bamboo brakes	0	Fruit-bearing shrubs	
Southern tropical wet evergreen forests	0	Fruit bearing trees	
Nilgiri sub-tropical evergreen forest	0	Epiphyte patches	
Southern wet temperate forests (sholas)	0	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	0	Cliffs, talus, and ledges	F
Riparian fringing forests	0	Caves	
Southern tropical dry deciduous forests	0	Overhangs	
Wet grassland habitat on hill plateaus	2	Dens (existing burrows dug by animals)	X
Rivers	0	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	
Teak plantations	0	Rock outcrops	
Coffee and cardamom	0	Sandy banks and sand spits	
Tea	0	Salt licks (exposed mineral soils)	
Wattle	0	Earth cuttings	
Pinus	0	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	
		Mid stage	
		Late stage	
		Old-growth stage - unmanaged	
		Other - unmanaged	
Additional / other (specify)			
Key ecological functions			
Sensitivity to anthropogenic disturbance		A,B,J,M,O,AA,CC	

Vernacular name		Indian Elephant	
Scientific name		<i>Elephas maximus</i>	
Taxonomic class	M	Trophic category	He
Legal Status - Wildlife Protection Act	SI	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN		Snags	
Endemism status	No	Snag recruits (dying trees, live trees with dead portions)	
Residency status	P	Hollow trees, chimney trees (living or dead)	
Conservation area	A+	Tree cavities (natural or created)	
Abundance / distribution status	A	Large old trees (living)	F
Conflict with humans	K,H, C	Trees with fluting boles and buttresses	
Champion and Seth Forest Types of India (to the group level):		Down wood	
Southern catch thorn forests	2	Litter and duff layers	
Southern tropical dry deciduous forests – dry teak forest	2	Litter in streams	
Southern tropical moist deciduous forest	2	Lianas	F
Southern moist and wet bamboo brakes	2	Fruit-bearing shrubs	F
Southern tropical wet evergreen forests	2	Fruit bearing trees	F
Nilgiri sub-tropical evergreen forest	2	Epiphyte patches	F
Southern wet temperate forests (sholas)	2	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	2	Cliffs, talus, and ledges	
Riparian fringing forests	2	Caves	
Southern tropical dry deciduous forests	2	Overhangs	
Wet grassland habitat on hill plateaus	2	Dens (existing burrows dug by animals)	
Rivers	1	Sheet rocks	
Reservoirs	1	Large bouldery aggregates	
Teak plantations	2	Rock outcrops	
Coffee and cardamom	1	Sandy banks and sand spits	
Tea	1	Salt licks (exposed mineral soils)	F
Wattle	1	Earth cuttings	
Pinus	1	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	X
		Mid stage	X
		Late stage	X
		Old-growth stage - unmanaged	X
		Other – unmanaged	X
Additional / other (specify)			
Key ecological functions		B	
Sensitivity to anthropogenic disturbance		A,B,C,D,E,F,G,I,L,M,O,R,S,U,X,Y	

Vernacular name		Nilgiri Marten	
Scientific name		<i>Martes gwatkensi</i>	
Taxonomic class	M	Trophic category	Ca
Legal Status - Wildlife Protection Act	SII	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN		Snags	F
Endemism status	ER	Snag recruits (dying trees, live trees with dead portions)	F
Residency status	P	Hollow trees, chimney trees (living or dead)	B,F
Conservation area	A	Tree cavities (natural or created)	B,F
Abundance / distribution status	D	Large old trees (living)	F
Conflict with humans		Trees with fluting boles and buttresses	F
Champion and Seth Forest Types of India (to the group level):		Down wood	F
Southern catch thorn forests	0	Litter and duff layers	F
Southern tropical dry deciduous forests – dry teak forest	1	Litter in streams	F
Southern tropical moist deciduous forest	2	Lianas	F
Southern moist and wet bamboo brakes	2	Fruit-bearing shrubs	F
Southern tropical wet evergreen forests	2	Fruit bearing trees	F
Nilgiri sub-tropical evergreen forest	2	Epiphyte patches	F
Southern wet temperate forests (sholas)	2	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	2	Cliffs, talus, and ledges	
Riparian fringing forests	2	Caves	
Southern tropical dry deciduous forests	1	Overhangs	
Wet grassland habitat on hill plateaus	0	Dens (existing burrows dug by animals)	
Rivers	0	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	
Teak plantations	0	Rock outcrops	
Coffee and cardamom	0	Sandy banks and sand spits	
Tea	0	Salt licks (exposed mineral soils)	
Wattle	0	Earth cuttings	
Pinus	0	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	
		Mid stage	
		Late stage	X
		Old-growth stage - unmanaged	X
		Other - unmanaged	
Additional / other (specify)			
Key ecological functions			
Sensitivity to anthropogenic disturbance		A,B,D,F,G,I,S,T,U,X	

Vernacular name		Grizzled Giant Squirrel	
Scientific name		<i>Ratufa macroura</i>	
Taxonomic class	M	Trophic category	
Legal Status - Wildlife Protection Act	SI	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN		Snags	
Endemism status	ER	Snag recruits (dying trees, live trees with dead portions)	
Residency status	P	Hollow trees, chimney trees (living or dead)	
Conservation area	A	Tree cavities (natural or created)	
Abundance / distribution status	D	Large old trees (living)	
Conflict with humans		Trees with fluting boles and buttresses	
Champion and Seth Forest Types of India (to the group level):		Down wood	
Southern cutch thorn forests	2	Litter and duff layers	
Southern tropical dry deciduous forests – dry teak forest	2	Litter in streams	
Southern tropical moist deciduous forest	1	Lianas	
Southern moist and wet bamboo brakes	0	Fruit-bearing shrubs	
Southern tropical wet evergreen forests	0	Fruit bearing trees	
Nilgiri sub-tropical evergreen forest	0	Epiphyte patches	
Southern wet temperate forests (sholas)	0	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	1	Cliffs, talus, and ledges	
Riparian fringing forests	2	Caves	
Southern tropical dry deciduous forests	2	Overhangs	
Wet grassland habitat on hill plateaus	0	Dens (existing burrows dug by animals)	
Rivers	0	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	
Teak plantations	0	Rock outcrops	
Coffee and cardamom	0	Sandy banks and sand spits	
Tea	0	Salt licks (exposed mineral soils)	
Wattle	0	Earth cuttings	
Pinus	0	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	
		Mid stage	
		Late stage	
		Old-growth stage - unmanaged	
		Other - unmanaged	
Additional / other (specify)			
Key ecological functions			
Sensitivity to anthropogenic disturbance			

Vernacular name		King Cobra	
Scientific name		<i>Ophiophagus hanna</i>	
Taxonomic class	R	Trophic category	Ca
Legal Status - Wildlife Protection Act	SII	Habitat elements/substrates	
Legal Status - CITES	?	Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN	LR	Snags	
Endemism status	No	Snag recruits (dying trees, live trees with dead portions)	
Residency status	P	Hollow trees, chimney trees (living or dead)	
Conservation area	A,S?	Tree cavities (natural or created)	
Abundance / distribution status	C	Large old trees (living)	
Conflict with humans		Trees with fluting boles and buttresses	
Champion and Seth Forest Types of India (to the group level):		Down wood	
Southern catch thorn forests	0	Litter and duff layers	X
Southern tropical dry deciduous forests – dry teak forest	0	Litter in streams	
Southern tropical moist deciduous forest	1	Lianas	
Southern moist and wet bamboo brakes	1	Fruit-bearing shrubs	
Southern tropical wet evergreen forests	2	Fruit bearing trees	
Nilgiri sub-tropical evergreen forest	2	Epiphyte patches	
Southern wet temperate forests (sholas)	0	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	1	Cliffs, talus, and ledges	
Riparian fringing forests	0	Caves	
Southern tropical dry deciduous forests	0	Overhangs	
Wet grassland habitat on hill plateaus	0	Dens (existing burrows dug by animals)	
Rivers	0	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	
Teak plantations	0	Rock outcrops	
Coffee and cardamom	0	Sandy banks and sand spits	
Tea	0	Salt licks (exposed mineral soils)	
Wattle	0	Earth cuttings	
Pinus	0	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	
		Mid stage	
		Late stage	X
		Old-growth stage - unmanaged	X
		Other - unmanaged	
Additional / other (specify)			
Key ecological functions			
Sensitivity to anthropogenic disturbance		A,B,C,E,M,Q	

Vernacular name		Travancore Tortoise
Scientific name		<i>Indiostudo forsterni</i>
Taxonomic class	R	Trophic category
Legal Status - Wildlife Protection Act	SIV	Habitat elements/substrates
Legal Status - CITES		Habitat elements of biotic origin (special habitats)
Conservation status - IUCN		Snags
Endemism status	ER	Snag recruits (dying trees, live trees with dead portions)
Residency status	P	Hollow trees, chimney trees (living or dead)
Conservation area	A	Tree cavities (natural or created)
Abundance / distribution status	D	Large old trees (living)
Conflict with humans		Trees with fluting boles and buttresses
Champion and Seth Forest Types of India (to the group level):		Down wood
Southern catch thorn forests	0	Litter and duff layers
Southern tropical dry deciduous forests – dry teak forest		Litter in streams
Southern tropical moist deciduous forest		Lianas
Southern moist and wet bamboo brakes		Fruit-bearing shrubs
Southern tropical wet evergreen forests		Fruit bearing trees
Nilgiri sub-tropical evergreen forest		Epiphyte patches
Southern wet temperate forests (sholas)		Habitat elements of geomorphic origin
South Indian tropical moist deciduous mixed forests		Cliffs, talus, and ledges
Riparian fringing forests		Caves
Southern tropical dry deciduous forests		Overhangs
Wet grassland habitat on hill plateaus		Dens (existing burrows dug by animals)
Rivers		Sheet rocks
Reservoirs		Large bouldery aggregates
Teak plantations		Rock outcrops
Coffee and cardamom		Sandy banks and sand spits
Tea		Salt licks (exposed mineral soils)
Wattle		Earth cuttings
Pinus		Man-made (anthropogenic) structures
		Structural stage
		Early stage
		Mid stage
		Late stage
		Old-growth stage - unmanaged
		Other - unmanaged
Additional / other (specify)		
Key ecological functions		
Sensitivity to anthropogenic disturbance		

Vernacular name		Bamboo Pit Viper	
Scientific name		<i>Trimeresurus gramineus</i>	
Taxonomic class	R	Trophic category	Ca
Legal Status - Wildlife Protection Act	SIV	Habitat elements/substrates	
Legal Status - CITES		Habitat elements of biotic origin (special habitats)	
Conservation status - IUCN		Snags	F
Endemism status	No	Snag recruits (dying trees, live trees with dead portions)	F
Residency status	P	Hollow trees, chimney trees (living or dead)	B,F
Conservation area	A	Tree cavities (natural or created)	B,F
Abundance / distribution status	B	Large old trees (living)	F
Conflict with humans		Trees with fluting boles and buttresses	F
Champion and Seth Forest Types of India (to the group level):		Down wood	
Southern catch thorn forests	0	Litter and duff layers	
Southern tropical dry deciduous forests – dry teak forest	0	Litter in streams	
Southern tropical moist deciduous forest	1	Lianas	B,F
Southern moist and wet bamboo brakes	2	Fruit-bearing shrubs	
Southern tropical wet evergreen forests	2	Fruit bearing trees	
Nilgiri sub-tropical evergreen forest	2	Epiphyte patches	F
Southern wet temperate forests (sholas)	2	Habitat elements of geomorphic origin	
South Indian tropical moist deciduous mixed forests	1	Cliffs, talus, and ledges	
Riparian fringing forests	2	Caves	
Southern tropical dry deciduous forests	0	Overhangs	
Wet grassland habitat on hill plateaus	0	Dens (existing burrows dug by animals)	
Rivers	0	Sheet rocks	
Reservoirs	0	Large bouldery aggregates	
Teak plantations	0	Rock outcrops	
Coffee and cardamom	0	Sandy banks and sand spits	
Tea	0	Salt licks (exposed mineral soils)	
Wattle	0	Earth cuttings	
Pinus	0	Man-made (anthropogenic) structures	
		Structural stage	
		Early stage	
		Mid stage	
		Late stage	
		Old-growth stage - unmanaged	X
		Other - unmanaged	
Additional / other (specify)			
Key ecological functions			
Sensitivity to anthropogenic disturbance		B,D,K,S,T,U	

Appendix- 3.1. The butterflies of Anamalai conservation area

S. NO.	COMMON NAME	FAMILY	CUR. LATIN NAME	END	OLD LATIN NAME
			(Harish Gaonkar)		(Wynter Blyth)
1	Southern Birdwing	Papilionidae	<i>Troides minos</i>	1	<i>Troides helena</i>
2	Common Rose	Papilionidae	<i>Pachliopta aristolochiae</i>		<i>Tros aristolochiae</i>
3	Crimson Rose	Papilionidae	<i>Pachliopta hector</i>	2	<i>Tros hector</i>
4	Common Bluebottle	Papilionidae	<i>Graphium sarpedon</i>		<i>Zetides sarpedon</i>
5	Common Jay	Papilionidae	<i>Graphium doson</i>		<i>Zetides doson</i>
6	Tailed Jay	Papilionidae	<i>Graphium agamemnon</i>		<i>Zetides agamemnon</i>
7	Spot Swordtail	Papilionidae	<i>Graphium nomius</i>		<i>Pathysa nomius</i>
8	Five-bar Swordtail	Papilionidae	<i>Graphium antiphates</i>		<i>Pathysa antiphates</i>
9	Common Mime	Papilionidae	<i>Papilio clytia</i>		<i>Chilasa clytia</i>
10	Lime	Papilionidae	<i>Papilio demoleus</i>		<i>Papilio demoleus</i>
11	Malabar Banded Swallowtail	Papilionidae	<i>Papilio liomedon</i>	1	<i>Papilio liomedon</i>
12	Malabar Raven	Papilionidae	<i>Papilio dravidarum</i>	1	<i>Papilio dravidarum</i>
13	Red Helen	Papilionidae	<i>Papilio helenus</i>		<i>Papilio helenus</i>
14	Common Mormon	Papilionidae	<i>Papilio polytes</i>		<i>Papilio polytes</i>
15	Blue Mormon	Papilionidae	<i>Papilio polymnestor</i>	2	<i>Papilio polymnestor</i>
16	Paris Peacock	Papilionidae	<i>Papilio paris</i>		<i>Papilio paris</i>
17	Malabar Banded Peacock	Papilionidae	<i>Papilio budha</i>	1	<i>Papilio budha</i>
18	Common Banded Peacock	Papilionidae	<i>Papilio crino</i>	2	<i>Papilio crino</i>
19	Common Emigrant	Pieridae	<i>Catopsilia pomona</i>		<i>Catopsilia pomona, C. crocale</i>
20	Mottled Emigrant	Pieridae	<i>Catopsilia pyranthe</i>		<i>Catopsilia pyranthe, C. florella</i>
21	Small Grass Yellow	Pieridae	<i>Eurema brigitta</i>		<i>Terias libythea</i>
22	Common Grass Yellow	Pieridae	<i>Eurema hecabe</i>		<i>Terias hecabe</i>
23	Common Jezebel	Pieridae	<i>Delias eucharis</i>	2	<i>Delias eucharis</i>
24	Psyche	Pieridae	<i>Leptosia nina</i>		<i>Leptosia nina</i>
25	Common Gull	Pieridae	<i>Cepora nerissa</i>		<i>Huphina nerissa</i>
26	Lesser Gull	Pieridae	<i>Cepora nadina</i>		<i>Huphina nadina</i>
27	Pioneer Or Caper White	Pieridae	<i>Anaphaeis aurota</i>		<i>Belenois mesentina</i>
28	Plain Puffin	Pieridae	<i>Appias indra</i>		<i>Appias indra</i>
29	Chocolate Albatross	Pieridae	<i>Appias lyncida</i>		<i>Appias lyncida</i>
30	Common Albatross	Pieridae	<i>Appias albina</i>		<i>Appias albina</i>
31	Lesser Albatross	Pieridae	<i>Appias wardii</i>	1	<i>Appias wardii</i>
32	Small Orange Tip	Pieridae	<i>Colotis etrida</i>		<i>Colotis etrida</i>
33	White Orange Tip	Pieridae	<i>Ixias marianne</i>		<i>Ixias marianne</i>
34	Yellow Orange Tip	Pieridae	<i>Ixias pyrene</i>		<i>Ixias pyrene</i>
35	Common Wanderer	Pieridae	<i>Pareronia valeria</i>		<i>Pareronia valeria</i>
36	Great Orange Tip	Pieridae	<i>Hebomoia glaucippe</i>		<i>Hebomoia glaucippe</i>

S. NO.	COMMON NAME	FAMILY	CUR. LATIN NAME	END	OLD LATIN NAME
37	Common Evening Brown	Nymphalidae	<i>Melanitis leda</i>		<i>Melanitis leda</i>
38	Dark Evening Brown	Nymphalidae	<i>Melanitis pedima</i>		<i>Melanitis pedima</i>
39	Common Palmfly	Nymphalidae	<i>Elymnias hypermenstra</i>		<i>Elymnias hypermenstra</i>
40	Bamboo Treebrown	Nymphalidae	<i>Lethe europa</i>		<i>Lethe europa</i>
41	Common Treebrown	Nymphalidae	<i>Lethe rohria</i>		<i>Lethe rohria</i>
42	Common Bushbrown	Nymphalidae	<i>Mycalesis perseus</i>		<i>Mycalesis perseus</i>
43	Dark Branded Bushbrown	Nymphalidae	<i>Mycalesis mineus</i>		<i>Mycalesis mineus</i>
44	Gladeye Bushbrown	Nymphalidae	<i>Mycalesis patnia</i>		<i>Mycalesis patnia</i>
45	Red-Disk Bushbrown	Nymphalidae	<i>Mycalesis ocellus</i>	1	<i>Mycalesis ocellus</i>
46	Nigger	Nymphalidae	<i>Orsotrianea medus</i>		<i>Orsotrianea medus</i>
47	Tamil Catseye	Nymphalidae	<i>Zipoetis saitis</i>	1	<i>Zipoetis saitis</i>
48	Common Threering	Nymphalidae	<i>Ypthima asterope</i>		<i>Ypthima asterope</i>
49	White Or Ceylon Fourring	Nymphalidae	<i>Ypthima ceylonica</i>	2	<i>Ypthima ceylonica</i>
50	Common Fourring	Nymphalidae	<i>Ypthima huebneri</i>	1	<i>Ypthima huebneri</i>
51	Common Fivering	Nymphalidae	<i>Ypthima baldus</i>		<i>Ypthima baldus</i>
52	Palni Fourring	Nymphalidae	<i>Ypthima ypthimoides</i>		<i>Ypthima ypthimoides</i>
53	Common Nawab	Nymphalidae	<i>Polyura athamas</i>		<i>Eriboea athamas</i>
54	Tawny Rajah	Nymphalidae	<i>Charaxes bernardus</i>		<i>Charaxes polyxena</i>
55	Tawny Coster	Nymphalidae	<i>Acraea violae</i>		<i>Telchinia violae</i>
56	Tamil Lacewing	Nymphalidae	<i>Cethosia nietneri</i>	2	<i>Cethosia nietneri</i>
57	Cruiser	Nymphalidae	<i>Vindula erota</i>		<i>Cynthia erota</i>
58	Rustic	Nymphalidae	<i>Cupha erymanthis</i>		<i>Cupha erymanthis</i>
59	Common Leopard	Nymphalidae	<i>Phalanta phalantha</i>		<i>Atella phalantha</i>
60	Tamil Yeoman	Nymphalidae	<i>Cirrochroa thais</i>	2	<i>Cirrochroa thais</i>
61	Indian Fritillary	Nymphalidae	<i>Argyreus hyperbius</i>		<i>Argynnus hyperbius</i>
62	Chestnut-Streaked Sailor	Nymphalidae	<i>Neptis jumbah</i>		<i>Neptis jumbah</i>
63	Common Sailor	Nymphalidae	<i>Neptis hylas</i>		<i>Neptis hylas</i>
64	Common Lascar	Nymphalidae	<i>Pantoporia hordonia</i>		<i>Neptis hordonia</i>
65	Blackvein Sergeant	Nymphalidae	<i>Athyma ranga</i>		<i>Pantoporia ranga</i>
66	Common Sergeant	Nymphalidae	<i>Athyma perius</i>		<i>Pantoporia perius</i>
67	Commander	Nymphalidae	<i>Limenitis procris</i>		<i>Limenitis procris</i>
68	Clipper	Nymphalidae	<i>Parthenos sylvia</i>		<i>Parthenos sylvia</i>
69	Grey Count	Nymphalidae	<i>Tanaecia lepidea</i>		<i>Euthalia lepidea</i>
70	Common Baron	Nymphalidae	<i>Euthalia aconthea</i>		<i>Euthalia garuda</i>
71	Gaudy Baron	Nymphalidae	<i>Euthalia lubentina</i>		<i>Euthalia lubentina</i>
72	Redspot Duke	Nymphalidae	<i>Dolpha evelina</i>		<i>Euthalia evelina</i>
73	Angled Castor	Nymphalidae	<i>Ariadne ariadne</i>		<i>Ergolis ariadne</i>
74	Common Castor	Nymphalidae	<i>Ariadne merione</i>		<i>Ergolis merione</i>
75	Common Map	Nymphalidae	<i>Cyrestis thyodamas</i>		<i>Cyrestis thyodamas</i>
76	Yellow Pansy	Nymphalidae	<i>Junonia hierta</i>		<i>Precis hierta</i>

S. NO.	COMMON NAME	FAMILY	CUR. LATIN NAME	END	OLD LATIN NAME
77	Blue Pansy	Nymphalidae	<i>Junonia orithya</i>		<i>Precis orithya</i>
78	Lemon Pansy	Nymphalidae	<i>Junonia lemonias</i>		<i>Precis lemonias</i>
79	Grey Pansy	Nymphalidae	<i>Junonia atlites</i>		<i>Precis atlites</i>
80	Chocolate Pansy	Nymphalidae	<i>Junonia iphita</i>		<i>Precis iphita</i>
81	Painted Lady	Nymphalidae	<i>Cynthia cardui</i>		<i>Venessa cardui</i>
82	Indian Red Admiral	Nymphalidae	<i>Vanessa indica</i>		<i>Venessa indica</i>
83	Blue Admiral	Nymphalidae	<i>Kaniska canace</i>		<i>Venessa canace</i>
84	Great Eggfly	Nymphalidae	<i>Hypolimnas bolina</i>		<i>Hypolimnas bolina</i>
85	Danaid Eggfly	Nymphalidae	<i>Hypolimnas misippus</i>		<i>Hypolimnas misippus</i>
86	South Indian Blue Oakleaf	Nymphalidae	<i>Kallima horsfieldi</i>	1	<i>Kallima philarchus</i>
87	Glassy Tiger	Nymphalidae	<i>Parantica aglea</i>		<i>Danais aglea</i>
88	Nilgiri Tiger	Nymphalidae	<i>Parantica nilgiriensis</i>	1	<i>Danais nilgiriensis</i>
89	Blue Tiger	Nymphalidae	<i>Tirumala limniace</i>		<i>Danais limniace</i>
90	Dark Blue Tiger	Nymphalidae	<i>Tirumala septentrionis</i>		<i>Danais melissa</i>
91	Plain Tiger	Nymphalidae	<i>Danaus chrysippus</i>		<i>Danais chrysippus</i>
92	Striped Or Common Tiger	Nymphalidae	<i>Danaus genutia</i>		<i>Danais plexippus</i>
93	Common Indian Crow	Nymphalidae	<i>Euploea core</i>		<i>Euploea core</i>
94	Double-Branded Crow	Nymphalidae	<i>Euploea sylvester</i>		<i>Euploea coreta</i>
95	Malabar Tree Nymph	Nymphalidae	<i>Idea malabarica</i>	1	<i>Hestia lynceus</i>
96	Plum Judy	Lycaenidae	<i>Abisara echerius</i>		<i>Abisara echerius</i>
97	Common Pierrot	Lycaenidae	<i>Castalius rosimon</i>		<i>Castalius rosimon</i>
98	Angled Pierrot	Lycaenidae	<i>Caleta caleta</i>		<i>Castalius caleta</i>
99	Banded Blue Pierrot	Lycaenidae	<i>Discolampa ethion</i>		<i>Castalius ethion</i>
100	Zebra Blue	Lycaenidae	<i>Leptotes plinius</i>		<i>Syntarucus plinius</i>
101	Common Hedge Blue	Lycaenidae	<i>Actolepis puspa</i>		<i>Lycaenopsis puspa</i>
102	Whitedisc Hedge Blue	Lycaenidae	<i>Celatoxia albidisca</i>	1	<i>Lycaenopsis albidisca</i>
103	Plain Hedge Blue	Lycaenidae	<i>Celestrina lewendularis</i>		<i>Lycaenopsis lewendularis</i>
104	Malayan	Lycaenidae	<i>Magisba malaya</i>		<i>Magisba malaya</i>
105	Lesser Grass Blue	Lycaenidae	<i>Zizina otis</i>		<i>Zizeeria otis</i>
106	Tiny Grass Blue	Lycaenidae	<i>Zizula hylax</i>		<i>Zizeeria gaika</i>
107	Grass Jewel	Lycaenidae	<i>Freyeria trochylus</i>		<i>Zizeeria trochylus</i>
108	Gram Blue	Lycaenidae	<i>Euchrysops cnejus</i>		<i>Euchrysops cnejus</i>
109	Forget-Me-Not	Lycaenidae	<i>Catochrysops strabo</i>		<i>Catochrysops strabo</i>
110	Pea Blue	Lycaenidae	<i>Lampides boeticus</i>		<i>Lampides boeticus</i>
111	Dark Cerulean	Lycaenidae	<i>Jamides bochus</i>		<i>Jamides bochus</i>
112	Common Cerulean	Lycaenidae	<i>Jamides celeno</i>		<i>Jamides celeno</i>
113	Metallic Cerulean	Lycaenidae	<i>Jamides alecto</i>		<i>Jamides alecto</i>
114	Large 4-Line Blue	Lycaenidae	<i>Nacaduba pactolus</i>		<i>Nacaduba pactolus</i>
115	Red Pierrot	Lycaenidae	<i>Talicauda nyseus</i>		<i>Talicauda nyseus</i>
116	Tamil Oakblue	Lycaenidae	<i>Arhopala bazaloides</i>	2	<i>Amblypodia abseus</i>
117	Leaf Blue	Lycaenidae	<i>Amblypodia anita</i>		<i>Horsefieldia anita</i>
118	Common Silverline	Lycaenidae	<i>Spindasis vulcanus</i>		<i>Spindasis vulcanus</i>

S. NO.	COMMON NAME	FAMILY	CUR. LATIN NAME	END	OLD LATIN NAME
119	Yamfly	Lycaenidae	<i>Loxura atymnus</i>		<i>Loxura atymnus</i>
120	Common Imperial	Lycaenidae	<i>Cheritra freja</i>		<i>Cheritra freja</i>
121	Monkey Puzzle	Lycaenidae	<i>Rathinda amor</i>		<i>Rathinda amor</i>
122	White Royal	Lycaenidae	<i>Pratapa deva</i>		<i>Pratapa deva</i>
123	Banded Royal	Lycaenidae	<i>Rachana jalindra</i>		<i>Charana jalindra</i>
124	Fluffy Tit	Lycaenidae	<i>Zeltus amasa</i>		<i>Zeltus etolus</i>
125	Large Guava Blue	Lycaenidae	<i>Deudorix perse</i>		<i>Virachola perse</i>
126	Slate Flash	Lycaenidae	<i>Rapala manea</i>		<i>Rapala schistacea</i>
127	Indigo Flash	Lycaenidae	<i>Rapala varuna</i>		<i>Rapala varuna</i>
128	Common Banded Awl	Hesperidae	<i>Hasora chromus</i>		<i>Hasora alexis</i>
129	Common Awl	Hesperidae	<i>Hasora badra</i>		<i>Hasora badra</i>
130	Brown Awl	Hesperidae	<i>Badamia exclamationis</i>		<i>Badamia exclamationis</i>
131	Indian Awlking	Hesperidae	<i>Choaspes benjaminii</i>		<i>Choaspes benjaminii</i>
132	Water Snow Flat	Hesperidae	<i>Tagiades litigiosa</i>		<i>Tagiades litigiosa</i>
133	Fulvous Pied Flat	Hesperidae	<i>Pseudocoladenia dan</i>		<i>Coladenia dan</i>
134	Common Small Flat	Hesperidae	<i>Sarangesa dasahara</i>		<i>Sarangesa dasahara</i>
135	Golden Angle	Hesperidae	<i>Odontoptilum ransonnetti</i>		<i>Caprona ransonnetti</i>
136	Indian Grizzled/Indian Skipper	Hesperidae	<i>Spialia galba</i>		<i>Syrichtus galba</i>
137	Coon	Hesperidae	<i>Psolos fuligo</i>		<i>Sancus pulligo</i>
138	Common Banded Demon	Hesperidae	<i>Notocrypta paralysos</i>		<i>Notocrypta paralysos</i>
139	Grass Demon	Hesperidae	<i>Udaspes folus</i>		<i>Udaspes folus</i>
140	Tamil Dartlet	Hesperidae	<i>Oriens concinna</i>	1	<i>Oriens concinna</i>
141	Indian/Common Dartlet	Hesperidae	<i>Oriens goloides</i>		<i>Oriens gola</i>
142	Dark Palm Dart	Hesperidae	<i>Telicota ancilla</i>		<i>Astychus pythias</i>
143	Conjoint swift	Hesperidae	<i>Pelopidas conjuncta</i>		<i>Baoris conjuncta</i>

End. = Endemic 1= Endemic to Western Ghats, 2 = Endemic to both Ceylon and Western Ghats

Appendix - 3.2 LIST OF FISHES IN ACA

S. NO.	LATIN NAME	END/NE	FAMILY	HABIT
1	<i>Cyprinus carpio communis</i> Linn.	Ex	Cyprinidae	Omnivore, Gregarious
2	<i>Gonoproctopterus curmuca</i> Hamilton Buchnan	EN	Cyprinidae	Omni. Bott. feeder, Algi & insects
3	<i>Puntius carnaticus</i> Jerdon	EN	Cyprinidae	Omnivore
4	<i>Puntius filamentoses</i> Valenciennes	NE	Cyprinidae	Omnivore
5	<i>Puntius melanampyx</i> Day	EN	Cyprinidae	Omnivore
6	<i>Tor khudree</i> Sykes	NE	Cyprinidae	Carnivore On sall fishes
7	<i>Salmostoma boopis</i> Day	EN	Cyprinidae	Omnivore, Surface feeder Plankt.
8	<i>Barilius bakeri</i> Day	EN	Cyprinidae	Omni. Col. feeder Plankt. & Lar.
9	<i>Barilius gatensis</i> Valenciennes	EN	Cyprinidae	Omni. Col. feeder Plankt. & Lar.
10	<i>Danio aequipinnatus</i> McClelland	NE	Cyprinidae	Omni. Col. feeder Plankt. & Lar.
11	<i>Danio malabaricus</i> Hamilton Buchnan	EN	Cyprinidae	Omni. Col. feeder Plankt. & Lar.
12	<i>Parluciosoma daniconius</i>	NE	Cyprinidae	Omni. Col. feeder Plankt. & Lar.
13	<i>Garra mcellandi</i>	EN	Cyprinidae	Algivore, Bottom feeder
14	<i>Garra mullya</i>	NE	Cyprinidae	Algivore, Bottom feeder
15	<i>Bhavanaia australis</i>	EN	Balitoridae	Algivore, Bottom feeder
16	<i>Noemachilus guentheri</i>	EN	Balitoridae	Detritivore Bottom feeder
17	<i>Noemachilus triangularis</i>	EN	Balitoridae	Detritivore Bottom feeder
18	<i>Lepidocephalicthys thermalis</i>	EN	Cobitidae	Detritivore Bottom feeder
19	<i>Mystus armatus</i>	EN	Bagridae	Carnivore column feeder
20	<i>Mystus malabaricus</i>	EN	Bagridae	Carnivore column feeder
21	<i>Mystus oculus</i>	EN	Bagridae	Carnivore column feeder
22	<i>Salmo gairdnerii gairdnerii</i>	Ex	Salmonidae	Anadromous
23	<i>Aplochilus lineatus</i>	EN	Aplocheilidae	Carnivore, Surface feeder Larvivore
24	<i>Pristolepis marginata</i>	EN	Nandidae	carnivore, Column feeder
25	<i>Etroplus maculatus</i>	EN	Cichlidae	omnivore, Column feeder
26	<i>Oreochromis mossambica</i>	Ex	Cichlidae	omnivore, Column feeder
27	<i>Glossogobius giurus</i>	NE	Gobiidae	Omnivore bottom dwelling
28	<i>Mastacembelus armatus</i>	NE	Mastacembelidae	Omnivore, Bottom feeder

Appendix - 3.3 LIST OF AMPHIBIANS IN ACA

S. No.	LATIN NAME	COMMON NAME	IUCN	END	HABIT	HABITAT
	FAMILY BUFONIDAE					
1	<i>Bufo beddomei</i> Gunther, 1875	Beddome's toad	LRnT	E	Terrestrial	EG, Agricultural fields and planatation
2	<i>Bufo fergusonii</i> Boulenger, 1892	Ferguson's taod	LRnT	NE	Burrowing, Nocturnal terrestrial	EG
3	<i>Bufo melanostictus</i> Schneider, 1799	Common asian toad	LRnT	NE	Terrestrial,	All Habitats
4	<i>Bufo microtympnum</i> Boulenger, 1882	Small eared frog	LRnT	NE	Hilly areas/terrestrial	EG
5	<i>Bufo stomatichus stomatichus</i> Lutken, 1862	Marbled toad	LRnT	NE	Terrestrial	All Habitats
	FAMILY RANIDAE					
6	<i>Euphlyctis cyanophlyctis</i> Schneider, 1799	Indian skipping forg	LRnT	NE	Aquatic	All habitats
7	<i>Euphlyctis hexadactylus</i> Lesson, 1834	Indian green frog	LRnT	NE	Aquatic	All habitats
8	<i>Hoplobatrachus crassus</i> Jerdon, 1853	Jerdon's Bullfrog	LRnT	NE	Burrows	EG & MD
9	<i>Hoplobatrachus tigrerinus</i> Daudin 1803	Indian Bullfrog	V	NE	Semi aquatic/Omnivorous	MD
10	<i>Indirana beddomei</i> Gunther 1875	Beddome's frog	V	E	Terrestrial/Mois t/Litter-rich soil	MD and SEG
11	<i>Indirana brachytarsus</i> Gunther 1875	Leaf hopper frog	V	E	Terrestrial Forestfloor below litter	EG
12	<i>Indirana diplostictus</i> Gunther 1875	Rufous leaf hopper frog	V	E	Near Hill streams seepage floors	EG
13	<i>Indirana leptodactyla</i> Boulenger 1882	Long toed frog	V	E	Leaf litter of moist forest floor	EG, MDand SEG
14	<i>Indirana lethii</i> Boulenger 1888	Leith's frog	LRnT	E	Semi aquatic to terrestrial	EG and Riparian forest
15	<i>Indirana semipalmata</i> Boulenger 1882	Small handed frog	V	E	Terrestrial, forest	EG & MD
16	<i>Limnonectes brevipalmata</i> Peters 1871	Short webbed frog	LRnT	E	Leaf litter, temporary pools forest floor	EG
17	<i>Limnonectes keralensis</i> Dubois 1980	Kerla warty frog	LRnT	E	Semi aquatic	EG

S. No.	LATIN NAME	COMMON NAME	IUCN	END	HABIT	HABITAT
18	<i>Limnonectes limnocharis</i> Boi in : Wiegmann 1835	Cricket frog	LRnT	NE	Semi aquatic	EG and Cofee and Tea Plantation
19	<i>Melanobatrachus indicus</i> Beddome 1878	NIL	V	E	Terrestrial Wet grasses,	Disturbed areas, bath rooms, habitation and Secondary forest
20	<i>Micrixalus fuscus</i> Boulenger 1882	Dusky torrent toad	LRnT	E	Stream dwelling	EG
21	<i>Micrixalus gadgili</i> Pillai & Pattabiraman 1991	Gadgill's torrent toad	EN	E	Leaf litter, decomposing forest floor	EG and Tea Estate
22	<i>Nyctibatrachus aliciae</i> Inger, Shaffer, Koshi & Bakde 1984	Grandison's wrinkled frog	V	E	Semi Aquatic Under small stones and boulders	EG, SEG , MD & DD
23	<i>Nyctibatrachus beddomii</i> Boulenger 1882	Pigmy wrinkled frog	LRnT	E	Leaf litter	EG & MD
24	<i>Nyctibatrachus deccanensis</i> Dubois 1984	Deccan wrinkled frog	V	E	Semi aquatic, Marshy area	EG
25	<i>Nyctibatrachus major</i> Boulenger 1882	Large wrinkled frog	LRnT	E	Hill stream, Torrential/aquatic	EG & MD
26	<i>Rana curtipes</i> Jerdon 1853	Bicoloured frog	LRnT	E	Forest floor, litter	Scrub Disturbed areas, planation and GEN, Water edges in forest, plains, paddy fields
27	<i>Rana temporalis</i> Gunther 1864	Bronzed frog				
28	<i>Tomopterna rolandae</i> Dubois 1983	Roland's burrowing frog	LRnT	NE	Fossorial	Sandy soil
29	<i>Tomopterna parambikulamana</i>	NIL	DD	E	Fossorial	Sandy soil
FAMILY RHACOPHORIDAE						
30	<i>Philautus beddomii</i> Gunther 1875	Beddome's bush frog	V	E	Litter moist	EG
31	<i>Philautus chalazodes</i> Gunther 1875	White spotted bush frog	V	E	Litter moist, under stones	EG
32	<i>Philautus charius</i> Rao 1937	Seshachar's bush frog	LRnT	E	Semi arboreal	Scrub forest near human settlement
33	<i>Philautus glandulosus</i> Jerdon 1853	Rough skinned bush frog	V	E	Semi-aquatic?, Near by stagnant water bodies	GEN
34	<i>Philautus pulcherimus</i> Ahl1927	Beautiful bush frog	V	E	Litter moist, under stones, bark of trees	MD & DD

S. No.	LATIN NAME	COMMON NAME	IUCN	END	HABIT	HABITAT
35	<i>Philautus signatus</i> Boulenger 1882	Quartet bush frog	V	E	Leaf litter, Near hill streams and under stones	Scrub near Human habitation, Plains
36	<i>Philautus variabilis</i> Gunther 1868	Variable bush frog	LRnT	NE	Arboreal Aviary from water/ on ground water and on shrubs	GEN, All kinds of water bodies
37	<i>Philautus nasutus</i> Gunther 1868	NIL	LRnT	E	Arboreal	EG
38	<i>Polypedates cruciger</i>	NIL	V	E	Shrubs/herbsStream sides	EG & MD
39	<i>Polypedates maculatus maculatus</i> Gray 1834	Indian tree frog	LRnT	NE	Arboreal	GEN Permanent water bodies in
40	<i>Rhacophorus pleurostictus</i> Gunther 1864	Zamorin tree frog	V	E	Arboreal	Dry Primary and Secondary forest
FAMILY MICROHYALIDAE						
41	<i>Uperodon systoma</i> Schneider 1799	Marbled Balloon frog	LRnT	NE	Fossorial	GEN Forest and human habitation
42	<i>Kaloula taprobanica</i> Parker 1934	Srilankan Bullfrog	LRnT	NE	Arboreal	EG
43	<i>Microhyla rubra</i> Jerdon 1854	Red narrow mouthed frog	LRnT	NE	Fossorial	EG & MD
44	<i>Ramanella montana</i> Jerdon 1854	Jerdon's Ramanella	LRnT	E	Fossorial	GEN, Temp. or perm. water bodies
45	<i>Ramanella variegata</i> Stoliczka 1872	Varigated Ramanella	LRnT	NE	Fossorial	Inundated areas particularly edges
FAMILY ICTHYOPHIDAE						
46	<i>Ichthyophis subterrestris</i> Taylor 1960	Semi-terrestrial caecilian	V	E	Subterranean	EG and Tea Estate
47	<i>Ichthyophis tricolor</i> Annandale 1909	Three coloured caecilian	EN	E	Subterranean	EG & MD

Appendix- 3.4 LIST OF REPTILES OF ACA

S. No.	LATIN NAME	COMMON NAME	EN/NE	IUCN	HABIT	HABITAT
FAMILY AGAMIDAE						
1	<i>Salea anamallayana</i> Bedd 1878	Anamalai salea	En	EN	Arboreal	Shola grassland
2	<i>Calotes ellioti</i> Gunther 1864	Elliot's calotes	En	LRnt	Arboreal	EG
3	<i>Draco dussumieri</i> Dum & Bib 1837	Flying lizard	En	LRnt	Arboreal	DD to MD, EG
4	<i>Calotes rouxi</i> Dum & Bib 1837	Forest calotes	En	LRnt	Arboreal	DD to MD, EG
5	<i>Calotes versicolor</i> Daudin 1802	Garden lizard	NE	LRnt	Arboreal	GEN, All secondary forests upto MD
6	<i>Calotes calotes</i> Linn 1758	Green calotes	NE	LRnt	Arboreal	DD to EG
7	<i>Calotes nemoricola</i> Jerdon 1853	Nilgiri forest Lizard	En	Vul	Arboreal	EG, MD
8	<i>Psammophilus dorsalis</i> Gray 1831	Rock lizard	NE	LRnt	Terrestrial, Rocky areas	GEN, All
FAMILY BATAGURIDAE						
9	<i>Geoemyda silvatica</i> Henderson 1912	Cochin Forest cane turtle	En	Vul	Terrestrial, Forest floor, Crepuscular,	EG
10	<i>Melanochelys trijuga trijuga</i> Schweigger 1812	Pond turtle	En	LRlc	Aquatic, Stagnant waters	GEN, Fr. water ponds, reservoirs, paddy fields
FAMILY BOIDAE						
11	<i>Eryx conicus</i> Schneider 1801	Common sand boa	NE	LRnt	Terrestrial,	GEN, All types of habitats
12	<i>Python molurus</i> Linn 1758	Indian python	NE	LRnt	Arboreal	GEN, All, Arid, Semi Arid, DD, MD, SEG, EG
FAMILY CHAMAELEONIDAE						
13	<i>Chamaeleo zeylanicus</i> Laurenti 1768	Chameleon	NE	Vul	Arboreal	EG, MD
FAMILY COLUBRIDAE						
14	<i>Amphiesma stolata</i> Linn 1759	Buffstriped keelback	NE	LRnt	Terrestrial, Semi aquatic	
15	<i>Dendrelaphis tristis</i> Daudin 1803	Common bronze backed tree sanke	NE	LRlc	Arboreal	Scrub to MD commensal
16	<i>Ahaetulla perroteti</i> Bib & Dum 1854	Common green whip snake	En	EN	Arboreal	EG
17	<i>Oligodon arnensis</i> Shaw 1802	Common kukri	NE	LRlc	Terrestrial	Scrub to MD
18	<i>Lycodon aulicus</i> Linn 1758	Common wolf snake	NE	LRlc	Terrestrial	Scrub to MD

S. No.	LATIN NAME	COMMON NAME	EN/NE	IUCN	HABIT	HABITAT
19	<i>Macropisthodon plumbicolor</i> Cantor 1839	Green keel backed snake	NE	LRnt	Terrestrial, Diurnal	DFs, Deciduous forests
20	<i>Atretium shistosum</i>	Olivaceous keelback water snake	NK	NK	Aquatic	
21	<i>Ptyas mucosus</i> Linn 1758	Rat snake	NE	LRlc	Terrestrial, Semi aquatic,	GEN, Semi desert to EG
					Semi arboreal	
22	<i>Elaphe helena</i> Schulz 1992	Trincket snake	NE	Vul	Arboreal Semi,	DD, MD, EG
	Family Crocodylidae					
23	<i>Crocodylus palustris</i> Lesson 1831	Marsh crocodile	NE	Vul	Semi-aquatic Nocturnal,	GEN River swamps & marshes
	Family Elaphidae				Carnivorous	
24	<i>Bangarus caeruleus</i> Schneider 1801	Common krait	NE	LRnt	Terrestrial, Nocturnal	SEC, scrub, secondary human habitation
25	<i>Naja naja</i> Linn 1758	Indian cobra	NE	LRnt	Terrestrial, Diurnal	GEN, All types of habitats
26	<i>Ophiophagus hannah</i> Cantor 1836	King cobra	NE	LRnt	Terrestrial,	EG, MD & Mangrove
	FAMILY GECKONIDAE					
26	<i>Hemi dactylus anamallensis</i> Gunther 1874	Anaimalai geko	En	Vul	Terrestrial	EG
27	<i>Hemidactylus frenatus</i> Dum & Bib 1836	Asian House gecko	NE	LRlc	Terrestrial, Nocturnal	SEC Affinity to human inhabitation, Houses, crevices,
28	<i>Hemidactylus brookii</i> Gray 1845	Brook's gecko	NE	LRlc	Terrestrial, arboreal	GEN, All terrain, Human commensal
29	<i>Cnemaspis jerdonii</i> Theobald 1868	Dwarf gecko	En	Vul	NK	NK
30	<i>Hemidactylus maculatus</i> Dum. & Bib. 1836	Northern spotted gecko	En	LRlc	Terrestrial, Rocks & caves	Scrub, DD, MD
	Family Scincidae					
31	<i>Mabuya beddomii</i> Jerdon 1870	Beddom's skink	NE	LRlc	NK	NK
32	<i>Mabuya carinata</i> Schneider 1801	Common keeled grass skink	NE	LRnt	Terrestrial, Diurnal	GEN, All commensal to human
	FAMILY TESTUDINIDAE					
33	<i>Indotestudo forstenii</i>	Trvancore tortoise	En	LRnt	Terrestrial,	MD, SEG, EG

S. No.	LATIN NAME	COMMON NAME	EN/NE	IUCN	HABIT	HABITAT
	Schlegel & Muller 1844				Forest floor, crevices, Fallen trees	Rubber plantations
	FAMILY TYPHLOPIDAE					
34	<i>Typhlops beedomii</i> Boul 1890	Beddome's Wormsnake	En	Vul	Fossorial	DFs.
35	<i>Ramphotyphlops braminus</i> Daudin 1803	Common worm snake	NE	LRnt	Fossorial	General, All types of habitats
	Family Uropeltidae					
36	<i>Uropeltis ocellatus</i> Bedd 1863	Ocellate shield tailed snake	En	LRlc	Fossorial	SEC, EG, Secondary, Tea, coffee, & other plantation
	Family Varanidae					
37	<i>Varanus bengalensis</i> Daudin 1802	Common monitor	NE	Vul	Terrestrial,	SEC, DD, Paddy field, commensal
	FAMILY VIPERIDAE					
38	<i>Trimeresurus gramineus</i> Shaw 1802	Green or Bamboo pit viper	NE	LRnt	Terrestrial, arboreal, nocturnal	GEN, All types of habitats
39	<i>Hypnale hypnale</i> Merrem 1820	Indian Hump nosed pit viper	NE	LRnt	Terrestrial	MD & EG Tree buttresses, mossy banks
40	<i>Trimeresurus macrolepis</i>	Large scaled pit viper	NK	NK	NK	
41	<i>Daboia russelli</i> Shaw & Nodder 1797	Russel's viper	NE	LRnt	Terrestrial, Nocturnal	GEN, Bushy areas,
42	<i>Echis carinata</i> Sochurek Stemmler, 1969	Saw scaled viper	NE	LRnt	Terrestrial, Diurnal	Scrub to DD
43	<i>Riopa punctata</i>	Snake skink	NK	NK	Terrestrial	

Appendix 3.5 LIST OF BIRDS IN ACA

S. NO	SYNO	LATIN NAME	COMMON NAME	HABITAT	CAT.	END.
		FAMILY ACCIPITRIDAE				
1	124	<i>Elanus caeruleus</i>	Black Winged Kite	SCRUB		0
2	127	<i>Aviceda leucophotes</i>	Black Crested Baza	EG		0
3	130	<i>Pernis ptilorhyncus</i>	Honey Buzzard	DD,SEG		0
4	133	<i>Milvus migrans</i>	Pariah Kite	GEN		0
5	135	<i>Haliastur indus</i>	Brahmini Kite	GEN,WATER		0
6	139	<i>Accipter badius</i>	Shikra	DD,MD		0
7	144	<i>Accipter trivirgatus</i>	Crested Goshawk	EG		0
8	147	<i>Accipter nisus</i>	Sparrow Hawk	EG		0
9	151	<i>Accipter virgatus besra</i>	Besra Sparrow Hawk	EG,MD		0
10	153	<i>Buteo rufinus</i>	Long legged Buzzard	DD		0
11	156	<i>Buteo buteo japonicus</i>	Japanese Buzzard	GL		0
12	157	<i>Butastur teesa</i>	White eyed buzzard Eagle			0
13	158	<i>Spizaetus nipalensis</i>	Hodgson's Hawk Eagle	EG,DD		0
14	161	<i>Spizateus cirrhatus</i>	Crested Hawk Eagle	DD,SEG		0
15	163	<i>Hieraaetus fasciatus</i>	Bonnellis Eagle	DD,MD,SEG,EG		0
16	164	<i>Hieraaetus pennatus</i>	Booted Hawk Eagle	DD,MD,SEG,EG		0
17	165	<i>Hieraaetus kienerii</i>	Rufousbellied eagle	EG		0
18	172	<i>Ictinaetus malayensis</i>	Black Eagle	EG,MD		0
19	175	<i>Ichthyophaga ichthyaetus</i>	Greyheaded Fishing Eagle	RIVERINE		0
20	195	<i>Circaetus gallicus</i>	Short-toed Eagle	SCRUB		0
21	196	<i>Spilornis cheela</i>	Crested Serpent Eagle	EG,DD		0
22	203	<i>Pandion haliaetus</i>	Osprey	DD,MD		0
23	209	<i>Falco perigrinus japonensis</i>	Peregrine Falcon	GEN		0
24	719	<i>Ceryle rudis</i>	Lesser Pied Kingfisher	GEN		0
25	722	<i>Alcedo atthis</i>	Common Kingfisher	GEN		0
26	730	<i>Pelargopsis capensis</i>	Strokbilled Kingfisher	GEN		0
27	735	<i>Halcyon smyrnesis</i>	Whitebreasted Kingfisher	GEN		0
28	739	<i>Halcyon pileata</i>	Blackcapped Kingfisher			0
		FAMILY ALUDIDAE				
29	873	<i>Mirafra assamica</i>	Bush Lark	GL		0
30	901	<i>Galerida malabarica</i>	Malabar Crested Lark	GL		1
31	907	<i>Aluda gulgula</i>	Eastern Sky Lark	GL		0
		FAMILY ANATIDAE				

S. NO	SYNO	LATIN NAME	COMMON NAME	HABITAT	CAT.	END.
32	105	<i>Anas clypeata</i>	Shoveller	GEN,WATER		0
		FAMILY APODIDAE				
33	685	<i>Collocalia unicolor</i>	Indian Edible-Nest Swiftlet	GEN		3
34	691	<i>Chaetura gigantea</i>	Large Brownthroated Spinetail Swift	EG		0
35	692	<i>Chaetura sylvatica</i>	Whiterumped Spintail	EG,MD		2
36	693	<i>Apus melba</i>	Alpine Swift	DD,MD		0
37	703	<i>Apus affinis</i>	House Swift	GEN		0
38	707	<i>Cypsiurus parvus</i>	Palm Swift	GEN		0
39	709	<i>Hemiprocne longipennis</i>	Crested Tree Swift	SEG, MD,DD		0
		FAMILY ARDEIDAE				
38	38	<i>Ardeola striatus</i>	Little Green Heron	GEN		0
39	42	<i>Ardeola grayii</i>	Pond Heron	GEN		0
40	44	<i>Bubulcus ibis</i>	Cattle Egret	GEN		0
41	47	<i>Egretta intermedia</i>	Median Egret	GEN		0
42	49	<i>Egretta garzetta</i>	Little Egret	GEN		0
		FAMILY BUCEROTIDAE				
43	768	<i>Tockus griseus</i>	Malabar Grey Hornbill	EG,MD,DD	N	3
44	775	<i>Anthracoceros coronatus</i>	Malabar Pied Hornbill	EG,MD	N	4
45	776	<i>Buceros bicornis</i>	Great Pied Hornbill	EG,MD	EN	0
		FAMILY CAMPEPHAGIDAE				
46	1065	<i>Hemipus pictatus</i>	Pied-flycatcher Shrike	EG,MD,DD		0
47	1068	<i>Tephrodornis virgatus</i>	Large Wood Shrike	GEN		0
48	1070	<i>Tephrodornis pondicerianus</i>	Common Wood Shrike	DD,MD		0
49	1072	<i>Coracina novaehollandiae</i>	Large Cuckoo Shrike	SEG, MD,DD		0
50	1081	<i>Pericrocotus flammeus</i>	Scarlet Minivet	EG,MD,DD		0
60	1093	<i>Pericrocotus cinnamomeus</i>	Small Minivet	SEG,DD,MD		0
		FAMILY CAPITONIDAE				
61	782	<i>Megalaima zeylanica</i>	Large Green Barbet	EG,MD,DD		2
62	785	<i>Megalaima viridis</i>	Small Green Barbet	GEN		1
63	791	<i>Megalaima rubricapilla</i>	Crimsonthroated Barbet	EG		3
64	792	<i>Megalaima haemacephala</i>	Crimsonbreasted Barbet	GEN		0
		FAMILY CAPRIMUGILIDAE				
65	669	<i>Eurostopodus macrotis</i>	Great Eared Nightjar	EG,MD		3
66	671	<i>Caprimulgus indicus</i>	Indian Jungle Nightjar	DD,MD,SEG		0
67	675	<i>Caprimulgus macrurus</i>	Longtailed Nightjar	GEN		0

S. NO	SYNO	LATIN NAME	COMMON NAME	HABITAT	CAT.	END.
68	680	<i>Caprimulgus asiaticus</i>	Common Indian Nightjar	GEN		0
		FAMILY CHARARDIDAE				
69	366	<i>Vanellus indicus</i>	Redwattled Lapwing	GEN		0
70	397	<i>Tringa ochropus</i>	Green Sandpiper	GEN		0
71	398	<i>Tringa glareola</i>	Wood sandpiper			0
72	401	<i>Tringa hypoleucos</i>	Common Sandpiper	GEN		0
73	404	<i>Gallinago spp.</i>	Snipe Sp.	GEN		0
		FAMILY COLUMBIDAE				
74	496	<i>Treron pompadora</i>	Greyfronted Green Pigeon	DD,MD,SEG		0
75	501	<i>Treron bicincta</i>	Orange Breasted Green Pigeon(?)	GEN		0
76	503	<i>Treron phoenicoptera</i>	Yellolegged Green Pigeon	DD,MD,SEG		0
77	506	<i>Dacula aenea</i>	Green Imperial Pigeon	DD,MD,SEG		0
78	510	<i>Dacula badia</i>	Jerdon's Imperial Pigeon	EG		0
79	516	<i>Columba livia</i>	Blue Rock Pigeon	GEN		0
80	521	<i>Columba elphinstonii</i>	Nilgiri Wood Pigeon	SHOLA	N	1
81	537	<i>Streptopelia chiensis</i>	Spotted Dove	DD,MD,SEG		0
82	542	<i>Chalcophaps indica</i>	Emerald Dove	GEN		0
		FAMILY CORACIIDAE				
83	755	<i>Coracias benghalensis</i>	Indian Roller	GEN		0
84	759	<i>Eurystomus orientalis</i>	Broadbilled Roller	EG		0
		FAMILY CORVIDAE				
85	1032	<i>Dendrocitta vagabunda</i>	Indian Tree Pie	GEN		0
86	1036	<i>Dendrocitta leucogastra</i>	Whitebellied Tree Pie	EG,MD		6
87	1049	<i>Corvus splendens</i>	House Crow	GEN		0
88	1054	<i>Corvus macrorhynchos</i>	Jungle Crow	GEN		0
		FAMILY CUCULIDAE				
89	569	<i>Clamator coromandus</i>	Redwinged Crested Cuckoo	EG,MD		0
90	572	<i>Cuculus sparverioides</i>	Large Hawk Cuckoo	MD		0
91	573	<i>Cuculus varius</i>	Common Hawk Cuckoo	GEN		0
92	576	<i>Cuculus micropterus</i>	Indian Cuckoo	GEN		0
93	582	<i>Cacomantis sonneratii</i>	Banded Bay Cuckoo	DD,SEG,MD		0
94	584	<i>Cacomantis passerinus</i>	Plaintive Cuckoo	DD		0
95	588	<i>Surinicus lugubris</i>	Drongo Cuckoo	GEN		0
96	590	<i>Eudynamys scolopacea</i>	Koel	GEN		0
97	595	<i>Rhodopodytes viridrostris</i>	Small Greenbilled Malkoha	DD		0

S. NO	SYNO	LATIN NAME	COMMON NAME	HABITAT	CAT.	END.
98	598	<i>Taccocua leschenaultii</i>	Sirkeer Cuckoo	DD		0
99	600	<i>Centropus sinensis</i>	Coucal	GEN		0
100	605	<i>Cnetropus toulou</i>	Lesser Coucal	DD,MD,SEG		0
		FAMILY DICRURIDAE				
101	963	<i>Dicrurus adsimilis</i>	Black Drongo	GEN		0
102	965	<i>Dicrurus leucophaeus</i>	Grey Drongo	GEN		0
103	967	<i>Dicrurus caerulescens</i>	Whitebellied Drongo	GEN		5
104	971	<i>Dicrurus aeneus</i>	Bronze Drongo	EG,MD,DD		0
105	973	<i>Dicrurus hottentottus</i>	Hair Crested Drongo	EG,MD,		0
106	977	<i>Dicrurus paradiseus</i>	Greater Racket-tailed Drongo	GEN		0
		FAMILY FALCONIDAE				
107	211	<i>Falco peregrinus peregrinator</i>	Shaheen Falcon	GEN	EN	0
108	212	<i>Falco subbuteo</i>	Hobby (?)	NIL		0
109	215	<i>Falco severus</i>	Oriental Hobby	NIL		0
110	222	<i>Falco tinnunculus</i>	Kestrel	GL		0
		FAMILY FRINGILLIDAE				
111	2013	<i>Caprodacus erythrinus</i>	Common Rosefinch	EG,		0
		FAMILY HIRUNDINIIDAE				
112	914	<i>Hirundo concolor</i>	Dusky Crag Martin	GL		0
113	916	<i>Hirundo rustica</i>	Swallow	GEN		0
114	919	<i>Hirundo tahitica</i>	House Swallow	GL		0
115	923	<i>Hirundo daurica</i>	Redrumped Swallow	GEN		0
		FAMILY IRENIDAE				
116	1098	<i>Aegithina tiphia</i>	Common Iora	GEN		0
117	1103	<i>Chloropsis aurifrons</i>	Goldenfronted Chloropsis	GEN		0
118	1108	<i>Chloropsis cochinchinensis</i>	Goldenmantled Chloropsis	SCRUB		0
119	1109	<i>Irena puella</i>	Fairy bluebird	EG,MD		0
		FAMILY LANIDAE				
120	946	<i>Lanius schach</i>	Rufous-backed Shrike	DD		0
121	949	<i>Lanius cristatus</i>	Brown Shrike	EG,MD		0
		FAMILY LARIDAE				
123	463	<i>Sterna aurantia</i>	Indian River Tern	LAKE		0
124	464	<i>Sterna hirundo</i>	Common Tern	LAKE		0
		FAMILY MEROPIDAE				
125	744	<i>Merops leschenaulti</i>	Chestnut headed Bee-eater	DD,MD,SEG		0
126	748	<i>Merops philippinus</i>	Blue-tailed Bee-eater	GEN		0

S. NO	SYNO	LATIN NAME	COMMON NAME	HABITAT	CAT.	END.
127	750	<i>Merops orientalis</i>	Small Green Bee-eater	GEN		0
128	753	<i>Nyctornis atherotoni</i>	Blue-bearded Bee-eater	DD,MD		0
		FAMILY MOTTACILLIDAE				
129	1852	<i>Anthus hodgsoni</i>	Indian Tree Pipit	EG		0
130	1854	<i>Anthus trivialis</i>	Tree Pipit	EG		0
131	1858	<i>Anthus novaeselandiae</i>	Paddyfield Pipit	GEN		0
132	1868	<i>Anthus similis</i>	Brown Rock Pipit			0
133	1870	<i>Anthus nilghiriensis</i>	Nilgiri Pipit	GL		1
134	1874	<i>Motacilla indica</i>	Forest Wagtail	MD,EG		0
135	1883	<i>Motacilla citreola</i>	Yellowheaded Wagtail	GEN		0
136	1884	<i>Motacilla cinerea</i>	Grey Wagtail	GEN		0
137	1891	<i>Motacilla maderaspatensis</i>	Large Pied Wagtail	GEN		5
		FAMILY MUSCICAPIDAE				
138	1145	<i>Pellorneum ruficeps</i>	Spotted Babbler	SHOLA		0
139	1173	<i>Pomatorhinus horsfieldii</i>	Slatyheaded Scimitar Babbler	EG,MD		0
140	1222	<i>Dumetia hyperythra</i>	Rufousbellied Babbler	DD		0
141	1224	<i>Rhopocichla atriceps</i>	Blackheaded babbler	EG		3
142	1259	<i>Turdoides subrufus</i>	Rufous Babbler	EG,MD		1
143	1265	<i>Turdoides striatus</i>	Jungle Babbler	DD		2
144	1267	<i>Turdoides affinis</i>	Whiteheaded Babbler	GEN		0
145	1287	<i>Garrulax delesserti</i>	Wynad Laughing Thrush	EG		0
146	1307	<i>Garrulax cachinnans</i>	Nilgiri Laughing Thrush	SHOLA	N	1
147	1309	<i>Garrulus jerdoni</i>	Whitebreasted Laughing Thrush	EG,MD	N	1
148	1390	<i>Alcippe poioicephala</i>	Quaker Babbler	EG,MD	N	1
149	1407	<i>Muscicapa latirostris</i>	Brown Flycatcher	DD		0
150	1408	<i>Muscicapa muttui</i>	Brownbreasted Flycatcher	EG		0
151	1409	<i>Muscicapa ruficauda</i>	Rufoustailed Flycatcher	EG		0
152	1411	<i>Muscicapa parva</i>	Redbreasted Flycatcher	EG		0
153	1427	<i>Muscicapa nigrorufa</i>	Black and Orange Flycatcher	SHOLA	N	1
154	1440	<i>Muscicapa rubeculoides</i>	Bluethroated Flycatcher	EG,MD		0
155	1442	<i>Muscicapa tickelliae</i>	Tickell's Blue Flycatcher	DD,MD		0
156	1445	<i>Muscicapa thalassina</i>	Verditer Flycatcher	GEN		0
157	1446	<i>Muscicapa albicaudata</i>	Nilgiri Flycatcher	EG	N	1
158	1449	<i>Culicicappa ceylonensis</i>	Greyheaded Flycatcher	EG,MD		0
159	1461	<i>Terpsiphone paradaisi</i>	Paradise Flycatcher	GEN		0

S. NO	SYNO	LATIN NAME	COMMON NAME	HABITAT	CAT.	END.
160	1465	<i>Hypothymis azurea</i>	Blacknaped Blue Flycatcher	MD		0
161	1498	<i>Cisticola juncidis</i>	Streaked Fantail Warbler	GL		0
162	1503	<i>Prinia hodgsonii</i>	Franklin's Wren warbler	DD,MD		0
163	1511	<i>Prinia subflava</i>	Plain Wren Warbler	GEN		0
164	1517	<i>Prinia socialis</i>	Ashy Wren Warbler	GEN		0
165	1538	<i>Orthotomus sutorius</i>	Tailor Bird	GEN		0
166	1546	<i>Schoenicola platyura</i>	Broadtailed Grass Warbler	GL	N	1
167	1549	<i>Acrocephalus aedon</i>	Thickbilled Warbler	GL		0
168	1550	<i>Acrocephalus stentoreus</i>	Indian Great Reed Warbler	GEN		0
169	1556	<i>Acrocephalus dumetorum</i>	Blyth's Reed Warbler	GEN		0
170	1557	<i>Acrocephalus agricola</i>	Paddyfield Warbler	GEN		0
171	1562	<i>Hippolais caligata</i>	Booted Warbler	DD		0
172	1567	<i>Sylvia curruca blythi</i>	Lesser Whitethroat	GEN		0
173	1574	<i>Phylloscopus collybita</i>	Chiffchaff	GEN		0
174	1579	<i>Phylloscopus affinis</i>	Tickell's Leaf Warbler	SCRUB		0
175	1592	<i>Phylloscopus inornatus</i>	Yellowbrowed Leaf Warbler	GEN		0
176	1601	<i>Phylloscopus magnirostris</i>	Largebilled Leaf Warbler	EG,SHOLA		0
177	1605	<i>Phylloscopus trochiloides</i>	Dull Green Leaf Warbler	GEN		0
178	1606	<i>Phylloscopus occipitalis</i>	Large Crowned Leaf Warbler	SHOLA		0
179	1637	<i>Brachypteryx major</i>	Rofousbellied Shortwing	SHOLA	N	1
180	1650	<i>Erithacus brunneus</i>	Blue Chat	EG		0
181	1661	<i>Copsychus saularis</i>	Magpie Robin			0
182	1665	<i>Copsychus malabaricus malabaricus</i>	Shama	MD		0
183	1700	<i>Saxicola caprata</i>	Pied Bush Chat	GEL		0
184	1720	<i>Saxicolides fulicata</i>	Indian Robin	DD		2
185	1723	<i>Monticola cinclorhynchus</i>	Blueheaded Rock Thrush	DD,MD,EG		0
186	1726	<i>Monticola solitarius</i>	Blue Rock Thrush	SCRUB		0
187	1728	<i>Myiophonus horsfieldii</i>	Malabar Whistling Thrush	MD,EG,SEG		5
188	1734	<i>Zoothera citrina cyanotus</i>	Whitethroated Ground Thrush	EG,MD		0
189	1741	<i>Zoothera dauma</i>	Golden Thrush	EG,SHOLA		0
190	1752	<i>Turdus merula</i>	Black Bird	SHOLA		0
191	1753	<i>Turdus merula nigropileus</i>	Blackcapped Black Bird	EG,DD		0
		FAMILY NECTARINIDAE				
192	1892	<i>Dicaeum agile</i>	Thickbilled Flowerpecker	MD		0
193	1899	<i>Dicaeum erythrorhynchus</i>	Tickell's Flowerpecker	DD		5

S. NO	SYNO	LATIN NAME	COMMON NAME	HABITAT	CAT.	END.
194	1902	<i>Dicaeum concolor</i>	Plaincoloured Flowerpecker	EG,MD		0
195	1908	<i>Nectarinia zeylonica</i>	Purplerumped Sunbird	DD,MD		6
196	1909	<i>Nectarinia minima</i>	Small Sunbird	EG,SHOLA		1
197	1912	<i>nectarinia lotenia</i>	Lotens Sunbird	GEN		0
198	1917	<i>Nectarinia asiatica</i>	Purple Sunbird	DD		0
199	1931	<i>Arachnothera longirostris</i>	Little Spiderhunter	EG		0
		FAMILY ORIOLIDAE				
200	952	<i>Oriolus oriolus</i>	Golden Oriole	DD,MD,EG		0
201	954	<i>Oriolus chinensis</i>	Blacknaped Oriole	MD,EG		0
202	958	<i>Oriolus xanthornus</i>	Blackheaded Oriole	GEN		0
		FAMILY PARIDAE				
203	1794	<i>Parus major</i>	Grey Tit	GEN		0
204	1809	<i>Parus xanthogenys</i>	Yellowcheeked Tit	EG,MD		0
		FAMILY PHALACROCORACIDAE				
205	26	<i>Phalacrocorax carbo</i>	Cormorant	GEN		0
206	27	<i>Phalacrocorax fuscicollis</i>	Indian Shag	GEN		4
207	28	<i>Phalacrocorax niger</i>	Little Cormorant	GEN		0
208	29	<i>Anhinga rufa</i>	Darter	GEN		0
		FAMILY PHASIANIDAE				
209	246	<i>Fringilla pondicerianus</i>	Grey Partridge	SCRUB		0
210	255	<i>Perdica asiatica</i>	Jungle Bush Quail	MD		5
211	263	<i>Perdica erythrorhyncha</i>	Painted Bush Quail	EG,MD		6
212	275	<i>Gallus spadicea</i>	Red Spurfowl	SCRUB		2
213	301	<i>Gallus sonneratii</i>	Grey Junglefowl	SCRUB,DD,MD	N	6
214	311	<i>Pavo cristatus</i>	Common Peafowl	SCRUB,DD	VU	5
		FAMILY PICIDAE				
215	798	<i>Picumnus innominatus</i>	Speckled Piculet	EG,MD		0
216	804	<i>Micropternus brachurus</i>	Rufous Woodpecker	DD,MD,EG		0
217	808	<i>Picus myrmecophoneus</i>	Little Scalybellied Green Woodpecker	DD,MD		5
218	815	<i>Picus chlorolophus</i>	Small Yellownaped Woodpecker	DD,MD		0
219	819	<i>Dinopium benghalense</i>	Lesser Golden backed Woodpecker	DD,MD		0
220	825	<i>Dinopium javanense</i>	Indian Goldenbacked Threetoed WP	DD,MD,EG		0
221	830	<i>Dryocopus javensis</i>	Indian Great Black Woodpecker	EG,SEG		0
222	847	<i>Picooides mahrattensis</i>	Yellowfronted Pied Woodpecker	DD		0

S. NO	SYNO	LATIN NAME	COMMON NAME	HABITAT	CAT.	END.
223	850	<i>Picooides canicapillus</i>	Indian Pygmy Woodpecker	DD		0
224	856	<i>Hemicircus canente</i>	Heartspotted Woodpecker	DD,MD		0
225	861	<i>Chrysocolaptes lucidus</i>	Larger Goldenbacked Woodpecker	DD,MD,EG		0
		FAMILY PITTIDAE				
226	867	<i>Pitta brachyura</i>	Indian Pitta	DD,MD,EG		5
		FAMILY PLOCEIDAE				
227	1938	<i>Passer domesticus</i>	House Sparrow	GEN		0
228	1949	<i>Petronia xanthocollis</i>	Yellowthroated Sparrow	SCRUB		0
229	1957	<i>Ploceus philippinus</i>	Baya	GEN		0
230	1968	<i>Lonchura striata</i>	Whitebacked Munia	DD,MD		0
231	1973	<i>Lonchura kelaarti</i>	Rufousbellied Munia	SCRUB		4
		FAMILY POPARGIDAE				
232	666	<i>Batrachostomus monilinger</i>	Ceylone Frogmouth	EG		0
		FAMILY PSITTACIDAE				
234	550	<i>Psittacula krameri</i>	Roseringed Parakeet	DD		0
235	558	<i>Psittacula cyanocephala</i>	Blossomheaded Parakeet	SEG,EG		0
236	564	<i>Psittacula columboides</i>	Bluewinged Parakeet	EG,DD		0
237	566	<i>Loriculus vernalis</i>	Lorikeet	DD,MD,EG		0
		FAMILY PYCNONOTIDAE				
238	1104	<i>Pycnonotus priocephalus</i>	Grayheaded Bulbul	EG,MD		1
239	1115	<i>Pycnonotus melanicterus flavivetrus</i>	Blackheaded Yellow Bulbul			0
240	1116	<i>Pycnonotus melanicterus gularis</i>	Rubythroated Bulbul	EG		0
241	1120	<i>Pycnonotus jocosus</i>	Redwhiskered Bulbul	GEN		0
242	1128	<i>Pycnonotus cafer</i>	Red-vented Bulbul	GEN		0
243	1135	<i>Pycnonotus xantholaemus</i>	Yellowthroated Bulbul	EG		6
244	1138	<i>Pycnonotus luteolus</i>	Whitebrowed Bulbul	DD,MD		4
245	1148	<i>Hypsipetes madagascariensis</i>	Black Bulbul	SHOLA		0
246	1144	<i>Hypsipetes indicus</i>	Yellowbrowed Bulbul	EG		3
		FAMILY RALLIDAE				
247	332	<i>Rallina eurizonoides</i>	Banded Crake	GEN		0
248	343	<i>Amaurornis phoenicurus</i>	Whitebreasted Waterhen	GEN		0
		FAMILY SITTIDAE				
249	1838	<i>Sitta frontalis</i>	Velvetfronted Nutach	EG,MD		0
		FAMILY STRIGIDAE				
250	608	<i>Tyto capensis</i>	Grass Owl	GL		0

S. NO	SYNO	LATIN NAME	COMMON NAME	HABITAT	CAT.	END.
251	609	<i>Phodilus badius</i>	Bay Owl			0
252	617	<i>Otus scops</i>	Scops Owl	DD		0
253	623	<i>Ottus bakkamoena</i>	Collared Scops Owl	DD		0
254	627	<i>Bubo bubo</i>	Eagle Owl	MD		0
255	628	<i>Bubo nipalensis</i>	Forest Eagle Owl	EG,MD		0
256	631	<i>Bubo zeylonensis</i>	Brown Fish Owl	EG,MD		0
257	639	<i>Glauclidium radiatum</i>	Junle Owlet	MD		0
258	639	<i>Glauclidium cuculoides</i>	Barred Owlet	GEN		0
259	642	<i>Ninox scutulata</i>	Brown Hawk Owl	DD,MD,SEG		0
260	652	<i>Athene brama</i>	Spotted Owlet	GEN		0
		FAMILY STURNIDAE				
261	987	<i>Sturnus malabaricus</i>	Greyheaded Myna	GEN		0
262	988	<i>Sturnus malabaricus blythi</i>	Blythys Myna	GEN		0
263	994	<i>Sturnus pagodorum</i>	Brahmini Myna	SCRUB		0
264	1006	<i>Acridotheres tristis</i>	Common Myna	GEN		0
265	1009	<i>Acridotheres fuscus</i>	Jungle Myna	GEN		0
266	1015	<i>Gracula religiosa</i>	Hill Myna	EGMD		0
		FAMILY TROGONIDAE				
267	712	<i>Harpactesa fasciatus</i>	Malabar Trogon	MD,EG		2
		FAMILY UPUPIDAE				
268	763	<i>Upupa epops</i>	Hoopoe	GEN		0
		FAMILY ZOSTEROPIDAE				
269	1933	<i>Zosterops palpebrosa</i>	White-eye	GEN		0
		DD = Dry deciduous, MD = Moist deciduous, EG = Evergreen, SEG = Semi-evergreen,				
		SCRUB = Thorn Forest and degraded areas, SHOLA = Montane shola, GL = Grassland.				
		GEN = Generally in all habitat types, Lake = Dams & Reservoirs.				
		Endemic categories				
		1= endemic to Western Ghats.				
		2= endemic to Indian Subcontinent				
		3= endemic to Sri Lanka and Western Ghats				
		4= endemic to Western Ghats, Cylone and Peninsular India.				
		5= endemic to India and Sri Lanka				
		6= endemic to Peninsular India and Western Ghats.				
		Cat.= IUCN Categories, EN = Endangered,				
		End. = Endemic, N = The species which have some significance as far as the region is concerned				

Appendix - 3.6 LIST OF MAMMALS IN ACA

S. NO.	COMMON NAME	LATIN NAME	SCH.	END	CAT.	HABITAT
	CERCOPITHIDAE					
1	Liontailed Macaque	<i>Macaca silenus</i> Linn.	I	En	EN	Wet evergreen forests
2	Bonnet Macaque	<i>Macaca radiata</i> Geoffroy	II	NE		General, All types of Habitats
3	Nilgiri Langur	<i>Presbytis johni</i> Fischer.	I	En	VU	General, All types of Habitats
4	Common Langur	<i>Presbytis entellus</i> Duffresne.	II	NE		Deciduous and scrub
	Lorisidae					
5	Slender Loris	<i>Loris tardigradus</i> Linn.	>?	NE	VU	Dry deciduous & Thorn forests
	Felidae					
6	Tiger	<i>Panthera tigris</i> Linn.	I	NE	VU	General, Degraded forests
7	Leopard	<i>Panthera pardus</i> Linn.	I	NE	VU	General, All types of Habitats
8	Jungle Cat	<i>Felis chaus</i> guildestaedt	II	NE		
9	Fishing Cat	<i>Felis viverrina</i> Bennett	I	NE	VU	
10	Leopard Cat	<i>Felis bengalensis</i> Kerr.	I	NE	VU	
11	Rustyspotted Cat	<i>Felis rubiginosa</i> Geoffroy	I	NE	IK	
	Viverridae					
12	Small Indian Civet	<i>Viverricula indica</i> Desmarest.	II	NE		
13	Common Palm Civet or Toddy Cat	<i>Paradoxurus hermaphroditus</i> Pallas	II	NE		General, All types of Habitats
14	Brown Palm Civet	<i>Paradoxurus jerdoni</i> Blanford.	II	NE		
15	Common Mongoose	<i>Herpestus edwardsi</i> Geoffroy.	IV	NE		Dry deciduous scrub forests agricultural fields
16	Ruddy Mongoose	<i>Herpestus smithi</i> Gray.	IV	NE		Scrub forests
17	Striped Necked Mongoose	<i>Herpestus vitticollis</i> Bennet.	IV	NE		Dry Deciduous, Scrub forests
18	Brown Mongoose	<i>Herpestus fuscus</i> Water house.	IV	NE		Dry Deciduous, Scrub forests & higher elevation coffee
	CANIDAE					
19	Jackal	<i>Canis aureus</i> Linn.	II	NE		Dry deciduous and scrub
20	Indian Fox	<i>Vulpes bengalensis</i> Shaw	II	NE		General, All types of Habitats
21	Dhole or Indian Wild Dog	<i>Cuon alpinus</i> Pallas	II	NE		General, All types of Habitats
22	Striped Hyena ?	<i>Hyaena hyaena</i> Linn.	>?	NE		Scrub forests Udumalpet range?

S. NO.	COMMON NAME	LATIN NAME	SCH.	END	CAT.	HABITAT
	URSIDAE					
23	Sloth Bear	<i>Melursus urcinus</i> Shaw	I	NE		General, All types of Habitats
24	Common Otter	<i>Lutera lutera</i> Linn.	II	NE		General, All types of Habitats
25	Smooth Indian Otter	<i>Lutera perspicillata</i> I. Geoffroy.	II	NE		General??, All types of Habitats
	MUSTELIDAE					
26	Nilgiri Marten	<i>Martes gwatkinsi</i> Horsfield.	II	En		No data
27	Rattel or Honey Badgar	<i>Mellivora capensis</i> Schreber	> ?	NE		General, Dry deciduous to scrub.
28	Indian Tree Shrew	<i>Anathana ellioti</i> Waterhouse	> ?	NE		
29	Grey Musk Shrew	<i>Suncus murinus</i> Linn	> ?	NE		
30	Fruit Bat	<i>Rousettus leschenaulti</i> Desmarest.	IV	NE		
31	Indian Flying Fox	<i>Pteropus giganteus</i> Brunnich.	V	NE		
	SCIURIDAE					
32	Large Brown Flying Squirrel	<i>Petaurista peturista philippensis</i> Elliot	II	NE		MD & DD
33	Small Travancore Flying Squirrel	<i>Petinomys fuscocapillus</i> (Jerdon)	I	NE	EN	No data
34	Grizzled Giant Squirrel	<i>Ratufa macroura</i> (Pennant)	I	En	EN	Dry Thorn forests
35	Indian Giant Squirrel	<i>Ratufa indica</i> Erxelben	II	En		General, DD, MD, SEG, EG, Plantation
36	Three Striped Palm Squirrel	<i>Funambulus palmarum</i> Linn.	> ?	NE		General, All types of Habitats
37	Dusky Striped Squirrel	<i>Funambulus sublineatus</i> Waterhouse	> ?	NE		Humid gullies and Bamboo growths
38	Five striped squirrel	<i>Funnambulus pennati</i>	IV			General, All types habitats
39	Common House Rat	<i>Ratus ratus</i>	V	NE		General All types of habitats
40	Bandicoot Rat	<i>Bandicota indica</i>	V	NE		General All types of habitats
41	Indian Porcupine	<i>Hystrix indica</i>	IV	NE		Moist rocky hill sides.
	Leporidae					
42	Blacknaped Hare	<i>Lepus nigricollis nigricollis</i>	IV	NE		General All types of habitats
	PROBOSCIDAE					
43	Indian Elephant	<i>Elephas maximus</i>	I	NE	VU	General All types of habitats
	BOVIDAE					
44	Gaur	<i>Bos gaurus</i>	I	NE	VU	Moist forests of all elevations

S. NO.	COMMON NAME	LATIN NAME	SCH.	END	CAT.	HABITAT
45	Nilgiri Tahr	<i>Hemitragus hylocrius</i>	I	En	VU	Grass lands and Shola systems
	CERVIDAE					
46	Sambar	<i>Cervus unicolor</i>	III	NE		General All types of habitats
47	Chital	<i>Axis axis</i>	III	NE		Edge specialist
49	Muntjac or Barking Deer	<i>Muntiacus muntjak</i>	III	NE		General All types of habitats
	TRAGULIDAE					
48	Indian Chevrotain or Mouse Deer	<i>Tragulus meminna</i>	I	NE	VU	General All types of habitats
	SUIDAE					
50	Indian Wild Boar	<i>Sus scrofa</i>	III	NE		General All types of habitats
	MANIDAE					
51	Indian Pangolin	<i>Manis crassicaudata</i>	I	NE	VU	Deciduous and scrub

Appendix 3.7 - Species Profiles

Lion Tailed Macaque - *Macaca silenus* (Linnaeus)

STATUS: Resident.

Distributed all over the Western Ghats of Southwestern India.

ECOSYSTEM USED

They are seen in Evergreen vegetation types between 2000 and 3000 ft. They normally stay in troops of 12 to 20 animals foraging through the canopy of evergreen forest trees. They seldom descend to ground.

HABITAT REQUIREMENTS

REARING: Newborn young ones are seen regularly in September month. The call is a peculiar cooing which is made often to keep contact with the other individuals of the group.

FEEDING: They are primarily frugivorous and the food mainly consist of young leaves and fruits of different tree species. They also feed on insects occasionally.

COVER: They are animals of the canopy and require contiguous forest canopy to travel and forage.

STRUCTURAL STAGE: All the Successional stages with tall trees are preferred

REFERENCES:

Prater, S.H. 1948 – The book of Indian Animals, BNHS, Bombay

White-bellied Treepie - *Dendrocitta leucogatra* (Gould)

STATUS: Resident

Endemic distributed from 10° N Latitude, southward through Western Ghats Mysore, Western Tamil Nadu and Kerala. Also reported from certain parts of the eastern Andhra Pradesh.

ECOSYSTEM USED

Moist Deciduous and Evergreen Forests

HABITAT REQUIREMENTS

REARING: Breeds normally in February to April and occasionally in August as well. Nest is a deepish cup of thorny twigs lined with small rootlets and climbers on tall trees, in Evergreen forests and 2-4 eggs are laid in a clutch.

FEEDING: Fruits seeds and nectar (*Bombax ceiba*) insects, small animals like lizards, young rodents, also eggs and nestlings of smaller birds. They were seen feeding on the termites from a termite mount broken by some other animals.

COVER: Exclusively dependent on the dense forest cover for breeding and are seen filtering in to the Dry deciduous Forests and Teak Plantation for feeding.

STRUCTURAL STAGE: Old Successional stages are preferred for breeding and rearing, and also are seen in monoculture plantations for feeding.

REFERENCES

Sálim Ali and Sidney Dillon Ripley 1983 “ Handbook of the Birds of India and Pakistan” together with those of Bangladesh, Nepal, Bhutan and Sri Lanka (Compact Edition), Oxford University Press, Delhi, Oxford, New York.

Grizzled Giant Squirrel - *Ratufa macroura*

STATUS: Resident & Endemic

Ratufa genus is called the living fossil from its similarity of its angle structure to the earliest known squirrel *Prosciurus* from the Oligocene, 35 myr. ago (Emry & Thoringhton1985). *R. macroura* spread to the Indian peninsula first and subsequently traveled to Sri Lanka. Now, it is distributed only in the southern part of the country in Western Tamil Nadu and Kerala. *R. macroura* has three subspecies *R. m. macroura*, *R. m. dandolena*, *R. m. melanochra*.

ECOSYSTEM USED

Riverine patches within the Dry deciduous and Southern Thorn forests.

HABITAT REQUIREMENTS.

REARING: Breeding starts in mid October, with the flowering of the *Tamarindus indica*. November to January is the birth and nursing season. They give birth to young only once in a year. The gestation period is four weeks and the young remain in the nest for 2-3 months. The young are weaned after 4 months; they stay with the mother for six months and then disperse.

FEEDING: Food mainly consists of fruits, seeds, leaves and bark etc. of a variety of plants. 37 plant species belonging to 26 families including 24 tree and three climber species are noted as food species for the taxa. (Justus & Johnsingh1994). Feeding varies with sex and age in the animal. Different plant species like *Tamarindus indica*, *Santalaum album*, *Pyrecantha volubilisi*, *Strychnos potatorum*, *Albizzia lebbeck*, *Celtis wighti*, *Bredelia retusa*, *Syzygium cumini*, *Terminalia arjuna*, *Terminalia bellerica*, *Holoptelia integrifolia*, etc. are most used species.

COVER: They are seen using the Dry deciduous scrub and southern Thorn forests and riparian forests for feeding purposes and breeding purposes.

STRUCTURAL STAGE: Middle and Old Successional stages are preferred.

REFERENCES:

Emry and Thorington, R. W. Jr. 1985. The tree squirrel *Prociuerus* (Siuridae, Rodentia), as a living fossil Incase of " Book on the Living Fossils" (eds.), N. Eldredge, Plenum Press, NY.

Justus Joshua and John Singh A. J. T. 1994. Ecology of the endangered Grizzled Giant Squirrel (*Ratufa macroura*) in Tamil Nadu, South India, Report. Wildlife Institute Of India.

Bonelli's Eagle - *Hieraaetus fasciatus fasciatus* (Velliot)

STATUS: Resident

Rather uncommon but widespread eagle distributed throughout India from Punjab to West Bengal, Assam and Eastern states; Kashmir up to Kanyakumari. Affects hills and plains equally.

ECOSYSTEM USED

Generalists; seen in all the vegetation types from Scrub to Wet Evergreen. Orchards interspersed with openings are preferred equally.

HABITAT REQUIREMENTS

REARING: Breeding principally in December and January; local variations are noted in the time of the year of breeding. Strict site fidelity is shown by the pairs and repeatedly nest is found to be made on the same tree and branch. Nest is a huge platform of twigs lined with fresh green leaves which is made every year. Clutch size normally of 2 are laid. Both the individuals share incubation. The pair also shares parental care, with male spending more time in hunting and female feeding the young from the hunt.

FEEDING: Birds, small mammals and lizards, which are hunted by ambushing from leafy outcrops of lofty trees, or flight pursuits. Rarely carrion eating is also noted. Regular prey includes mynas, green pigeons, crow-pheasants, partridges, pond heron etc.

COVER: As in feeding and breeding

STRUCTURAL STAGES: Old structural stages are preferred in both managed and unmanaged forest types and orchards.

REFERENCES

Sálim Ali and Sidney Dillon Ripley 1983 " Handbook of the Birds of India and Pakistan" together with those of Bangladesh, Nepal, Bhutan and Sri Lanka (Compact Edition), Oxford University Press, Delhi. Oxford, New York.

Bourdillon's Great eared Nightjar *Eurystomus macrotus bourdillonii* (Humes)

STATUS: Resident

Discontinuously distributed along Kerala and Western Tamil Nadu.

ECOSYSTEM USED

Evergreen and Moist deciduous forest types are preferred

HABITAT REQUIREMENTS

REARING: January to May is the season for breeding with a peak breeding activity seen from February to March. The eggs are laid in the mud and no nest is made. Nothing is known about the breeding biology.

FEEDING: Moths, bugs, beetles, flying termites, flying ants and other insects are caught in air and are eaten.

COVER: Seen in the rocky areas and clearings within evergreen and moist deciduous forest types and the same areas are used for the breeding and foraging activities.

STRUCTURAL STAGES: Old Successional stages are preferred in both managed and natural forest types.

REFERENCES.

Sálim Ali and Sidney Dillon Ripley 1983 " Handbook of the Birds of India and Pakistan" together with those of Bangladesh, Nepal, Bhutan and Sri Lanka (Compact Edition), Oxford University Press, Delhi. Oxford, New York.

Nilgiri Tahr - *Hemitragus hylocrius*

STATUS: Resident

Endemic inhabitant of the high mountain ranges of Southern India, including the Nilgiris, Anaimalais, at elevations of 4000ft to 6000 ft in general. Occasionally they are found in the lower elevations as well. Earlier records show that they were distributed all over the forested tracts but due to poaching and other pressures have been reduced to the present status.

ECOSYSTEMS USED

Open grasslands with steep cliffs, ravines and rocky areas along the high wavy mountains.

HABITAT REQUIREMENTS

BREEDING: Nilgiri Tahr breeds throughout the year with the peak parturition time being the July. Most of the young are born during the cool season of the year, i.e. from December to February. The gestation period is six months. Mostly the females of two-year age are ready for breeding.

FEEDING: Feeds on the fresh flush of grasses, large herds are seen when the new flushes come after a fire.

COVER: Prefers Open Grass lands and cliffs and are seldom seen in the Forested areas.

STRUCTURAL STAGES: They are animals of the open grasslands, which are considered as the old successional stage by some and as the early stage by others.

REFERENCES:

Prater, S.H. 1948 – The book of Indian Animals, BNHS, Bombay

Shaheen Falcon - *Falco perigrinus peregrinator*

STATUS: Migratory

Distributed throughout the Peninsula with an exception of the semiarid and the arid regions up to 2400-meter altitude of the Himalayas.

ECOSYSTEM USED

Found in all the ecosystems in general within its distribution range. Generally open type of vegetation is preferred more.

HABITAT REQUIREMENTS

REARING: Breeding season varies according to the local climatic factors. In Himalayas it is March to April where as in South India during the winters. Nest is a large compact platform of twigs sometimes lined with grass placed at an inaccessible place in a cliff face. They often do not make nests and eggs are laid directly on scanty grass growing on the ledge. 3-4 eggs are laid in one clutch and both the sexes take part in the parental duties and nest making.

FEEDING: The food consists of partridges, quails, pheasants etc. They can be easily trained to strike much larger prey like mallard, florican and jungle fowl.

COVER: They use the high canopy cover of trees to hide and hunt for the prey.

STRUCTURAL STAGES: A bird of open coastal area and water body bordered with tall trees.

REFERENCES:

Sálim Ali and Sidney Dillon Ripley 1983. "Handbook of the Birds of India and Pakistan" together with those of Bangladesh, Nepal, Bhutan and Sri Lanka. (Compact Edition), Oxford University Press, Delhi. Oxford, New York.

The Nilgiri Marten - *Martes gwatkinsi*

STATUS: Resident

Endemic, scarcely distributed, along the higher reaches of the Western Ghats; south of Coorg, Nilgiris, Anaimalais, and Travancore.

ECOSYSTEM USED

Montane Shola, Evergreen forests and Bamboo brakes along the streams; in the Dry deciduous and Moist deciduous Forest types.

HABITAT REQUIREMENTS

REARING: Young mother and young cub are seen hunting together once. Details of the breeding biology is not available.

FEEDING: They hunt birds, squirrels, raiding nests for young and eggs. On ground they virtually eat anything they can defeat or are harmless. They are bold hunters and are seen eating lizards, snakes, fowls, partridges, young deer, and carrion. They were also seen feeding on the nectar of flowers of trees like Silk Cotton tree.

COVER: They are extremely shy and prefer very dense thickets of the undergrowth.

STRUCTURAL STAGES: Old growth stages of the unmanaged forests are preferred.

REFERENCES:

Prater, S.H. 1948 – The book of Indian Animals, BNHS, Bombay

Spotted/ Wood Sandpiper - *Tringa glariola*

STATUS

Migratory winter visitor throughout the country; commonly seen during the season along the shores of jheels and lakes and paddy fields, around irrigation tanks etc. Ring recovery records show that most of the wintering population is coming for the old USSR 4200-6200km distances.

ECOSYSTEM USED

Aquatic, semi-aquatic habitats throughout the country.

HABITAT REQUIREMENTS

REARING: There are no breeding records from India. Interestingly the large sized females in the flock do most of the courting.

FEEDING: Chiefly tiny molluscs, crustaceans, insects, worms and small fishes.

COVER: A bird of the open wetlands.

REFERENCES:

Sálim Ali and Sidney Dillon Ripley 1983. "Handbook of the Birds of India and Pakistan" together with those of Bangladesh, Nepal, Bhutan and Sri Lanka (Compact Edition), Oxford University Press, Delhi. Oxford, New York.

Indian Pangolin - *Manis crassicaudatae*

STATUS: Resident

Throughout the Indian subcontinent. Both in plains and foothills south of the Himalayas.

ECOSYSTEM USED

A generalist, seen all through different vegetation types except the very high altitudes.

HABITAT REQUIREMENTS

REARING: No particular season is noted; they were seen with young in different seasons. The young, usually single are carried around on the tail of the mother, who curls into a tight ball on the slight hint of trouble. These curls are extremely difficult to open by the enemies. They are having a prehensile tail and are armed with powerful scales along the ventral side of the body and acts as shield for both mother and the young. Young are born with very soft scales and they grow very fast.

FEEDING: Food mainly consists of ants, ant's eggs, termites etc. in the wild conditions. The captive animals are seen to feed on the boiled eggs, fruits, milk, etc.

COVER: Breeding and feeding activities are carried out in the open and dense forest or agricultural land with equal enthusiasm and are also seen making dens in comparatively open forest under trees and rocks.

STRUCTURAL STAGES: Seen in almost all the vegetation types and even in the agricultural land.

REFERENCES:

Prater, S.H. 1948 – The book of Indian Animals, BNHS, Bombay

Nilgiri Langur - *Presbytis johnii* (Fischer)4

STATUS: Resident

Distributed all over the Western Ghats of Southwestern India.

ECOSYSTEM USED

They are seen in all the Deciduous and Evergreen vegetation types, including monoculture plantations and mixed orchards except for the highly degraded stages of the Deciduous Forests. They are also well adapted to the high altitudinal vegetation types and are commonly seen in the Motane Sholas as well. They are not seen in the lower plain Thorn forests.

HABITAT REQUIREMENTS.

REARING: The peak-breeding season is the beginning of the rainy season. Usually one infant at a time and same is taken care of by the mother.

FEEDING: Exclusive Leaf-eater and the food mainly consist of young leaves and fruits of different tree species.

COVER: They are animals of the canopy and require contiguous forest canopy to travel and forage.

STRUCTURAL STAGE: All the Successional stages with tall trees are preferred irrespective of managed or unmanaged Forests.

REFERENCES:

Prater, S.H. 1948 – The book of Indian Animals, BNHS, Bombay

Slender Loris - *Loris tradigradus* Linn.

STATUS: Resident

Resident endemic of hills and plains of Southern India. It is seen commonly in the Southern Thorn forests and the neighbouring agricultural lands in the Dindigul Division; and in the Bamboo tracts of the Topslip Range of the Anaimalai WLS in ACA.

ECOSYSTEM USED:

Seen in the Evergreen, Moist Deciduous, Dry Deciduous and Thorn Forests and agricultural land or human habitation near by where ever suitable habitats are left out.

HABITAT REQUIREMENTS

REARING: Nothing much is known about the species and the newborn babies are seen throughout the year. Young are nursed for a long time even after they are half grown.

FEEDING: Insects, lizards, small birds, frogs virtually any thing they can seize are seen eaten by them.

COVER: They prefer thick canopy cover for hiding in the daytime and breeding activities.

STRUCTURAL STAGE: Old and middle successional stages are preferred in both managed and unmanaged Forests.

REFERENCES:

Prater, S.H. 1948 – The book of Indian Animals, BNHS, Bombay

Nilgiri Pipit - *Anthus Nilghiriensis* (Sharpe 1885)

STATUS: Resident

A common resident, endemic of the hill stations of Western Tamil Nadu and Kerala and are seen breeding above 1000-2500m altitude.

ECOSYSTEM USED:

High Montane Shola and grass land system, Coffee, Cardamom plantations of similar altitudes.

HABITAT REQUIREMENTS:

REARING: Breeding takes place between April to July. Nest is coarse grass and grass blades lined with fine grass and rootlets, occasional feathers and fibers, grass stem etc. Usually placed among the roots of short grass, where the grass blades arching above gives a kind of cave like appearance or a socket pits in the mud walls well covered by grass and bushes along the roads and depressions, which are common in the high mountains. 2-3 eggs are laid in a clutch and it is seen both the parents taking care of the young.

FEEDING: Food mainly grass seeds, other small seeds, insects etc. collected from the grass on the ground; rarely are seen chasing the flying insects with a lot of flight maneuvers and thus catching them in the flight.

COVER: Bird of open country with bushes and inter mingling forest.

STRUCTURAL STAGES: Early successional stages are preferred.

REFERENCES:

Sálim Ali and Sidney Dillon Ripley 1983. "Handbook of the Birds of India and Pakistan" together with those of Bangladesh, Nepal, Bhutan and Sri Lanka (Compact Edition), Oxford University Press, Delhi. Oxford, New York.

Pompadour Green Pigeon - *Treron pompadora affinis*(Jerdon)

STATUS: Resident

Resident, subject to local movement purely on the basis of the food availability in Western and south western India, including Nilgiris, Palnis, and associated hill ranges, from about 20° N latitude southward through western Mysore, Kerala and Western Tamil Nadu.

ECOSYSTEM USED:

Evergreen and Moist Deciduous Forests are used.

HABITAT REQUIREMENTS

REARING: Breeding season mainly from December to March; nest as in other pigeons is flimsy platform of twigs in a moderate sized tree within the dense forest, normally at a height of 5-10m. Two eggs are laid in a single clutch and both the parents share the nest building and caring the young ones.

FEEDING: Fruits and berries mainly figs of various *Ficus* sp. and drupes of *Zizyphus* sp.

COVER: Dense forest cover is preferred for breeding where as it is seen using the edges and even agricultural land with good tree cover and fruiting trees for the feeding purposes.

STRUCTURAL STAGES: Old and middle successional stages are preferred.

REFERENCES:

Sálim Ali and Sidney Dillon Ripley 1983 “ Handbook of the Birds of India and Pakistan” together with those of Bangladesh, Nepal, Bhutan and Sri Lanka (Compact Edition). Oxford University Press, Delhi. Oxford, New York.

Whitebellied Shortwing *Brachypteryx major albivenris* (Blanford)

STATUS: Resident

Distributed along the Western Tamil Nadu and Kerala from c.900m to the highest point in the Western Ghats.

ECOSYSTEM USED

Montane shola and Evergreen forests of the higher elevations.

HABITAT REQUIREMENTS

REARING: Breeding season mainly March to June chiefly May after the onset of rains. Nest is a large green mass of mosses, with a shallow cup lined with rootlets, placed in mud holes along roadside banks or in Sholas and in tree hollows, usually within a meter from the ground. Eggs are almost invariably two.

FEEDING: Food consists of insects of various kinds usually caught from the ground and are seen mulching with thick undergrowth, in the Sholas.

COVER: They prefer thick forest cover for the feeding purposes, rarely seen outside the Sholas while crossing from one Shola to another in quick and short flights.

STRUCTURAL STAGES: They prefer Old growth stages in the unmanaged forests.

REFERENCES:

Sálim Ali and Sidney Dillon Ripley 1983 “ Handbook of the Birds of India and Pakistan” together with those of Bangladesh, Nepal, Bhutan and Sri Lanka (Compact Edition). Oxford University Press, Delhi. Oxford, New York.

Ceylon Frogmouth *Batrachostomus monilinger* Blyth.

STATUS: Resident

Distributed along the Western Ghats, in the western Tamil Nadu, Karnataka and Kerala apparently from 15°N latitude to the southern most tip of the country and Sri Lanka.

ECOSYSTEM USED

Evergreen and Moist Deciduous forests

HABITAT REQUIREMENTS

REARING: Breeding chiefly from January to April which also varies with the localities, like in Sri Lanka, they breed in the September. Nest usually a pad of c. 6cm in diameter, made of mosses, leaves and lined with the bird's underplumage, and camouflaged on the outer side with bits of lichen and bark of the tree. Placed in the fork of a small tree or on a horizontal branch c. 2-5m height from the ground. Single egg is laid.

FEEDING: Food mainly consists of moths, beetles, grasshoppers and winged termites caught in the flight. The bird usually perches on some tree stump and keeps a watch on the insects and catches them as soon as the same is located by sallying through the air.

COVER: Chiefly evergreen and moist deciduous forest cover is preferred for feeding and breeding activities.

STRUCTURAL STAGES: The bird prefers old successional stages.

REFERENCES:

Sálim Ali and Sidney Dillon Ripley 1983 " Handbook of the Birds of India and Pakistan" together with those of Bangladesh, Nepal, Bhutan and Sri Lanka (Compact Edition), Oxford University Press, Delhi. Oxford, New York.

Indian Little Ringed Plover *Charadrius dubius jerdoni*(Legge)

STATUS: Resident

Resident throughout the subcontinent from Himalayan foot hills to Kanyakumari in extreme south, from Sind to Assam.

HABITAT REQUIREMENTS

REARING: Chiefly from March to May in Continental and Peninsular India and December to June in South India. Nest a shallow unlined depression or cap usually in the open, sometimes near a bush or boulder. Eggs are very typical of the peg-top type of the Plover's egg and are usually four in number. Both the sexes share the incubation and tending the chicks, brooding them against rain and performing the broken winged display to distract the enemies and the intruders into the area. Incubation period is 22 days.

FEEDING: They mainly feed on insects (Weevils, Beetles, and dipterous larvae), worms, tiny crabs, etc. collected by wading along the shores and coastal areas.

COVER: As in feeding and breeding.

STRUCTURAL STAGES: Information not available

REFERENCES:

Sálim Ali and Sidney Dillon Ripley 1983 " Handbook of the Birds of India and Pakistan" together with those of Bangladesh, Nepal, Bhutan and Sri Lanka (Compact Edition). Oxford University Press, Delhi. Oxford, New York.

Peregrine Falcon *Falco perigrinus japonensis* (Gmelin)

STATUS: Migrant

Winter visitor (September to April) throughout the country affecting the rivers, lakes, lagoons and marshes up to 4000m altitude.

ECOSYSTEM USED:

Largely aquatic ecosystems are preferred.

HABITAT REQUIREMENTS:

REARING: They do not breed in India, Nest is a large compact platform of twigs sometimes lined with grass placed at an inaccessible place in a cliff face. They often make no nest and eggs are laid directly on scanty grass growing on the ledge. 3-4 eggs are laid in one clutch and both the sexes take part in the parental duties and nest making.

FEEDING: Food chiefly consists of water birds like ducks, geese, coots, moorhens, lapwings and other waders. They also predate on other birds like partridges, pigeons, Kaleej Pheasant (*Lophura melanocephala*), Imperial Pigeons, Chough, Caspian Tern and early flying bats are said to be the favourite food item. Robust female is said to attack much larger prey items than itself quiet often.

COVER: Information not available

STRUCTURAL STAGES: Information not available

REFERENCES:

Sálim Ali and Sidney Dillon Ripley 1983 “ Handbook of the Birds of India and Pakistan” together with those of Bangladesh, Nepal, Bhutan and Sri Lanka (Compact Edition). Oxford University Press Delhi. Oxford, New York.

Grey Junglefowl *Gallus sonneratii* Temminck 1813

STATUS: Resident

Species peculiar to the Southern India; distributed south of a line roughly from Mt. Abu in the west to Pachmarhi in Madhya Pradesh thence to Polavaram in Andhra Pradesh and with eastern extension locally from there. Thus it is distributed in Southern Rajasthan, Madhya Pradesh, Andhra Pradesh, Kerala and Tamil Nadu up to 1800-2500m altitude in Western Ghats.

ECOSYSTEM USED:

Affects all types of forest and secondary jungle, plantations and agricultural areas.

HABITAT REQUIREMENTS:

REARING: Breeding season is chiefly February to May varying with local conditions. Nest usually is a depression in the mud scraped with the feet and lined with leaf litter well hidden from the view, below thorny bushes. Eggs usually 5-6 though up to 10 eggs have been recorded. Cocks show a progressive polygyny i.e. pairing with individual females as they become sexually mature. Female alone does incubation and the incubation period is 20-21 days.

FEEDING: Feeds on grains, shoots of grass, tubers, berries, either gleaned from the ground or plucked from the bushes, fallen figs, insects especially grass hopper and termite, human excreta, and the seeds of Bamboo and *Strobilanthes*.

COVER: They prefer dense thickets for breeding purposes and are seen in the opening in and around forests for feeding purposes but escape to near-by bushes at the slightest hint of disturbance.

STRUCTURAL STAGES: All the successional stages are preferred in both the managed and unmanaged forest types.

REFERENCES:

Sálim Ali and Sidney Dillon Ripley 1983. "Handbook of the Birds of India and Pakistan" together with those of Bangladesh, Nepal, Bhutan and Sri Lanka (Compact Edition). Oxford University Press, Delhi. Oxford, New York.

Red Spur fowl *Galloperdix spadicea spadicea* (Gmelin)

STATUS: Resident

Distributed all along the Peninsular India south of the Gangetic Plain and also in west Nepal Terai and Uttar Pradesh up to 1000m altitude in general seen commonly even up to 1800m altitude in ACA.

ECOSYSTEM USED:

Open Moist Deciduous Forest types with bamboo thickets and rocky slopes or plain. Montane shola and grass land systems and coffee plantations in the ACA.

HABITAT REQUIREMENTS:

REARING: Overall January to June varying with local conditions, eggs are found practically throughout the year. Nest is a shallow depression scrapped in the mud well hidden from the view in the thickets of bamboo or other bushes, very rarely (sparsely) lined with leaves and other litter. Eggs commonly 3-5 and incubation period is not known. Cocks normally won't help in brooding the eggs but assist in tending the young and are monogynous.

FEEDING: Food consists of seeds, tubers, grains, berries, drupes, and insects like termites, molluscs normally with equal quantity of dirt are consumed.

COVER: A great skulker and keeps deep in the bushes and scrub for both breeding and feeding activities. Seen in the openings or clearings during dusk and dawn foraging.

STRUCTURAL STAGES: Seen in early, mid and old successional stages

REFERENCES:

Sálim Ali and Sidney Dillon Ripley 1983. "Handbook of the Birds of India and Pakistan" together with those of Bangladesh, Nepal, Bhutan and Sri Lanka (Compact Edition). Oxford University Press, Delhi. Oxford, New York.

Nilgiri Laughing Thrush *Garrulax cachinnans* Jerdon

STATUS: Resident

Locally common, but disjunctly distributed, along the Nigiris, Anaimalais and other adjacent hills of the Western Ghats from 1200m to the summit.

ECOSYSTEM USED:

Evergreen, moist deciduous forests are used generally, but they are seen in dry deciduous forests, interspersed with riparian patches, which are their favourite haunts.

HABITAT REQUIREMENTS:

REARING: The breeding season is overall February to July. Nest, cup shaped, made of roots, dead leaves, grass, small twigs, moss, and lichen lined with fine grass or with a few feathers and scraps of wool, usually placed at a height of 2-3 meters from the ground. The details of clutch size, incubation period etc. is not available for the species. It is noted that Pied Crested Cuckoo (*Clamator jacobinus*) brood parasitise this species.

FEEDING: Food consists of insects, and berries especially wild raspberry (*Rubus* Sp.) and hill guava (*Rhodomyrtus tomentosa*).

COVER: Even though very vocal in the distribution range they are highly evasive and prefer thickets for feeding and breeding purposes.

STRUCTURAL STAGES: They prefer the old successional stages only.

REFERENCES:

Sálim Ali and Sidney Dillon Ripley 1983. "Handbook of the Birds of India and Pakistan" together with those of Bangladesh, Nepal, Bhutan and Sri Lanka (Compact Edition). Oxford University Press, Delhi. Oxford, New York.

Vernal Hanging Parrot *Loriculus vernalis* (Sparman)

STATUS: Resident

Distributed widely but disjunctly along the forested tracts of whole Indian subcontinent including the coastal and Island systems (Andaman and Nicobar Is.).

ECOSYSTEM USED:

Evergreen and Moist Deciduous Forests

HABITAT REQUIREMENTS:

REARING: In general the breeding season is from January till April, but is subjected to the local variations with the climatic conditions. Nest is a vertical or oblique natural hole of sometimes 1meter length, in a rotten tree trunk or branch, normally at a height of 2-10m from the ground. These holes are enlarged at suitable points to make egg chamber, and usually there is a lateral entrance to this at the starting point of the hole. 3-4 eggs are laid in one clutch and the parental duties are shared with lion share of the job being done by the female.

FEEDING: Feeds on the soft pulp of fruits and berries, chiefly wild figs (*Ficus sp.*) largely supplemented by the flower nectar. They are least destructive in feeding methods and are thus acting as pollinators and dispersers. They are also fond of *Casuarina* seeds, bamboo grains and Teak.

COVER: They prefer Evergreen and Moist Deciduous Forests for the breeding cover, and are seen using the coffee and cardamom plantations and neighbouring agricultural land also for the feeding purpose.

STRUCTURAL STAGES: Old and middle successional stages are preferred.

REFERENCES:

Sálim Ali and Sidney Dillon Ripley 1983. "Handbook of the Birds of India and Pakistan" together with those of Bangladesh, Nepal, Bhutan and Sri Lanka (Compact Edition). Oxford University Press, Delhi. Oxford, New York.

Indian Peafowl *Pavo cristatus* Linnaeus

STATUS: Resident

Resident locally up to 200m altitude in the outer Himalayas and Peninsular Hills, practically throughout the subcontinent south and east of the Indus river, including Jammu and southern Kashmir. Eastward in Assam thence south through Nagaland, Manipur, Mizo and Chittagong west and south to the extreme tip of the Peninsula. It is well protected in several areas like Rajasthan, Gujarat, and Tamil Nadu etc. due to the religious sentiments. It is introduced to the Andaman and Nicobar Is.

ECOSYSTEM USED:

In wild state it affects the Moist and Dry deciduous forest in the neighbourhood of the rivers and streams. It is otherwise seen in all the vegetation types within its distribution range in close association with man.

HABITAT REQUIREMENTS:

REARING: Breeding season is chiefly after the onset of rains, that is from June, and lasts till the September last. The peak breeding period in southern India is from April to May. Nest usually is a scrap in the ground, usually not lined or if lined, crudely with twigs and litter. Nests are well concealed in the thickets and thorny bushes. Semi-feral birds are seen nesting in the old forts and flat rooftops in villages. 4-6 eggs are laid in one clutch and female alone does the incubation. The incubation period is c. 28 days.

FEEDING: They are omnivorous in food habits. Food consists of seeds, grains, lentils, groundnuts, and tender shoots of crops, flower buds, berries and drupes (eg *Carrissa*, *Lantana*, *Zizyphus*). Wild figs (*Ficus glomerata*, *F. microcarpa* etc.), centipedes, scorpions, lizards, small snakes, insects (eg. grass hoppers, beetles, caterpillars), grubs and worms are regularly found in the crops and stomachs and also the human excreta near the human habitations.

COVER: Dense scrub cover is preferred for the breeding activities.

STRUCTURAL STAGES: Middle and early successional stages are preferred.

REFERENCES:

Sálim Ali and Sidney Dillon Ripley 1983. "Handbook of the Birds of India and Pakistan" together with those of Bangladesh, Nepal, Bhutan and Sri Lanka (Compact Edition). Oxford University Press, Delhi. Oxford, New York.

Manipur Bush quail *Predicable manipurensis manipurensis* (Hume)

STATUS: Resident

Distributed in Manipur and Assam hill ranges south of Brahmaputra River. Cachar Khasi, and Naga hills up to 100-meter altitude ranges. They are also seen in the ACA.

ECOSYSTEM USED:

Affects moist Grassland and Scrub jungle.

HABITAT REQUIREMENTS:

REARING: Little is known about the breeding biology of the taxa.

FEEDING: Feeds on the lentils, grains, ants and other insects.

STRUCTURAL STAGES: Seemingly prefers the early successional stages.

REFERENCES:

Sálim Ali and Sidney Dillon Ripley 1983. "Handbook of the Birds of India and Pakistan" together with those of Bangladesh, Nepal, Bhutan and Sri Lanka (Compact Edition). Oxford University Press, Delhi. Oxford, New York.

Broadtailed Grassbird *Schoenicola platyura* (Jerdon)

STATUS: Resident

Resident of the Western Ghats complex from Belgaum to south up to Ashambu hills and east to Madurai district, from 900-2000m altitudes.

ECOSYSTEM USED:

Coarse grasslands and rocky hill sides.

HABITAT REQUIREMENTS:

REARING: Actual field records of the breeding season (s) are lacking and the nest with chicks and eggs are seen in the July and September and the males with highly developed gonads were caught in the month of March and April, which suggests a probability of two broods in a year. Nest is a good sized ball of coarse grass blades with an entrance on its side, built in the tussocks of large tussock forming tall grasses up to a height of one meter. Clutch size and the period of incubation are not determined. Seemingly the female makes nest and male guards the territory.

FEEDING: Food consists of various insects and worms(caterpillars) caught from the bushes and grasses while foraging.

COVER: Grassy and rocky areas are preferred for both feeding and breeding cover.

STRUCTURAL STAGES: Early successional stages are preferred.

REFERENCES:

Sálim Ali and Sidney Dillon Ripley 1983. "Handbook of the Birds of India and Pakistan" together with those of Bangladesh, Nepal, Bhutan and Sri Lanka (Compact Edition). Oxford University Press, Delhi. Oxford, New York.

Indian Emerald Dove *Chalcophaps indica indica* (Linn)

STATUS: Resident

Resident patchily distributed through out Indian subcontinent up to 1800m in lower Himalayas.

ECOSYSTEM USED:

Moist deciduous, Dry deciduous, & Evergreen forests, Orchards & plantations also frequented.

HABITAT REQUIREMENTS:

BREEDING: Practically through out the year but shows an increase in March to May in Northern States and April to May & November December in Kerala and Tamil Nadu, where winter is not severe. Nest is a typical pigeon nest but more compactly built and some what more camouflaged, 2-3m height on a bamboo brake or sapling thickets. Two eggs are laid in a clutch and both sexes share the chores. Incubation period is 12 days which needs to be confirmed.

FOOD: Grain, seeds, berries are eaten normally. Occasionally small insects & termites are caught from ground and are eaten.

COVER: Prefer shady areas

STRUCTURAL STAGES: Information not available

REFERENCES:

Sálim Ali and Sidney Dillon Ripley 1983 “ Handbook of the Birds of India and Pakistan” together with those of Bangladesh, Nepal, Bhutan and Sri Lanka (Compact Edition). Oxford University Press, Delhi, Oxford, New York.

Indian Swiftlet *Collocalia unicolor* (Jerdon)

STATUS: Resident

The coastal & Western Ghats strip from about Ratnagiri, S. Konkan, through Goa, Western Tamil Nadu, Kerala up to Kanyakumari up to 2200m altitude range, only echo locating bird of Asia.

ECOSYSTEM USED:

Found in all the Ecosystems where there is availability of suitable microhabitats like large natural caves & grottoes, found up to 2200m altitudes.

HABITAT REQUIREMENT:

BREEDING: Chiefly March to June Nest a cup of hardened saliva, strengthened by the grass, moss & feathers, attached to the vertical wall of the cave. The attachment and cementing material is of pure coagulated saliva, which is of high market value. Usually 2 eggs are laid in a clutch. The incubation period and other details needs to be studied.

FOOD: Insects, which are caught in air.

COVER: They are birds of the open sky and even while resting they are on the wings, resting, needs shady caves for making nests.

STRUCTURAL STAGES: Information not available

REFERENCES:

Sálim Ali and Sidney Dillon Ripley 1983 “ Handbook of the Birds of India and Pakistan” together with those of Bangladesh, Nepal, Bhutan and Sri Lanka (Compact Edition). Oxford University Press, Delhi, Oxford, New York.

Novick A. 1959. Acoustic orientation in cave swiftlet” *Biol. Bull. Mar. Inst. Lab. Woods Hole* 117:497-503.

Large Green Barbet - *Megalaima zeylanica* (Gmelin)

STATUS: Resident

Kerala, Southern Tamil Nadu, Mostly in low country & foot hills up to 1500m.

ECOSYSTEM USED:

Moist Deciduous, Dry Deciduous, Evergreen Forests

HABITAT REQUIREMENT:

BREEDING: Chiefly February to April. Nest a hole in rotten vertical tree stem or branch, excavated by themselves. Eggs are laid simply in the bed of chips of wood fallen down during excavation. Both sexes share parental care.

FOOD: Wild figs, large variety of drupes & berries, flower petals e.g. *Bauhinia*, Nectar, (Semul, *Erythrina* sp.) Occasionally insects, beetles, flying ants etc. are also taken.

COVER: Information not available

STRUCTURAL STAGES: Large Old growth stands are preferred.

REFERENCES:

Sálim Ali and Sidney Dillon Ripley 1983 “ Handbook of the Birds of India and Pakistan” together with those of Bangladesh, Nepal, Bhutan and Sri Lanka (Compact Edition). Oxford University Press, Delhi, Oxford, New York.

Southern Green Imperial Pigeon - *Ducula aenea pusilla* (Blyth)

STATUS: Resident

Common in peninsular India, chiefly in Eastern & Western Ghats up to Mumbai in appropriate Ecosystems.

ECOSYSTEM USED:

Affects Moist Deciduous, Evergreen forests, Plains & foothills equally affected.

HABITAT REQUIREMENT:

BREEDING: Principally Feb-June Nest a flimsy platform of twigs made at the bifurcation of branches. Eggs usually one. Details of courtship and breeding not available.

FOOD: Figs nutmegs, berries in general & specifically the berries of marking nut (*Semicarpus anacardium*) and buds of Mangrove *Avicennia* sp. are preferred.

COVER: Prefers Evergreen tall trees for breeding and feeding purposes.

STRUCTURAL STAGES: Old growths with snags & dry poles.

REFERENCES:

Sálim Ali and Sidney Dillon Ripley 1983 “ Handbook of the Birds of India and Pakistan” together with those of Bangladesh, Nepal, Bhutan and Sri Lanka (Compact Edition). Oxford University Press, Delhi, Oxford, New York.

Nilgiri Wood Pigeon : *Columba ilphinstoni* (Sykes)

STATUS: Resident

Resident, endemic, distributed along Western Ghats from Kerala, Northwards to Mumbai & slightly beyond up to 19° N latitude.

ECOSYSTEM USED:

Moist Evergreen forests in foothills and up to 2000-m altitude.

HABITAT REQUIREMENT:

BREEDING: Seen breeding at the end of summers and beginning of rains i.e. April-June. Nest is a small platform of trees placed on a moderate sized tree in Shola. A single egg is laid. Details of the breeding biology yet to be studied.

FEEDING: Various fruits, berries, buds, small snails (Jerdon) and are also seen eating wattle seeds in Kodaikkanal.

COVER: Prefers Montane Shola exclusively for the breeding.

STRUCTURAL STAGES: Old growth and dense trees.

REFERENCES:

Sálim Ali and Sidney Dillon Ripley 1983 “ Handbook of the Birds of India and Pakistan” together with those of Bangladesh, Nepal, Bhutan and Sri Lanka (Compact Edition). Oxford University Press Delhi. Oxford, New York.

Malabar Parakeet *Psittacula columboides* (Virgo)

STATUS: Resident

Common Endemic of the Forested tracts of the Western Ghats up to c. 19° N Latitude, North of Mumbai, including Nilgiri, Palni and associated hills of Tamil Nadu, Kerala, Karnataka and Maharashtra, chiefly up to 500-1500m altitudinal ranges.

ECOSYSTEM USED:

Evergreen and semi-evergreen forest types, cultivation within the forest and Coffee plantations

HABITAT REQUIREMENTS:

REARING: Breeding mainly from January to March. Nest usually a hole made on the tree trunk in forest or natural cavities or woodpecker nests, which are altered to suit the needs, in similar situations, between 6-30 m height. Lofty Iron Wood trees (*Mesua ferrea*) are preferred irrespective of the extra effort needed in making the nest. Normally 4 eggs are laid in one clutch and both the parents share the chore of the nest building and rearing of the chicks. Incubation period and other details of the taxa are not available.

FEEDING: Food consists of different grains, seeds, figs (*Ficus* sp.), flower petals and nectar of *Erythrina*, *Grevillea*, *Bombax ceiba*. The first two species of trees along with *Ficus glomerata* are commonly grown in the Coffee plantations neighbouring Evergreen Forests and are frequented for fruits and flowers. They were seen feeding on the Jowar (*Sorghum*) and Cereals and Peas cultivated by the Tribal communities and are highly destructive in the feeding.

COVER: Evergreen Forests are used as breeding cover, and also to escape from predation where as the neighbouring vegetation types including the Semi-evergreen, Moist Deciduous Forests and cultivated lands are used for feeding.

STRUCTURAL STAGES: Old Successional stages and Plantations

REFERENCE:

Sálim Ali and Sidney Dillon Ripley 1983 “ Handbook of the Birds of India and Pakistan” together with those of Bangladesh, Nepal, Bhutan and Sri Lanka (Compact Edition). Oxford University Press Delhi. Oxford, New York.

Blackcrested Bulbul. (Rubythroated Sub sp.) *Pycnonotus melanicterus gularis*

STATUS: Resident & Endemic

Distributed along the Western Ghats from Western Mysore through Kerala and Western Tamil Nadu, in the lower plains and foothills up to 1200m altitude.

ECOSYSTEM USED:

Affects edges of the Evergreen forests, Bamboo brakes, thickets in the forest clearings, Dry evergreen patches along the slopes and thorny *Mimosa* and *Lantana* covered secondary jungle and avoids the cultivated areas.

HABITAT REQUIREMENTS:

REARING: Breeding chiefly from April to June. Nest is a flimsy cup of yellow dried or old leaves bounded lightly with cobwebs and grass stalks with a light lining of grass, which looks like windblown rubbish/ dead leaves on the bush normally at a height of 1-3 m from the ground. Nothing much is known about the breeding biology of the species.

FEEDING: Food mainly consists of different berries, wild figs and insects. The bird was commonly seen on the *Ficus microcarpa* during the fruiting season.

COVER: Extremely secretive and are seen flying into the thickets far off at the slightest disturbance.

REFERENCES:

Sálim Ali and Sidney Dillon Ripley 1983 “ Handbook of the Birds of India and Pakistan” together with those of Bangladesh, Nepal, Bhutan and Sri Lanka (Compact Edition). Oxford University Press Delhi. Oxford, New York.

Yellow-throated Bulbul *Pycnonotus xantholaemus* (Jerdon)

STATUS: Resident

Distributed patchily in Tamil Nadu, Southern Andhra Pradesh, Karnataka and Kerala along the rugged hilly tracts and dry areas.

ECOSYSTEM USED:

Southern Thorn Forests, Dry Deciduous Scrub, and open Dry deciduous Forests.

HABITAT REQUIREMENTS:

BREEDING: Mainly breeding occurs with the beginning of the rains i.e. May to July. Nest is cup of coarse twigs bound together by cobwebs as in the *P. melanicterus*, lined with fine fibers, rootlets and grass blades. Sometimes the nests are even made between the boulders along the steep slopes. 2-3 eggs are laid in a clutch. Nothing much is known about the breeding biology of the species.

FEEDING: Feeds on the wild berries, insects, figs.

REFERENCES:

Sálim Ali and Sidney Dillon Ripley 1983 “ Handbook of the Birds of India and Pakistan” together with those of Bangladesh, Nepal, Bhutan and Sri Lanka (Compact Edition). Oxford University Press, Delhi, Oxford, New York.

White-browed Bulbul *Pycnonotus luteolus luteolus* (Lesson)

STATUS: Resident

Distributed widely in the Southern part of the country roughly south of the 23° N latitude. A line from Ahmedabad through Southern Madhya Pradesh to the east up to the Hooghly River in West Bengal along the Eastern Ghats up to c. 1200m altitudinal range.

ECOSYSTEM USED:

Dry Open Scrub, Thorn Forests, open Dry Deciduous forests, scattered Lantana Brakes and gardens.

HABITAT REQUIREMENTS:

REARING: Breeding season mainly all through the year from January to December, defining a season for breeding for the taxa is difficult. Nest is usually made of twigs alone with lesser cobwebs alongwith smaller twigs for the binding purposes. Hair, rootlets and other materials are used to line the nest. The nest is usually placed at a height of 2-5 meters. The clutch size is usually 2. Nothing is available on the details of its breeding biology.

FEEDING: Food consists of fruits and berries (*Zizyphus Lantana, Mimesops, Streblus*) and various figs, and flower nectar (*Erythrina, Salmalia*, etc.), also spiders and insects.

COVER: Prefers thickets and thorny bushes for breeding and feeding purposes.

STRUCTURAL STAGE: Old successional stages and Middle successional stages are preferred.

REFERENCES:

Sálim Ali and Sidney Dillon Ripley 1983 “ Handbook of the Birds of India and Pakistan” together with those of Bangladesh, Nepal, Bhutan and Sri Lanka (Compact Edition). Oxford University Press, Delhi, Oxford, New York.

Brown-capped Pygmy Woodpecker *Dendrocopos nanus*(Virgos)

STATUS: Resident

Widely distributed all over the Peninsular India Northward to southern limit of the *Dendrocopos nanus* in Gujarat through Madhya Pradesh and east to Orissa, plains and foothills up to c. 1200m.

ECOSYSTEM USED:

Affects open Deciduous, Bamboo Forest and Secondary Jungle and groves of trees in and around cultivation.

HABITAT REQUIREMENTS:

REARING: Breeding season mainly March and April, varying locally. Nest is a tiny hole under 3cm in diameter drilled in a small dead branch between 2-12 meter height in open forest or in a mango grove. The hole is usually of a length of 5-10cm and with somewhat widened egg chamber. The nest when on the horizontal branch, the entrance hole is placed at the lower side of the branch. Normally care is taken to place the entrance facing away from the open areas to avoid easy detection. 2-3 eggs are laid in a clutch and the parental care and nest making are shared between the sexes. Incubation period and other details need study.

FEEDING: Chiefly insects and grubs, ants, bees, caterpillars, weevils, figs (*Ficus* sp.) fruits of *Buchnanania latifolia*, drupes, *Madhuca indica* flowers and flower nectar like *Salmalia*, *Erythrina*, *Bombax ceiba* and *Butea monosperma* thus helps in cross pollination of trees species.

COVER: Dry deciduous forests and groves are preferred for the breeding activities.

STRUCTURAL STAGES: Middle and Old successional stages are preferred in both managed and unmanaged forests.

REFERENCES:

Sálim Ali and Sidney Dillon Ripley 1983 “ Handbook of the Birds of India and Pakistan” together with those of Bangladesh, Nepal, Bhutan and Sri Lanka (Compact Edition). Oxford University Press, Delhi, Oxford, New York.

White-bellied Woodpecker *Dryocopus javensis* (Jerdon)

STATUS: Resident

Distributed along the humid tracts of the Western Ghats up to Tapti (c. 21°N) river in the north through Western Tamil Nadu, Western Mysore, Goa, Western Maharashtra and southern Gujarat. Also procured in the Bastar district of the Madhya Pradesh. Even though the distribution range is wide, it is locally restricted in distribution.

ECOSYSTEM USED:

Evergreen and semi-evergreen forest types.

HABITAT REQUIREMENTS:

REARING: Breeding season is primarily from January till March. Nest usual of Woodpecker hole on large sized tree trunks deep within the Evergreen forest patches at heights between 8-16 meter. The shaft and egg chamber are often up to 50 - 60cm deep. Normal clutch size is 2 and both the sexes take part in the excavation and other duties of parental care. They are extremely wary of the human presence, due to the hunting by tribals in different parts of the country.

FEEDING: Chiefly ants, termites, grubs, pupae of wood boring beetles. Even small honeybee (*Apis florea*) combs are excavated and fed on the bees and the pupae.

COVER: Evergreen forests are preferred for both the foraging and breeding activities.

STRUCTURAL STAGES: Old successional stages are only preferred.

REFERENCES:

Sálim Ali and Sidney Dillon Ripley 1983 “ Handbook of the Birds of India and Pakistan” together with those of Bangladesh, Nepal, Bhutan and Sri Lanka (Compact Edition). Oxford University Press, Delhi, Oxford, New York.

Heart Spotted Woodpecker *Hemicircus canente* (Lesson)

STATUS: Resident

Locally common, but patchily distributed in different parts of Peninsular India, along the Western Ghats from Kerala, Western Tamil Nadu, Karnataka, through Goa up to Gujarat and Hilly tracts of Madhya Pradesh to Chanda district of Orissa West Bengal, Assam through south of Brahmaputra River to Manipur, plains and foothills up to c. 1300m altitude.

ECOSYSTEM USED:

Moist Deciduous, Secondary Evergreen Forest and Plantations.

HABITAT REQUIREMENTS:

REARING: Breeding season starts from November and lasts till March and even to April. Nest a tiny hole drilled in to dry and dead branch usually between 3-4 meter height from the ground on a soft wooded tree like *Erythrina* or *Bombax ceiba*. The height of the nest can be considerably higher according to locality or availability of the favourable sites. Nest hole goes obliquely up to 20cm, ending in egg chamber slightly larger in diameter. 2 eggs are laid in a clutch. Other details are not available.

FEEDING: Food chiefly consists of ants, termites, grubs, and other smaller insects caught by tapping on the bark of thin branches. These birds are seen exclusively restricted to the very delicate branches of the soft wooded trees, and are particularly fond of the *Erythrina* sp., which are quite common all through ACA.

COVER: Not known

STRUCTURAL STAGES: Old successional stages are preferred in both the managed and unmanaged forest types.

REFERENCES:

Sálim Ali and Sidney Dillon Ripley 1983 “ Handbook of the Birds of India and Pakistan” together with those of Bangladesh, Nepal, Bhutan and Sri Lanka (Compact Edition). Oxford University Press, Delhi, Oxford, New York.

Asian Elephant *Elephas maximus*

STATUS: Resident

An object of worship, a target of hunters, a burden of beast, gentle in captivity, dangerous in the wild, the possession of the Kings, the companion of the tribals, a machine of war, an envoy of peace, loved, feared, and hated, the elephant has had an infamous association with man in Asia (Sukumar 1985). Once distributed all over the country now patchily distributed in roughly four major populations in the country. The present distribution of the Elephant in Indian subcontinent can be considered under four widely separated regions: 1. South Indian, elephants are distributed all along the hilly tracts of the Western Ghats, Eastern Ghats in the southern states of Karnataka, Tamil Nadu and Kerala. The ACA population comes under this region. 2. Northwest region, elephants of the Himalayan foothills in the *Terai* forests, population in the Eastern Dehradun, Shivalik, Lansdowne, Bijnor, Kalagarh, Ramanagar, Corbett National Park, and Haldwani. The TCA population comes in this region. 3. Central Indian region, elephants of the Simlipal tiger Reserve, Bihar, Orissa, West Bengal come in this region. 4. Northeast Indian region, elephants of the Himalayan foothills of Bhutan, north West Bengal, border eastwards in to the states of Assam, Meghalaya, Manipur, Mizoram, Tripura, and Meghalaya come in this region. The GCA Population is a part of this region.

Within these four major populations the elephants are further fragmented in distribution and are in a highly fragmented population state.

ECOSYSTEM USED:

They are found to utilize all the major ecosystems, like Evergreen, Montane Shola, Grassland, Moist Deciduous, Dry deciduous, Thorn forest types to scrub jungle and monoculture plantations like Teak, Eucalyptus, Coffee and cardamom plantations.

HABITAT REQUIREMENTS:

REARING: The first calving age in elephants normally varies from 12-20 years. Even though puberty may be reached even by the age of 11 itself, conceiving takes a longer time by various reasons in the wild and in captivity. Normal gestation period is 20-22 months in Indian Elephants.

FEEDING: The quantity of the food consumed, depend on the age sex and the size of the animal. Laws et al. (1975) estimate that an elephant need 1.5% of the dry weight fodder or 6% of fresh fodder of its total weight for daily consumption. Though a generalist feeder, the most commonly eaten plants are from only four botanical taxa - the order Malvales and the families Leguminosae, Palmae, and Gramineae. These account for the 72% of the recorded food species (Sukumar, 1985).

REFERENCES

Daniel JC & Datye Hemant, " A Week with Elephants", BNHS, Mumbai.

Kerala Warty Frog *Limnonectes keralensis*

STATUS: Resident

Distributed along the Western Ghats; Kerala, Western Tamil Nadu, Goa, Karnataka, up to 7000ft height.

ECOSYSTEM USED:

Seen along the major Water bodies of its distribution range, in the forested tracts of the country.

HABITAT REQUIREMENTS:

REARING: Information not available

FEEDING: Information not available

COVER: Information not available

STRUCTURAL STAGES: Information not available

REFERENCES:

Malcom A. Smith, (1974) The Fauna of British India, Including Ceylon and Burma. Reptilia and Amphibia Vol. II-Sauria.

***Melanobatrachus indicus* Beddome 1878**

STATUS: Resident

Distributed along the forested tracts of South Indian Hills, in the states of Tamil Nadu (Kalakkad Mundanthurai Forests, Anaimalais) and Kerala (Travancore hills).

HABITAT REQUIREMENTS:

REARING: Information not available.

FFEDING: Information not available.

COVER: Information not available.

STRUCTURAL STAGES: Information not available.

REFERENCES:

Malcom A. Smith, (1974) The Fauna of British India, Including Ceylon and Burma. Reptilia and Amphibia Vol. II-Sauria.

Large Wrinkled Frog *Nyctibatrachus major* Boulenger 1882

STATUS: Resident

An endemic resident of the Western Ghats, distributed through the south Malabar, at 1500-4000ft, Wayanad District in Kerala and in the Anaimalai hills, and Tirunelveli district of Tamil Nadu

ECOSYSTEM USED:

Evergreen, Moist Deciduous, Montane shola forests, along the hill streams.

HABITAT REQUIREMENTS:

REARING: No information available on the breeding biology of the species.

FEEDING: No information available on the feeding and foraging of the species.

COVER: Information not available

REFERENCES

Malcom A. Smith, (1974) The Fauna of British India, Including Ceylon and Burma. Reptilia and Amphibia Vol. II-Sauria.

Burrowing Frog *Tomopterna parambikkulamana* (Rao 1937)

STATUS: Resident

Distributed along the Anaimalai Hills of Tamil Nadu and Kerala.

ECOSYSTEM USED: Information not available

HABITAT REQUIREMENTS:

REARING: No information available on the breeding biology of the species.

FEEDING: No information available on the breeding biology of the species.

COVER: Information not available

REFERENCES:

Malcom A. Smith, (1974) The Fauna of British India, Including Ceylon and Burma. Reptilia and Amphibia Vol. II-Sauria.

***Arachnothera longirostris longirostris* (Latham) Little Spiderhunter**

STATUS: Resident

Disjunctly distributed all along the Western Ghats complex of south western India through north Kanara south through western Karnataka, Kerala and western Tamil Nadu, from the low country up to 2100meter altitude, Eastern Ghats from the extreme southeastern Nepal, Darjeeling and Jalpaiguri districts, Bhutan and Arunachal foothills, Manipur, Nagaland, Bangladesh, and Chittagong hill tracts up to 1500m altitudes and 1800m altitudes in Himalayas. Seen in ACA, TCA and GCA.

ECOSYSTEM USED:

Evergreen and Moist Deciduous Forests, Riverine vegetation, both dense forests and edges, secondary growths, Coffee and Cardamom Plantations, and Banana plantations.

HABITAT REQUIREMENTS:

REARING: Breeding season is mainly March to September. Nest is a compact cup made of skeleton of leaves, soft grass, vegetable down, neatly felted together; attached by its rim like an inverted dome to the underside of a banana leaf or similar broad leaves, by cobwebs or threads of vegetable cotton, passed through the leaf and neatly knotted on its upper surface, with a semicircular entrance hole at one side. Eggs usually 2 and occasionally 3 are laid. Both the birds share parental duties. Incubation period and other details are not yet determined.

FEEDING: They mainly feed on the insects, spiders, and nectar.

COVER: They prefer dense forest cover for both the breeding and feeding purposes

STRUCTURAL STAGES: They are seen utilizing all the three successional stages in both the managed and unmanaged forest types.

REFERENCES:

Sálim Ali and Sidney Dillon Ripley 1983 “ Handbook of the Birds of India and Pakistan” together with those of Bangladesh, Nepal, Bhutan and Sri Lanka (Compact Edition). Oxford University Press, Delhi, Oxford, New York.

Anaimalai Salea *Salea anamallayana* Roux

STATUS: Resident

Distributed along the southern Western Ghats in the Nilgiris and Anaimalai hills up to 7000ft altitude.

ECOSYSTEM USED:

Montane Shola and Grassland system.

HABITAT REQUIREMENTS:

REARING: No information is available on the breeding biology of the species.

FEEDING: Feeds on the insects termites and ants.

COVER: Are seen equally in Grassland interspersed with scanty scrubby vegetation and in the Montane Shola (*pers. Obser.*).

REFERENCES:

Malcom A. Smith, (1974) The Fauna of British India, Including Ceylone and Burma. Reptilia and Amphibia Vol. II-Sauria. PP179-180.

Bamboo Pit Viper *Trimeresurus gramineus* Smith

STATUS: Resident

Distributed along the peninsular India especially along the Western Ghats and Eastern Ghats Hill complexes, south of the latitude 22° N.

ECOSYSTEM USED:

Evergreen, Montane Shola, Moist Deciduous, and Dry Deciduous Forests.

HABIATAT REQUIREMENTS:

REARING: No details are available on the breeding biology of the species.

FEEDING: Food consists of small lizards, frogs and occasionally large insects.

COVER: Thick forest cover is preferred both for feeding and breeding purposes.

STRUCTURAL STAGES: Old successional stages are preferred.

REFERENCES:

Malcom A. Smith, (1974) The Fauna of British India, Including Ceylon and Burma. Reptilia and Amphibia Vol. II-Sauria.

Chapter 4

Social and Economic Situation

4.1 Existing Situation in the Conservation Area

The Conservation Area is part of the Western Ghats and is well-protected contiguous forest patch except the private tea holdings in Valparai plateau where the forest is fragmented. People in the lower tracts are mostly farming community, while within the Protected Area there are many tribal settlements. The tribal settlements presently do not have demarcated boundaries while RF boundaries have been clearly demarcated with the boundary stones. The people living in the plains and those living outside the PA and within the zone of influence do not have a great dependency on the sanctuary as the Parambikulam-Aliyar project scheme has boosted the agricultural economy in the buffer zone. Further more, the land holdings are mostly large and thus interference area is free from acute biotic pressures. While in the case of tribals living in enclosures within the PA, conflicts are intense and lack of improved agricultural practices, land holdings and amenities poses immense pressure on the forestland.

Location, extent, boundaries and natural attributes of ZI

Anamalai Conservation area is primarily constituted with Indira Gandhi Wildlife Sanctuary & NP, which extends over an area of 958 sq km, Dindigul Forest Division to 807 sq. km. and Kodaikanal Forest Division to 400 sq. km. The entire northern boundary of the protected area (Indira Gandhi Wildlife Sanctuary) from Pothamadai beat on the North Western side to Easalthittu East beat on the North

Eastern side runs along the pattaland of many villages. Nearly 13 major villages have the influence on the protected area in this belt with a population of over a lakh, of which, 10% of the strength exerts various degree of biotic pressures on the adjoining PA. Similar pressure is also present towards western side of the conservation area in Valparai plateau, where majority of the people are engaged in the tea, coffee and cardamom estates. Within the Protected Area, the zone of influence spreads around 36 tribal settlements, which again varies depending upon the size, community pattern and geographical location of each settlement. The Kodaikanal Forest division spreads over the jurisdiction of nearly 17 villages, which impose pressures towards the northern portion of the conservation area, and agriculture happens to be the main occupation of the people. The pressure in terms of population is over 1 lakh, which is 0.59 ha per capita forest area. Dindigul Forest area is also constituted primarily with agricultural villages and the only hill tribal community found in the division is of palyars, who are mainly backward classes and their dependency is mainly on the non-timber forest produce. The northern boundary of the Dindigul forest division adjoins Kodaikanal forest division and Southern boundary with the Madurai forest division. Pressures on this managed forest are also experienced from the eastern side, which adjoins the agricultural fields.

Villages inside and outside the PA

Indira Gandhi Wildlife Sanctuary and National Park extending to an area of 958 sq. km constitute the only protected area, which falls in ACA.

Entire Northern boundary of the sanctuary runs along the pattalands of many villages: mainly Odaikulum, Vettaikaranpudur, Sethumadai, Kottur, Arthanaripalayam, Andiyoor, Parthiyur, Karattur, Vellakundapuram, Dhali, Jallipatti, Kallapuram and Andipatti. The population in these villages is over 1 lakh and the main occupation is of agriculture. As regards to the tribal settlements within the protected area is concerned, there are more than 4600 tribals living in 36 tribal settlements. They belong to various tribal communities viz. Kadar, Pulaiyar, Malasar, Malai Malaisar and Muduvar. These tribals form an integral part of the sanctuary and their population also has fluctuated over a period of time due to the various forestry operations.

The tribal settlements in different ranges are:

Pollachi Range - Thammampathi, Sarkarpathi, Nagaruth, Chinnarpathi.

Ulandy Range - Erumaparai, Kozhikamuthi, Varagaliar, Koomatti

Valparai Range- Nedumkundru, Kavarkal, Kadamparai, Vellimudi, Karumutti, Mavadappu, Ettakuli, Punachi.

Manamboly Range- Sankarangudi, Sundarankudi, Kallar, Palaganar

Amaravati Range -Karattupatti, Thalinji, Manjampatti, Mungilpallam

Udumalpet Range- Kodanthur, Kottaiyar, Attumalai, Poochakottamparai, Jallimuthanparai, Easalthittu, Thalamedu, Kulipatti, Kurumalai, Pulliampatti, Thirumurthi, Selaiyuth

Map 4.1 Shows the locations of all the tribal settlements.

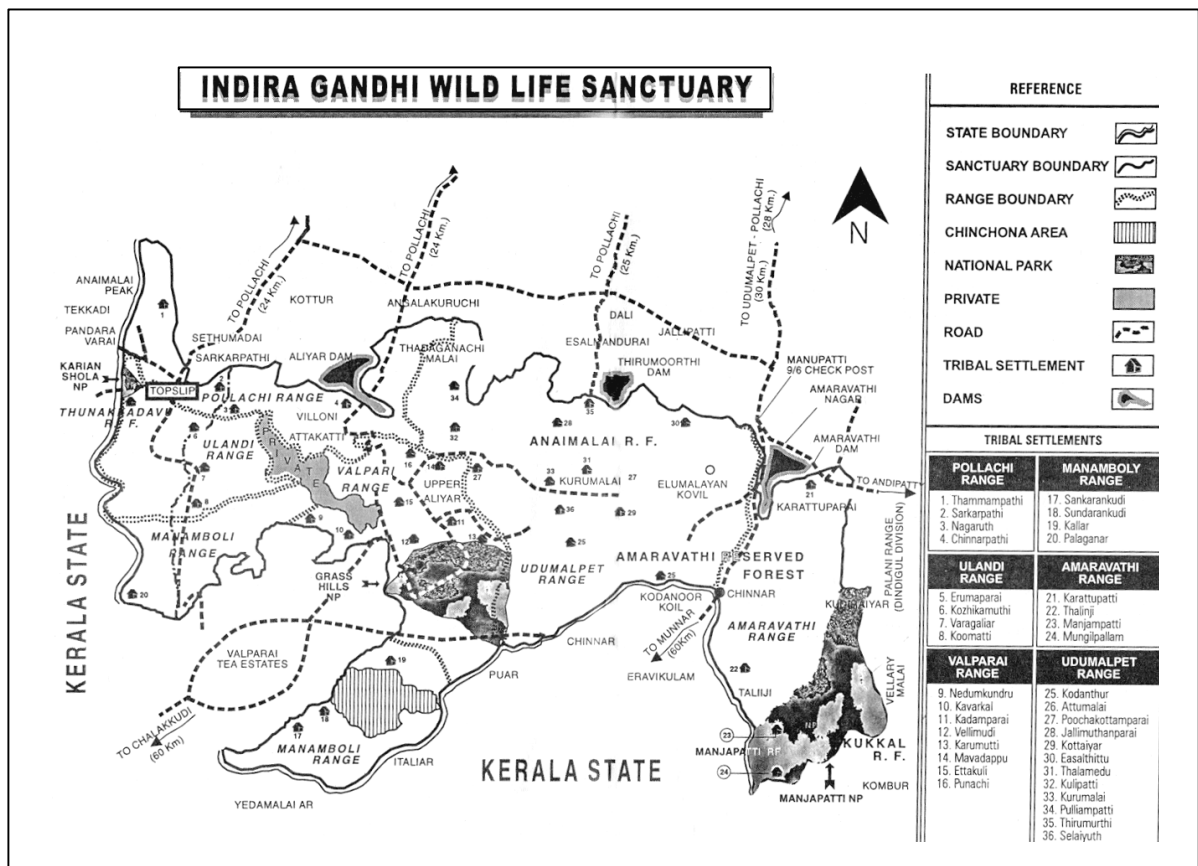


Table - 4.1 Non Tribal Villages along the Periphery of Sanctuary

Sl. No.	Name of Villages
1.	Angalakurichi
2.	Kavirachettipalayam
3.	Pilchinnanpalayam
4.	Timraiyur
5.	Kambalampatti
6.	Arthanaripalayam
7.	Kaliapuram
8.	Odayakulam
9.	Sethumadai
10.	Anamalai
11.	Vettaikaranpudur
12.	Somendurai
13.	Pothanayakkanur
14.	Govindapuram
NAME OF TALUK : VALPARAI	
1.	Valparai
NAME OF TALUK : UDUMALPET	
1.	Kattoor
2.	Chinnakumarapalayam
3.	Kumarapalayam
4.	Dhali-I
5.	Thirumoothy Nagar
6.	Dhali-II
7.	Kurchikottai
8.	Kurchikottai
9.	Andikoundanur
10.	Talyamuthur
11.	Amaravathy
12.	Kallapuram
13.	Devanur pudur
14.	Lingamanur
15.	Onakallur
16.	Elayanmuthur
17.	Ruthrapalayam
18.	Kumaralingam
19.	Madalamparai
20.	Parthiyur

Table -4.2 List of the tribal settlements with demographic details.

S. No.	Range	Tribal Settlement	Community	Men	Women	Total	
1	Pollachi	Sarkarpathy	Malasar	111	100	211	
2		Nagarrooth	Malai Malasar	16	13	29	
3		Chinnarpathy	Malai Malasar	38	44	82	
4		Tammampathy	Malasar	107	91	198	
				Total	272	248	520
5	Udumalpet	Kodanthur	Pulaiyar	115	135	250	
6		Attumalai	Muduvar	28	34	62	
7		Poochakottamparai	Muduvar	40	35	75	
8		Jallimuthan-parai	Pulaiyar	15	17	32	
9		Kottaiyar	Pulaiyar	17	21	38	
10		Easalthittu	Pulaiyar	60	55	75	
11		Thalameddu	Muduvar	35	30	65	
12		Kullipatti	Pulaiyar	160	147	307	
13		Kurumalai	Pulaiyar	65	60	125	
14		Pulliampatti	Pulaiyar	12	14	26	
15		Thirumoothi	Pulaiyar	75	68	143	
				Total	622	616	1238
16	Amaravati	Karattupatti	Pulaiyar	62	63	125	
17		Manjampatti	Pulaiyar	19	19	38	
18		Thalinji	Pulaiyar	168	155	323	
19		Mungilpallam	Pulaiyar	22	18	40	
				Total	277	255	526
20	Ulandy	Varagliar	Malasar	63	57	120	
21		Eru-maiparai	Kadars	178	58	236	
22		Kozhikamuthy	Malasar	225	195	420	
23		Koomatti	Malai	50	60	110	
				Total	516	370	886
24	Valparai	Nedunkundru	Kadar	43	51	94	
25		Kavarakkal	Kadar	45	38	83	
26		Kadamparai	Kadar	20	25	45	
27		Vellimudi	Muduvar	40	50	90	
28		Karumutti	Muduvar	47	42	89	
29		Mavadappu	Pulaiyar	180	175	355	
30		Ettakuli	Kadar	20	25	45	
31		Punachi	Pulaiyar	60	50	110	
				Total	450	456	911
32	Manamboly	Sankarankudi	Muthuvar	46	47	93	
33		Sundarankudi	Kadar	62	42	104	
34		Palakanar	Kadar	27	24	51	
35		Kallar	--	24	20	44	
				Total	159	133	292

Table -4.3 Population Details of Dindigul Division (1991 Census)

Sl. No.	Taluk	Population
1.	Palani	4,17,190
2.	Dindigul	6,41,378
3.	Vedasandur	2,56,232
4.	Nilakottai	2,27,976
5.	Natham	1,19,222
6.*	Kodaikanal	98,598
	Total	17,60,596
	Rural	13,83,575
	Urban	3,77,021
	Total	17,60,596
	Male	8,90,780
	Female	8,69,816
	Total	17,60,596

Ethnic identities, traditions, customs

The main tribal communities in the sanctuary area are Kadar, Pulaiyar, Malasar, Malai, Malasar and Muduvar. Their populations have fluctuated owing to the various forestry operations and stationing of different hydroelectric project like Parambikulam- Aliyar, Kadamparai, Sholayar- Nirar etc. The tribals who practiced a “Podu” pattern of agriculture have now almost settled in hamlets and taken to permanent agriculture, animal husbandry and other vocations.

During the course of time, drastic changes have undergone in many of the social customs of these tribals. The change has been accelerated mainly due to their exposure to the people from the plains. Sometimes, the magnitude of change is to such an extent that many of the distinct tribal features have totally disappeared. With the passage of time, many of the tribal groups from the same community have come closer and are now staying in the same settlement. Main tribal strength is from Kadar and Pulayars in the sanctuary.

Table -4.4 Villages in Kodaikanal division

Sl. No.	Name of the Village	Area (km ²)	Population 1991		
			Male	Female	Total
1.	Kodaikanal Municipality	21.45	14507	12916	27423
2.	Vilpatty	61.7	5819	5555	11374
3.	Poombarai	11.45	2634	2567	5201
4.	Manna-manurl	40.66	3792	3505	7297
5.	Kookal	5.49	2999	2729	5728
6.	Kumbarayar	4.86	300	283	533
7.	Poondi	10.22	3137	2934	6071
8.	Vadakavunji	2.05	2141	2032	4173
9.	Pachalur	40.66	1095	1111	2206
10.	Periyar	14.57	1676	1539	3215
11.	Thandigudi	18.86	1659	1520	3179
12.	Pannaikadu	24.34	4443	4427	8870
13.	Kamanur	35.12	2358	2220	4578
14.	Kilakkuchettypatti	15.10	1794	1707	3501
15.	Poolathur	35.12	2989	2943	5932
16.	Adukkam	4.32	1957	2007	3964
17.	Vellagari	6.17	348	318	666
	Total	325.79	53648	50313	103961

As regards to the ethnic identities and customs of some of the tribes: -

Kadars always keep aloof from the rest. Traditionally they were engaged in the timber logging operations both in Anamalai and Parambikulam, but now they draw their sustenance from various NTFP collections in the season and other departmental works. They live in the hilly regions situated in Valparai, Ulandy and Manamboly ranges.

Malasars were originally settled in Sungam in Kerala but after the reorganization of the states, they shifted to Varagliar and parts of Kozhikamuthi in Ulandy range. Earlier they used to practice “Kumri” cultivation (interspersed agriculture within forest) in

plantation but subsequently they were engaged in various forestry operations.

Malai Malasars are stated to be the most aboriginal of the tribals. They reside in the settlements located in Ulandy and Pollachi ranges. Their customs are similar to those of Malasars and specialize in different types NTFP collection.

Muduvars are found mostly in secluded and high altitude areas of Valparai & Udamalpet ranges. They have simple life style and also have counterparts in Kerala area.

Pulayars are mostly backward classes found in plain areas of Amaravati and Udumalpet ranges. These tribals have adapted to agricultural practices and were also responsible for certain detrimental pressures in the protected area.

During the course of time, many of the social customs and traditions have been lost. Currently, a situation of conflict exists in those settlements where younger generation wants to join the mainstream of civilization and older generation still wants to continue with the traditional life style.

Outside Protected Area

In the managed forest of Kodaikanal and Dindigul, as well as outside the conservation area, the majority inhabitants are Hindus. The native tribes in Kodaikanal division are Mannadiars and Vedars whereas in Dindigul area, Pulayars are found scattered amidst the forests of upper and lower Palanis. Basically, they are quite shy and avoid people. The native Muslims of Kodaikanal area are Labbais who were previously known as Sonagars (native of Arabia). They are partly the descendents of Arab traders or refugees.

Besides, there is a dominant Hindu community towards plains of Anamalai and Dindigul whose main occupation is agriculture and have big land holdings.

Also Chettiars, Nadars and Rowthers are having business and small-scale industries and control the economic power in Kodaikanal division.

Relationships between groups of people

As regards the tribal communities especially Kadar, Malasar and Malai Malasar is concerned, the community is quite strict about their marriage and relationships with the other communities. They prefer to marry only amongst their community members not only from the same settlement but also with the different settlement. However, in Pulayars, who reside mostly in the plains, it is noticed that many outsiders have known to marry tribal women primarily for gain in many settlements. Marriage between a man and his maternal uncle's daughter or sister's daughter is permitted (preferred). Widow remarriage is also allowed.

Most of the tribals in the protected area consequent to the stoppage of forestry operations have taken up to agriculture in the smallholdings available with them and also work as labour force. In the hilly tracts of Valparai they are engaged in the tea and coffee estates whereas in the plains, they are employed in the agricultural fields of big landlords. Forest deptt. also creates employment opportunities but the same is restricted depending upon the availability of funds or season.

By and large, positive features of group dynamics in all these settlements and villages can be seen and there is a feeling of a single community. They obey the instructions of Moopan (headman) who takes various socio-economic decisions on behalf of the community. The business or any other socio-economic issue governs inter-community relationship.

Relationship with forests and grasslands

The major demands of the population in the past were for

? timber for building construction

- ? fuel & charcoal for domestic consumption
- ? small timber for agricultural implements
- ? bamboo & eucalyptus for pulp and rayon industries

Indira Gandhi Wildlife Sanctuary was earlier the part of Coimbatore South division and has been managed for timber, NTFP and other forest produces. After the declaration of the area as sanctuary, all the timber operations were stopped including removal of the bamboo and eucalyptus by the Paper & Rayon industries but collection of NTFP continued illicitly. As majority of the tribals were dependent on NTFP as a source of employment, collection of various non-timber forest products was permitted through the local

Sarkarpathi Hill Tribes Cooperative Society, Pollachi. Initially, nearly 58 produces were being collected before the declaration of area as sanctuary, but subsequently, this list was reduced to 24 number and later to 5 number in the last decade. Since 1998, due to the creation of alternative tribal employment programme, proposals were sent to the Govt. to stop collection of remaining NTFP as the same was not only considered as detrimental to the wildlife habitat but legal implications also did not allow for the same. Consequently, the society is now allowed to collect only tamarind within 1 km. peripheral belt of Pollachi Range alone as a tribal welfare measure.

Table -4.5 List of Non Timber Forest Products collected in the past and its subsequent reduction in collection over a period of time.

Sl. No.	Name of the produce	Botanical Name	Portions used
1.	Black dammer or Karunkugiliam	<i>Canarium strictum</i>	Gum
2.	Cardamom	<i>Elettaria cardamom</i>	Fruits
3.	<u>Gallnut</u>	<i>Terminalia chebula</i>	Fruits
4.	Silk cotton	<i>Bombax malabaricum</i>	Fruits
5.	Ginger	<i>Gingifer officinalis</i>	Stem tuber
6.	Gum kino	<i>Pterocarpus marsupium</i>	Gum
7.	<u>Honey</u>	-	-
8.	Indam bark	<i>Acacia intsia</i>	Bark
9.	Lavangam	<i>Cinnomomum zeylanicum</i>	Bark
10.	Lemon grass	<i>Cymbopogon spp.</i>	Leaves & Stem
11.	Mahali kilangu	<i>Gymnema montanum</i>	Root tuber
12.	Nannari ver	<i>Hemidesmus indicus</i>	Roots
13.	Eengi	<i>Caryota urens</i>	Leaves
14.	<u>Nellikai</u>	<i>Emblica officinalis</i>	Fruits
15.	Tree moss	-	Whole part
16.	Soapnut	<i>Sapindus emarginatus</i>	Fruits
17.	<u>Skekoy</u>	<i>Acacia concinna</i>	Fruits
18.	<u>Tamarind</u>	<i>Tamarindus indica</i>	Fruits
19.	Teeanika	<i>Terminalia belerica</i>	Fruits
20.	Turmeric	<i>Curcuma longa</i>	Stem tuber
21.	White dammer or Vellakungiliam	<i>Vateria indica</i>	Gum
22.	Wild Mangoes	<i>Mangifera indica</i>	Fruits
23.	Wild Pepper	<i>Piper longum</i>	Fruits
24.	Avaram bark	<i>Cassia auriculata</i>	Bark

Note : NTFP lease restricted to underlined items till very recently

As regards to the relationship of the people with the grasslands is concerned, nearly 31.22 sq. km. of area is under virgin Shola-grassland association popularly known as 'Grass Hills' and is part of the National Park area which is closed from all disturbances. Grazing of cattle is permitted in the lower reaches of Pollachi, Udumalpet & Amaravati ranges, where people do resort to putting of fire in the open patches for having fresh flush of grass. It is observed that non-palatable weed like *Eupatorium*, *Odaratium*, *Lantana camara* and *Cassia tora* grow profusely in such areas, which needs to be eradicated and monitored.

Initially all the tribal settlements in the Protected area used to collect thatch grass for the roofing of their houses but the same has now been replaced by zinc sheet roofs in all the settlements and hence, the pressure has been considerably reduced. Even the collection of lemon grass for oil distillation as NTFP has been completely stopped. The only pressure on grasslands is in the form of grazing pressure and that also is confined to few patches in the lower reaches of the protected area.

In the managed forests of Kodaikanal and Dindigul divisions, the main requirements of the local people from the forest is on the following counts:-

- ? firewood for domestic consumption
- ? timber for building construction
- ? small timber for agricultural implements and huts
- ? bamboos for domestic use and basket weaving
- ? non timber forest produce for various purposes
- ? Grasslands for pasture facilities, cattle fodder and grass for thatching

4.2 State of the Economy

Majority of the people are able to meet their sustenance requirements but the economic condition of all the tribal settlements inside the Protected area is far from satisfactory.

Vocations

Most of the people in Anamalai Conservation Area are mainly occupied with agricultural activities. The northern stretch of the protected area has vast land, which remains fertile throughout the year owing to the irrigation from Aliyar, Amaravati and Thirumoorthy dams since early 60's. Therefore, agriculture happens to be the most common occupation of the villagers. Towards higher elevation in Valparai region, people are more occupied with the plantation crops of tea, coffee and cardamom. Most of the people are engaged as labourers in these estates. In the 36 tribal settlements, tribals cultivate the land for various agricultural and horticultural crops and also seek employment as labourer with the Forest Deptt, adjoining estate or pattaland. Training in different vocations like sewing, driving, weaving, eco-guide etc. was also provided to few tribal youths during 1996-97 in the Protected Area under TRYSEM programme (Training Rural Youth for Self Employment). Poor people who are unemployed but live all along the belt of the protected area carry dead and green firewood as head loads. This is common in Kallapuram, Karattur, Parthiyur, Arthanaripalayam, Aliyar, Sethumadai, Odaikulum, adjoining tea estates and Cinchona deptt adjacent to the sanctuary area. Nearly 5 items of NTFP viz. Soapnut, Sheekkai, Gallnut, Tamarind & honey are collected through society. A similar situation is also prevailing in the managed forest divisions of Dindigul and Kodaikanal with the only difference that in Dindigul, focus is primarily on agriculture and in Kodaikanal it is on horticulture and other commercial crops.

Land Use

Towards the northern portion of the Protected area, the irrigated lands are cultivated with paddy whereas the other dry lands remain under groundnut and coconut. Few cash crops such as banana and silk cotton are also grown in certain places. It is interesting to note that few farmers have undertaken to the growing of Eucalyptus and mango orchards in the areas unfit

for raising paddy. In the Valparai region, the hilly tracts are mainly used for growing tea, coffee and cardamom crops. In the tribal settlements, chief crops grown are paddy, cholam, ragi, horse gram, groundnut, tapioca along with certain horticultural plants like coconut, citrus, banana, mango etc.

As regards to the Dindigul Forest Division, here again agriculture is the primary occupation with traditional equipment. Modern technology like tractors, motorized hand ploughs are gradually replacing the traditional spade (manvetti), plough (Kalappai) forks (Kothu) etc. Except part of Nilakkotai and Palani taluks, the rest of the areas get irrigation through perennial streams. The chief food crops grown are paddy, cholam, kampu, ragi, varagu, samai, horse gram and red gram. The main cash crops include groundnut, cotton, sugarcane, tobacco and sesame. In the lower Palanis, banana, coffee, cardamom and variety of citrus fruits can be seen whereas in the plain area it is dominated with coconut, mango and grapes. Wherever, the land is fertile with sufficient water, paddy, sugarcane and banana is cultivated whereas in rainfed areas, millet and cereals are present. For the past few years, cultivation is taken with the help of horticulture department.

People of Kodaikanal division are also mainly occupied with agricultural activities by traditional methods and very rarely by mechanical means. The source of irrigation is mainly rain, springs and river water. Other irrigation facilities like wells and bore wells are not common. The main crop grown is potato. The cereals like paddy, wheat, barley are grown to a limited extent, which doesn't satisfy the requirements of local people. Hence, the rice and other food grains are brought from outside Kodaikanal. The important crops include:-

Condiments - mustard, garlic, ginger
 Spices - Cardamom, pepper
 Vegetables - Potato, beans, cabbage, beet root,

cauliflower, noolkol, turnip, pumpkin, tapioca, lady finger, chilies etc.

Fruits - Plums, pears, peaches, apple, apricot, oranges hill banana, jack fruit, papaya, pineapple, guava, lime etc.

Whenever water facilities are abundant, potato and garlic are grown as two crops in a year.

Use of Forest & Non Forest, including seasonal patterns

In Indira Gandhi Wildlife sanctuary, the major demand before the stoppage of forestry operation and exploitation were for:-

Timber- mainly for railway sleepers, construction material

Small timber- for agricultural implements

Fuel and charcoal- for domestic consumption and cottage industries like lime, brick kilns, pottery, jaggery manufacture

Bamboo- for paper industries

Eucalyptus grandis and *Eucalyptus hybrid* for pulp & rayon industries

Lops and tops- for domestic consumption.

The main timber species in demand now and then are *Tectona grandis*, *Dalbergia latifolia*, *Terminalia paniculata*, *Terminalia tomentosa*, *Pterocarpus marsupium*, *Lagerstroemia lanceolata*, *Grewia tillaefolia*, *Adina cordifolia*, *Cordia dichostoma*, *Artocarpus integrifolia* and *Albizia odoratissima*. Due to the complete stoppage of clearfelling and selection felling of timbers since 1977, the supply of timber to the other departments and public demand is met from thinned teak plantations.

Bamboos (*Bambusa arundinacea*) had flowered gregariously in the Ulandy valley of the sanctuary from 1983 onwards and the extraction of the dead bamboos was done departmentally. This was later supplied to M/s Seshasayee Paper & Boards Ltd. Subsequently, only sporadic flowering was observed and no extraction was carried out mainly to avoid any disturbance to the forest area during bamboo working. Apart from this, cutting of the green bamboos is strictly prohibited in the sanctuary area.

Indira Gandhi Wildlife Sanctuary also has an extent of 1305 ha under Eucalyptus plantation, which has been worked in the past. Now there is no pulpwood working in these plantations which has been stopped primarily as a result of completion of the three rotation cycle and also more emphasis is given on conservation than production forestry in the recent times.

There are no fire wood coupes in the sanctuary area. For meeting the firewood demands, earlier, after the allotment of pulpwood, the rejects, lop and tops were allotted to the Sarkarpathy Hill Tribes Cooperative Society who ultimately collected and sold it in the public auction. Now after the stoppage of pulpwood working, there is acute pressure for firewood not only from the tribals but also from the Tamil Nadu Electricity Board (TNEB) colony, Elephant camp and tourist facilities at Top slip.

As already stated, pressures for NTFP collection has been reduced over a period of time which before the declaration of the sanctuary was for 58 items, slowly reduced to 5 items in the last decade and now is confined to a single item i.e. tamarind. This collection is also confined to 1 km. peripheral belt in Pollachi Range. Due to the stoppage of NTFP collection, tribals resort to clandestine collection and trade which requires suitable amelioration of the problem.

The sanctuary also faces pressures from the peripheral villages located in Pollachi, Valparai and Udumalpet

taluks in terms of fuelwood, fodder, grazing, drinking water and sometimes NTFP items.

In Dindigul forest division, following are the chief requirements and use of the forest by the local population:

Timber - Timber is required for house building purposes, making of carts and agricultural implements. The jungle woods used for building purposes are silver oak (*Grevillea robusta*), *Terminalia arjuna*, *Pterocarpus marsupium*, *Melia species*, *mango palmyrah* and *neem*. Timbers from Babul (*Acacia nilotica*), Kodaivelan (*Acacia planifrons*), Usil (*Albizia amara*), Porasu (*Chloroxylon swietenia*) and velvelam (*Acacia leucophloea*) are used for making agricultural implements.

Firewood - Firewood is in great demand due to the high prices of kerosene oil and increased use of cowdung for manuring fields. Among all the species, *Tamarind*, *Albizia amara*, *Acacia planifrons* etc. are the main fuel species. Babul (*Acacia arabica*) obtained from Tank beds is also much in demand.

Bamboos - There is a demand for Bamboos for house building and other purposes which are varied and numerous. Bamboos are extensively used for basket making and mats.

Grass - Thatching grass is in demand for roofing of the houses. Grass is also used for rope making and some times for fodder.

Grazing - Grazing is one of the most outstanding needs of local population. Goats are not allowed within the forest area but still goat browsing goes unabated.

Green leaf manure - Green leaves from the forest area are used as green manure.

Thorny and brushwood - Thorny and Brushwood species

like *Acacia latronum*, *Acacia planifrons*, *Euphorbia species* are used for fencing purposes.

Non-Timber Forest Produce - Myrobalans are used for tanning skins and hides. Mango, Nelli, Kilakoy etc. are used for the preparation of pickles. Tamarind fruits are used for culinary purposes.

In Kodaikanal forest division, the main requirements and use of the forest by the local people can be listed as under -

Firewood - Firewood is in great demand due to the high prices of kerosine oil. The requirements are partially fulfilled by fuel resources available in pattalands, unreserved and Reserved Forests. Due to rapid extension of potato cultivation and other agricultural crops, the sources of fuel supply from the private lands in the Upper Palanis have dwindled very much. The Forest Department under a new scheme at Kodaikanal to arrest the destruction of natural forests has opened firewood depots for the headloaders. Under this scheme firewood is being supplied to the poor people of low-income group, widows, aged women and those who were hitherto in the profession of collecting firewood from the forests. Under this scheme firewood is being supplied to nearly 200 persons per day. For this purpose two firewood depots are functioning.

Timber for buildings - Timber is not available in the forests of this division. For the last 10 years this division carried out no timber extraction. The timber forests are confined to small areas and mostly inaccessible areas of upper Palanis. The trees grown in a cooler climate do not serve the purpose of constructing pucca buildings. Therefore the good quality timbers are purchased from outside Kodaikanal for pucca constructions.

Small Timber - While affluent class of people use costly traditional timber from outside Kodaikanal, the

common man uses locally available species of poor quality. In the Upper Palanis, the majority of the houses have walls of wattle, date leaves and reeds, which are obtained from the Sholas of the plateau. They are intertwined and applied with mud mortar. Large sized Bluegum timber is used for inferior constructional purposes in Kodaikanal. In addition to construction of houses, people require small timber for making agricultural implements, such as ploughs, small posts, rafters and bullock carts etc. At Kodaikanal, Nelarai is used for boat making and for the manufacture of oars and purts. There is illicit removal of small timber in all the reserves adjoining habitation. Moreover the unreserves, which are subject to uncontrolled felling and indiscriminate hacking, are practically devoid of any useful tree growth.

Bamboos- Common people, who can not afford to buy traditional timber, resort to this poor man's timber, i.e. Bamboos. Bamboo is in demand for basket making also. Natural bamboo is very poor in Kodaikanal Forest Division. The local requirements are met by imported bamboo from Pollachi and Coimbatore.

Pasture facilities - The forests have always been main source of grazing. The people of this region for dairy meat and farmyard manure maintain large numbers of cattle.

The cattle population is as follows as per 1992-93 records.

Sl. No.	Name of the Cattle	Numbers
1.	Bovine cattle	13752
2.	Buffaloes	17474
3.	Sheep	1199
4.	Goats	5610
5.	Horses	2481
6.	Ass	2855
7.	Elephant	2
	Total	42174

There has been an alarming increase in the number of cattle that graze in the forests. The Forest Department allows grazing in the Reserved Forests with grazing permit system. Continuous and excessive grazing has caused soil erosion.

Cattle fodder and grass for thatching - The people of Kodaikanal region are allowed to remove all types of grass free of charge for domestic use and as fodder grass. To some extent, this provision to the public prevents the fire occurrences since the grass poses severe fire hazard to the forests during dry season.

Land for cultivation of hill banana, coffee etc- The land of this hills has got a huge demand for cultivation of coffee and hill bananas. Large areas surrounded by Reserved Forests of this division were left as enclosures at the time of forest settlement to meet the local land demand of the existing villagers. The villagers got well settled and have handsome yield from the above crops.

Non-timber forest produce - The main non-timber forest produce in demand is tan material i.e., Wattle bark, Konnal and Avaram barks, Myrobalams etc. These are used for tanning skins and hides. Other important Non Timber Forest Produce are Tamarind, Seekakai, Kapok, Thatch grass, honey and wax. Except honey and wax, all other items are exploited by the agency of contractors.

Raw Materials and Forest Based Industries

Raw materials - One of the main functions of this division is the supply of raw materials to the forest based industries. The following are the main raw materials supplied to the forest based industries.

1. Wattle bark
2. Wattle pulpwood
3. Bluegum pulpwood and smaller extent of Eucalyptus grandis, pulpwood.
4. Pine wood
5. Blue gum leaves

Details of forest-based industries are as follows -

Wattle bark based industries -

1. Tan India Wattle extracts company limited
2. Anbu Wattle extracts limited
3. Siva Tannery Industries limited

Pulpwood based industries -

1. The South India Viscose company limited
2. Seshasayee Paper and Board limited
3. Tamil Nadu Newsprint and paper limited

Leaf based industries - There is handsome revenue realized from the sale of the bluegum leaves. Eucalyptus oil is extracted from these leaves. Eucalyptus oil distillation is running like a cottage industry in Kodaikanal division. These industries also provide works to the labourers of this area and also to migrated people in search of daily work.

4.3 Implications of Land Use and Resource Dependency

The working of fuel coupes and the dependency of the people on the forests in terms of timber, fodder and NTFP has resulted in the depletion of tree cover in the outer slopes of Anamalai Sanctuary particularly in Pollachi, Udumalpet and Amaravati areas leading to habitat degradation and soil erosion. Cultivation of crops like sugarcane, coconut, tamarind, mango, etc in the lower reaches and banana, jackfruit etc in the upper reaches have also resulted in the movement of elephants during fruiting season for the above species thus resulting in crop damage and also man-wildlife conflict. There have been frequent reports of elephants damaging the crops in Valparai, Udumalpet and Aliyar areas. Similarly, livestock depredation and man-animal conflict have been reported in respect of leopards and this is more frequent in tea estates of Valparai.

A serious implication of resource dependency leads

to loss of biological diversity through species extinction, but the same is least in Anamalais. There has not been much of habitat destruction but in areas where habitat has been destroyed weeds like *Lantana*, *Parthenium* and *Eupatorium* have invaded. Places close to elephant camp and tribal settlements exhibit acute weed infestation. Even the diversion of land for hydel projects and tea, coffee, cardamom estates in Valparai plateau has led to the fragmentation of the tropical evergreen forests. The migratory paths and corridors of the elephant have been cut in few places in Valparai region forcing the elephants to move through the private tea gardens. Forest cover in many of the private estates has been lost over a period of time due to the expansion of plantation crops like tea, coffee and cardamom especially in Valparai and Manamboly areas of the sanctuary. It has also been reported that the lion tailed macaque (*Macaca silenus*) which is primarily an arboreal species, is currently endangered due to the habitat loss and fragmentation especially in Valparai plateau. Similar fate is also expected for another endemic primate i.e. Nilgiri langur (*Presbytis*

entellus). Some of the private estates in Valparai region like Puduthottam and Analy harbour excellent evergreen forests and have been subjected to the maximum habitat destruction due to conversion of area into plantation crops. Grizzled giant squirrel (*Ratufa macroura*) has become restricted to the riverine patch near Amaravati Crocodile farm and Chinnar check post area and any further manipulation may lead to the elimination of the species from the area.

Presence of the 36 tribal settlements inside the protected area imposes direct conflict with the wild animals and illicit collection of NTFP deprives the wildlife of its critical diet. Currently, only one NTFP i.e. Tamarind fruit is allowed for collection in the 1 Km. peripheral belt of Pollachi Range through Tribal cooperative society and it has been observed that the summer season of Feb-March, when the tamarind fruits are collected, elephants tend to congregate in such tamarind rich patches for feeding on the same.

Table 4.6 - Shows the possible implications of the land use and resource dependency in the conservation area.

Problems	Impacts
I. Agriculture and Conversion	
A) Tea, Coffee, Cardamom in higher areas coconut and mango in lower areas	1. Corridor outside RF- Broken and Forest Fragmented
B) Frequent conversion of Crops - Change land use pattern	2. Buffer area reduced
C) Weed growth-Eupatorium, Parthenium and Lantanas	3. Increase in man wildlife conflicts
	4. Soil erosion
II. Hydel and Irrigation Projects Cum Enclosures	
A) Highways within Protected areas	5. Change in drainage pattern
	6. Reduces water table
	7. Suppresses natural growth
B) Private estate and holdings with in PAs and their activities	8. Species diversity loss
	9. Ecological disturbances
III. Tribal Activities	
A) Land development and cultivation	1. Fragmentation
B) Lemon grass and cultivation	2. Break in Wildlife corridor
C) Grazing and penning	3. Law and order problems in RFs
D) Man made fires	4. Loss of under cover and depletion of wild genes
E) Support to outside clandestine activities	5. Loss of Micro flora and fauna
	6. Change in behaviour of Wildlife and their migratory pattern

4.4 Forest Management Practices and their Implications for People

The forest economy and tribal economy are complementary to each other. The employment generated by forestry sector by thinnings and other silvicultural operations, fire protection measures, development and protection activities has potential to provide tribals with work for about 4-5 months. Numerous actions have been undertaken in the sanctuary as a habitat improvement and forest development activity and also as a measure to improve the socio-economic condition of tribals without much detrimental impact on the adjoining forest.

In the past, local people were employed in the various forestry operations like teak, eucalyptus, bamboo & firewood harvesting including non-timber forest produce collection but after the declaration of area as sanctuary, management plan prescriptions have suggested to keep the protected area out of the purview of any industrial exploitation. Initially, exploitation of all industrial plantations were restricted to the peripheral areas with thinning of teak as per the working plan prescriptions but the same has been done so as to favour wildlife conservation. Thinning of teak or canopy manipulation has been resorted keeping consideration for wildlife habitat in select areas only on a very small scale whereas working in eucalyptus area has been totally stopped after the harvest of the 3rd rotation crop. In the lower reaches, eucalyptus plantation has also resulted in the invasion of *Prosopis juliflora*, which occupies large tracts in Pollachi range. Even the stoppage of bamboo working due to sporadic flowering and reduction of NTFP lease to single tamarind unit has also resulted in the loss of employment opportunities for the local tribals.

The current emphasis of the Forest Deptt. is to undertake various habitat related and protection activities by involving local people, which not only ameliorates or protects the habitat but also provides employment to the local tribals. A remarkable step, which has been undertaken in this direction, is the recruitment of Forest watchers in the sanctuary area

only from these 36 tribal settlements. Limited tribal development activities have also been undertaken at a cost of Rs. 3.00 crore under Innovative Jawahar Rozgar Yojna (IJRY) towards 4 components.

- ? Provision of dwelling huts
- ? Land development activities
- ? Drinking water supply
- ? Approach Road

All the activities undertaken under the programme is aimed to provide bare minimum basic amenities within these settlements without causing any detrimental impact outside.

Outside the Protected area in the peripheral zones of Anamalai and also in Dindigul and Kodaikanal Division, critical villages have been identified under Tamil Nadu Afforestation Project (TAP) in which, on the principles of joint forest management (JFM), degraded forest areas are being tackled in terms of afforestation, soil & moisture conservation measures and various buffer zone activities. Aims of this project is to ensure that the degraded forests are first protected from any grazing, fire and illicit firewood collection and subsequently ameliorated by undertaking planting and soil moisture conservation measures. This would also ensure not only enrichment of the ground water table in the vicinity but also providing of drinking water from the constructed check dams. Buffer zone activities undertaken in this programme directly benefits villages in creation of the community assets and development of various alternatives so as to reduce the pressures on the adjoining forests.

In private tea and coffee estates of Valparai plateau, currently *Prosopis juliflora* wood is being transported as firewood for the factories which has also resulted in the price rise of the same in the local market. Though captive plantations of eucalyptus are available in these estates for firewood purposes but the estate authorities prefer to sell the same as timber in the local market and outside resulting in the market fluctuations in terms of price of both firewood and eucalyptus timber including that of Silver oak which

is extracted as a shade regulation crop in these estates.

In Kodaikanal division forest deptt. is meeting the requirements of firewood from the fire depots, which are functioning as a result of thinned material from the wattle plantations. Till recently, all the Wattle bark and Pulpwood industries were working in these areas for extracting wattle and pulpwood and the lops and tops were available as firewood, but with the stoppage of these industries, Forest Deptt. has ensured that there is continued supply of firewood for the local people by undertaking of these thinning operations.

Besides regular forestry management practices, film shooting, development of ecotourism and pilgrimage is coming as a critical management consideration which has direct implications with the local people in terms of their employment opportunities and development. We do have incidences of lopsided tourism in the sanctuary area where there is intense pressure for Top slip region or request for opening up the sensitive tracts of Grass Hill and Manamboly for not only tourism but also for film shooting. Similarly, seasonal influx may be seen due to the pilgrimage in the area. All these activities do provide ample scope for employment for the local people but at the cost of conservation. Steps so far undertaken by the deptt. has ensured that such disturbances do not cause any serious impact on wildlife or on fragile ecological zones like Grass hills in Anamalai or Berijam Lake in Kodaikanal.

4.5 Development of Programmes and Conservation Issues

There have been conflicting and lopsided development approaches by various Govt. agencies with regard to tribal development. For example, goat grazing is banned in all RF's and sanctuary area but Animal husbandry and Rural development deptts. have resorted to giving of loans for goat and sheep rearing. Similarly, collection of lemon grass is not permitted from the protected area, but instances of loan for lemon grass cultivation and distillation are present.

Anamalai Conservation Area in general and the protected area in particular face various conservation threats, which needs to be borne in mind before any development programme is envisaged.

1. Threat of Habitat fragmentation

a) Developmental projects - Though, the ACA happens to be a relatively large habitat area but numerous hydel and irrigation projects like Parambikulam-Aliyar has been the main deterrent for conservation of the species like elephant. Also, penstock pipes along the steep slopes from the Sholayar reservoir and contour canal from Sarkarpathi to Thirumoorthy hills have fragmented the habitat at various places.

b) Tea & Coffee estates - The conversion of central Valparai plateau into tea, coffee and cardamom estate has cut down the migratory paths of the elephants and has also contributed to increased man-animal conflict in the area.

c) Settlement & Villages - Presence of the villages and settlements in the ACA also contribute to the habitat fragmentation as the traditional migratory routes and paths of the animals have been brought under cultivation.

2. Habitat Degradation

Extensive transformation of the natural forests to teak and eucalyptus plantations in the lower reaches and wattle and pine plantations in upper reaches of the ACA has destroyed the indigenous habitat of the area. These are often infested with the weeds such as Lantana, and Eupatorium and these have also resulted into the loss of grassland areas.

3. Man-animal conflict

Conflict is largely confined to the Valparai region, where elephants regularly traverse the tea estate and we do come across some cases of man- slaughter.

4. Crop depredation

Crop depredation is quite common especially in male elephants and wild pigs. Reports indicate that crop raids by the elephants in the ACA is as under -

Indira Gandhi Wildlife Sanctuary - 14/Year
Dindigul Division - 18/Year
Kodaikanal Division - 12/Year

Crop depredation due to the wild pigs is quite high especially in the upper reaches of the ACA.

5. Faulty land use pattern

Frequent conversion of crops and changed land use from tree crop to horticulture crop and finally to agriculture has not only led to habitat degradation but has also contributed to soil erosion. In the upper reaches of Valparai, tendency in the private estates is to convert the existing natural forests and tree plantation to tea, coffee & cardamom crops. Even instances of conversion of coffee areas (having more shade trees) to tea crop are quite common in this region. In the peripheral areas outside the Protected area, coconut and mango is being taken up in the traditional agriculture areas because of better economic returns.

6. Grazing & Penning

Due to the absence of community grazing grounds, pressures of the grazing is quite high in the lower elevations as compared to the upper reaches of the ACA. Cattle penning which used to be in vogue in Indira Gandhi Wildlife Sanctuary and which used to cause severe damage in the interior areas has been stopped very recently due to the High Court's intervention but uncontrolled grazing of the cattle in the lower reaches always pose threat to wildlife.

7. Poaching

Organized wildlife poaching is definitely not a serious concern but connivance and clandestine involvement of the tribal settlement people has been observed in not many cases in the sanctuary area. Poaching for wildlife meat has been reported in the peripheral areas of the sanctuary as well as crop raiding animals like wild pigs are also often killed.

8. Fire

Majority of fires are man made in the ACA which can be attributed to various causative factors like

collection of NTFP, grazing, poaching, presence of estates, tourists and pilgrims visiting the area, sabotage by local tribals to get employment during fire season etc. Fire problem is quite serious in the upper reaches of Valparai, Palani hills and Kodaikanal division where grasslands and wattle /pine plantations are quite susceptible to fires. Similarly, dry deciduous forests in the lower reaches of Indira Gandhi Wildlife Sanctuary and Dindigul division also face severe fires due to dry teak leaf litter and other accumulated combustible material.

9. NTFP Collection

Consequent to the stoppage of all NTFP collection excepting 'Tamarind' in Indira Gandhi Wildlife Sanctuary, there is intense pressure for illicit collection of many NTFP's, which were collected in the past. Even the Sarkarpathi Hill Tribes Cooperative Society, Pollachi has not been able to meet the objectives of the cooperative society in uplifting the livelihood of the tribals in the region. The society excepting for providing employment to the tribals of select settlements in the season has not been able to take up any community development works. Very often, we observe situations of conflict occurring with the wildlife due to the illicit collection of NTFP especially mauling by bear.

10. Lopsided Tourism

Tourism in the area doesn't conform to the principles of Ecotourism. Most of the visitors coming to the protected area or ecological spots in the ACA do not have serious concern for the forests and wildlife but primarily want to have merry-making and picnic in the area. This not only becomes a serious impediment for the forest and wildlife conservation but also puts intense pressure on the skeletal staff of the area. Similar threats are also due to the film shooting in the area and there is always pressure for opening up of the fragile areas for tourism and film shooting.

11. Pilgrimage

Various areas in Indira Gandhi Wildlife Sanctuary and Dindigul division experience the pilgrimage pressure in different parts of the year. This imposes serious

habitat threat in terms of removal of fuelwood, NTFP's and causing of litter in the area.

12. Ganja Cultivation

Many areas in Indira Gandhi Wildlife Sanctuary like Manjampatti area, High Forest and Cinchona area in Valparai, upper Kurumalai in Udumalpet, Palani range in Dindigul, Kukkal and Khilnavayal area of Kodaikanal are susceptible to ganja (*Cannabis indica*) cultivation. The cultivators take the advantage of inaccessible areas and steep slopes and undertake small clearings in dense forest patches and thus destroying the habitat.

To tackle the conservation issues, various schemes / programmes have been implemented with the aim at habitat improvement and management, forest and wildlife protection, tribal development, ecotourism development etc.

Some of the schemes under implementation in ACA are -

- ? Western Ghat Development Programme
- ? Development of Sanctuary & National Park
- ? Nature Conservation
- ? Project Elephant
- ? Forest Protection & Forest Consolidation
- ? Ecodevelopment
- ? Decentralised District plan
- ? Innovative Jawahar Rozgar Yojna
- ? Tamil Nadu Afforestation Project
- ? Pulpwood scheme & fuelwood scheme

4.6 Evaluation of Government and Non- Govt. Programmes for Development - Implications for CA & People Within

The various Govt. programmes have undoubtedly helped in the protection and conservation of forests but non-availability of the requisite financial assistance and infrastructure inadequacies have hampered the sustained overall development in the conservation area. The schemes have helped in the marginal improvement of the tribal lands and have also helped

in the habitat improvement of the region but it has not brought any appreciable change in the attitude of the tribals in the settlement and their socio-economic structure. Lack of quality seeds and agricultural implements, poor agricultural practices, inadequate infrastructure, improper marketing facilities and lack of road have resulted in the poor agriculture yield, not sufficient to feed everyone in the settlement. Therefore, the tribals also undertake seasonal employment mostly with the forest deptt. as animal trackers, fire watchers, anti poaching watchers, eco-guides etc. They also sometimes get temporary employment in estates or in private lands. The tribals within forests are even today in pursuit of more lands for larger agricultural gains, which may not be any where in the vicinity due to their unskilled and crude agricultural practices and increasing population pressure. The tribal lands are also subjected to the wildlife attack viz. wildpigs, elephants, deer etc. which to a great extent has been ameliorated by the digging of elephant proof trench around the settlement land.

In Indira Gandhi Wildlife Sanctuary, a Rs. 3.00 crore tribal development programme viz. Innovative Jawahar Rozgar Yojna (IJRY) has been implemented in 36 settlements from 1996 - 2000 and it has yielded the desired dividends in terms of tribal development as well as reduction of the biotic pressures on the adjoining forests. Besides providing of the improved dwelling facilities with the zinc sheet roofing, drinking water facilities in the form of open well, bore well, check dam etc. were provided in all the settlements. Approach paths for all the settlements were developed which could be used even in the monsoon season. Land development included in terms of development of EPT so as to afford protection from the wildlife damage, supply of agricultural implements and better quality seeds, horticultural and fruit bearing plants, irrigation facilities, contour bunding and terracing in the hilly areas etc.

Many other deptts. like Adi-dravida & Tribal Welfare Deptt. Cardamom boards etc. have also attempted at the tribal development works but could not succeed

due to the non-involvement of the forest deptt. and improper monitoring of the programme. There has been absolutely no support from the NGO's in the tract. Some NGO's did enter the sanctuary area without involving the Forest deptt. and did attempt for certain tribal development works but couldn't make much headway.

The people in the plains and those living outside the sanctuary area and within the zone of influence, do not have great dependency on the protected area, as the Parambikulum-Aliyar Project scheme has assured them with sustained water supply, thereby, their agricultural economy has been boosted and lands brought under better productivity. Further, the land holdings are mostly large and therefore, interface area is substantially free from acute biotic pressures.

Since 1997, Tamil Nadu Forest Deptt. has adopted Rs. 500 crore Japanese aided Tamil Nadu Afforestation Project (TAP). All the villages close to the degraded forest areas in Pollachi, Dindigul and Kodaikanal divisions have been included under this scheme on the principles of JFM. Significant achievement could be observed as a result of implementation of TAP in amelioration of the habitat, adjoining degraded forests, reduction in fire incidences and grazing, improvement of soil-moisture conservation and buffer zone activities leading to development of alternatives.

In Kodaikanal division, fuelwood scheme ensures the thinning of wattle plantations and in turn making available the firewood in the firewood depots. The response of the firewood depots has been extremely encouraging and has protected the native sholas from being felled.

The ongoing wildlife and forest protection as well as various conservation & development schemes in the ACA have helped in the forest and wildlife protection as well as habitat amelioration but the limited and untimely release of funds could not saturate all the watersheds and ensure all round development of the conservation area.

The only Non-Govt. program which has been successful in the conservation area is on the medicinal plants. An NGO based at Bangalore-Foundation for Revitalization of Local Health Traditions (FRLHT) has identified medicinal plant conservation areas (MPCA) in the ACA and demonstration plots have been developed. The local people have been involved in identification of the various uses of the medicinal plant parts and encouragement has been given to the local 'hakims' and 'vaid's under this programme. The focus of the second phase of this programme is on medicinal plant development areas (MPDA), which envisage development of the nursery and extension of the use of medicinal plants.

4.7 Inter Play of Market Forces and their Impact on Subsistence Economy of Local People

Tribals of Indira Gandhi Wildlife sanctuary sometimes market their land agricultural products through the Hill Tribes Cooperative society in which most of the settlement people are members. The two societies viz. Sarkarpathy & Tunacadavu Hill Tribes cooperative societies have not played the desired role in tribal development. The prime reason could be keeping at bay the forest officials from the administration and functioning of these societies, thus, not being able to develop and plan the marketing strategy of their products. Moreover, the interest of both the societies is not towards tribal development but in generating that much of work so as to ensure the sustenance and salary of the staff of these societies. Focus of the Sarkarpathi society is in getting NTFP lease whereas that of Tunacadavu is in supply of the provisions for the elephant camp at Top slip and also running a provision shop for the staff and residents of the area. All the 36 tribal settlements are situated in the far-flung areas where it is not possible for these Hill Tribe Societies to have effective contact. Moreover, the productivity from the land is so less that so far, it has not been possible for these settlements to plan any effective marketing strategy. Also, most of the households are in various degrees of debt and hence are forced to sell their produce to the contractors at a

very low rate. Besides private estate authorities engage the tribals in Manamboly and Valparai Range for pollarding and pruning of shade trees and some of the tribals in Ulandy range are engaged in thinning operation and transport of timber either at Topslip or Parambikulam. .

The agriculture economy in plains, have ensured income for the landholders and wages for the labourers. Most of the landholdings in the plains are today under coconut, mango, lemon etc. Industrial development in Coimbatore and hosiery business in Tiruppur has attracted many labourers from these areas in search of employment. Thus there exists labour scarcity in this region which is also one of the reasons for the shifting of agricultural pattern from annual crop like paddy, groundnut, sugarcane etc. to coconut.

In the hilly regions of Valparai, most of the estates grow tea, coffee and cardamom and in majority of the estates, Sri Lankan repatriates have been settled as labour force. Here again, international prices of the tea and other cash crops determine the economy of the people in the region. Community development activities are undertaken by the estates only if the concerned company is doing well and making profit. For shade regulation in these plantations, certain local employment opportunities are created from time to time.

In Kodaikanal division, the importance of the division is chiefly due to its production of wattle bark, wattle and bluegum wood, pine wood, Eucalyptus grandis wood, eucalyptus oil and other non timber forest produce.

Wattle bark - Wattle bark from the wattle plantations of Kodaikanal forest division is allotted to the forest based industries viz. Tan India (Mettupalayam) Anbumani Wattle extracts company (Gobichettipalayam) and Siva tanneries (Dindigul).

Pulpwood - Wattle wood, Bluegum wood, Pine wood and Eucalytus grandis wood from the plantations of the Kodaikanal forest division till very recently were

allotted to the South India Viscose company for Rayon pulp and paper (Sirumugai), Tamil Nadu Newsprint limited (Tiruchi Pugalur) and Sheshasayee Paper and Boards limited (Erode).

Eucalyptus oil - There is appreciable demand for bluegum leaves for the distillation of Eucalyptus oil. It is an established cottage industry in and around Kodaikanal. Small units do the distillation in a crude manner and low quality oil is obtained.

Geranium oil - This oil was distilled departmentally from the species *Pelargonium graveslensis* and sold in public auction and mainly used in perfume making industries. Now there is no departmental activity regarding Geranium oil.

Cardamom - It is an important spice cultivated by the lessee in the forest area. The local market for this produce is Bodi. It is exported to foreign countries also. No new areas are leased out at present. The forest department has resumed the old leases that had expired. All existing lease units have been cancelled and attached to the respective reserve forests.

Gallnut (*Terminalia chebula*)- Gallnut is considered as most important Myrobalam used in Leather Industry to tan the material. It is also well known for its medicinal value used in native medicines as well as Ayurvedic medicines. Dindigul is the main market place in Tamil Nadu and retail market is at Madras.

Most of the Non-Timber Forest produces are sold in public auction to the agency of contractor once in a year and the produce is also consumed locally.

Dindigul Division has no marketable forest produces except Non-Timber Forest Produce including Kadukkai and Silk cotton. No timber operation or fuelwood coupe is being worked. However, timber is harvested from private lands, after getting permission from the District Committee under T.N.H.A. (P.T) Act. Important Non-Timber Forest Produces harvested include Tamarind, Silk Cotton, Kadukkai, Bodhai Grass.

4.8 Summary of Problems Faced by People that Affect the CA Management (Forest & Agricultural Areas)

The life pattern of the tribals living in the settlements of the protected area can be divided into 2 parts-

- i. Pattern before the declaration of the area as sanctuary
- ii. Pattern after the declaration of the area as sanctuary

Before the declaration, tribals were allotted with definite areas for cultivation & they used to cultivate millets and tubers by shifting cultivation method. They were also employed with the Forest deptt. in various timber and thinning operations and also used to collect NTFP throughout the year. In addition, some of the tribals used to graze the cattle of landlords from the plains in hundreds after issue of the penning license from the department and these cattle were left with the tribals for grazing in their settlements for months together.

With the declaration of the area as sanctuary, the forestry operations were drastically reduced. The NTFP collection was reduced to fewer items and now is reduced to one, i.e., tamarind. The restriction on shifting cultivation made them resort to lemon grass cultivation in their settlements for oil distillation and this also acted as a potential source for forest fire as the grass was burnt in the months of Mar-April for fresh flush. The lemon grass distillation in their settlements also attracted antisocial elements in the garb of being purchaser and the innocent tribals were also induced for helping these outsiders in ganja cultivation. With the enforcement of Wildlife Protection (Amendment) Act 1991, all forestry operations including NTFP collection have since been stopped excepting one tamarind unit and thus it has thrown most of the tribals out of employment. Agriculture practices and methods followed by these tribals are quite primitive, yield is very low and there

are no proper marketing facilities. Many of the men, women and children suffer from under nourishment and lack of basic facilities.

Their rich traditions and social taboos have embedded them to these settlements.

Many of the tribal settlements like Thalinsi, Mavadappu, Kurumalai & Kullipatti pose great threats to wildlife. Their agricultural areas were extending gradually which now has been controlled by digging of the EPT all around the settlement. Many tribals from these settlements have established links with the ganja cultivators, sandalwood smugglers and other anti-social elements. Outsiders from plains have also married tribal women in some settlements for gain and access into the forest area.

Even the tribal women and children in various settlements are a neglected lot. They spend most of their time in cooking, collecting fuelwood, drinking water etc. Deterioration of the habitat around the settlements may be attributed to them. The women are also engaged in primitive agriculture practices in their lands whereas children are sent for the collection of NTFP's etc. Considering the plight of tribals of Anamalais, Innovative Jawahar Rozgar Yojna (IJRY) was envisaged in 1996-97 and certain basic amenities were provided to most of the settlements in terms of housing, drinking water, land development and approach road. The Tribal Residential school at Top slip was further strengthened to ensure more children were admitted in the school. Penning of the cattle was banned to safeguard the habitat from destruction and youth were provided training in alternative vocation under TRYSEM scheme. In the peripheral areas, the ACA faces pressures in terms of fuelwood, fodder, grazing, drinking water and NTFP items from the villages, which are located just outside. These pressures in the ACA are currently being tackled under Tamil Nadu Afforestation Project (TAP) on JFM principle. The Estate labourers of Tea, Coffee & Cardamom as well as TNEB Hydel project colony, which needs to be effectively checked and monitored, impose similar pressures of fuelwood and grazing.

In the agricultural areas outside the ACA, villagers face the brunt of crop damage by wildlife especially elephant, wild pigs, gaur, deer etc. Peripheral areas of Indira Gandhi Wildlife Sanctuary and both Kodaikanal and Dindigul divisions face such crop raids, which is quite high in Dindigul and Anamalai areas. As regards to the elephants, Forest Deptt as well as local people have erected electric fencing in the critical areas along with EPT in certain zones but still damage due to the wildpigs has not been controlled. Various habitat improvement works have been carried out to check the movement of these animals outside in the agricultural fields but with less degree of success.

4.9 Social and Economic Issues, Concerns and Implications

Various social and economic issues and concerns can be summarized as follows -

1. Dynamic increase in the population over a period of time leading to increased biotic pressures on the habitat.
2. Expansion of the settlement area in order to have more area under cultivation and thus reduction of the forest cover.
3. Drastic change in the social customs and traditions as a result of outside exposure and marriage with the outsiders (non tribals) who have gained access to the forest area.
4. Lack of basic amenities like dwelling huts, drinking water etc.
5. Lack of employment as a consequence of closure of forestry operations like timber felling, thinning etc.
6. Stoppage of NTFP collection consequent to declaration of the area as protected area leading to the loss of employment.
7. Practice of primitive type of agriculture and low productivity of the land making their lives extremely difficult in the tribal settlement.
8. Lack of marketing facilities for their agricultural produce and operation of the middlemen / contractor eating away their profit.
9. Faulty landuse practice and conversion of land with tree cover to horticulture / agriculture in the upper reaches leading to accelerated soil erosion and loss of forest cover.
10. Demand for the timber, small timber, fuelwood, fodder and other NTFP's in the settlements and villages within and outside the protected area.
11. Lack of educational facilities in the settlements and absence of any commitment on part of the tribal people for getting themselves educated and joining of the tribal residential school.
12. Lack of nutritional facilities and under-nourishment in the tribal people including lack of medication in the settlements.
13. Grazing of the village cattle in the forest areas leading to habitat degradation including competition for water sources with the wildlife and possible spread of any communicable disease.
14. Livestock and crop depredation in the villages by the wild animals and non-settlement of the timely and adequate compensation.
15. Man-animal conflict due to movement of the villages and tribals in the forest area or due to the cultivation / development in the migratory path or due to the straying of animals.
16. Pressures of pilgrimage in the area leading to habitat destruction and increased biotic pressures.

Appendix - 4.1 List of Useful Plants

S. No.	Latin Name	Produce Name	Part used	Dir/indir	Animals affected
1	<i>Ficus glomerata</i>	Athikai	Fruits	DIR	Hornbills other birds Small Mammals
2	<i>Cassia auriculata</i>	Avaram bark	Bark	IND	
3	<i>Apis dorsata, mellifera, indica</i>	Bees wax		IND	Sloth bear & Plant pollination
4	<i>Canarium strictum</i>	Black Dammer	Gum	IND	Hornbills
5	<i>Eleteria cardomom</i>	Cardomom	Fruits	DIR	Birds & Small mammals
6	<i>Strychnespotatorum sp.</i>	Thethankottai	Seeds		
7	<i>Murrayya koenigi</i>	Curry Leaves	Leaves	IND	Birds & Small mammals
8		Deer Horns		DIR	Rodents eg. Porcupine
9		Cut stones		DIR	Disturbance
10	<i>Phoenix acaulis</i>	Eachum grass	Leaves		
11	<i>Phoenix silvestris</i>	Echam palam	Fruits	DIR	Frugivores
12	<i>Rhauwoulfia serpentina</i>	Eiya kundu	Roots		
13	<i>Zizyphus mauritiana</i>	Elandai	Fruits	DIR	Birds & mammals
14	<i>Several sp.</i>	Fodder grass	Leaves	DIR	Herbivores
15	<i>Terminalia bellerica</i>	Gallnut	Fruits	DIR	Squirrels & Birds
16		Gravel			
17	<i>Zingiber officinalis</i>	Ginger	Tubers	DIR	Wild boar & Porcupine
18	<i>Zyzyphus numularia</i>	Elandai	Fruits	DIR	Sloth bear, Barking deer, Langurs and other animals
19	<i>Apis dorsata, A. Mellifera, indica</i>	Honey		DIR	Sloth bear & Plant pollination
20	<i>Asparagus indicus</i>	Sivanar	Leaves		
21	<i>Acacia instia</i>	Indukkodi	Bark	DIR	Elephant
22	<i>Acacia instia</i>	Indunar	Fibre	DIR	Elephant
23		Ivory	Ivory	DIR	Porcupine
24	<i>Opuntia sp.</i>	Kalli	Stem		
25	<i>Bauhinia vahlii</i>	Kattu mandarai	Leaves		
26	<i>Pinanga dicksoni</i>	Kana-Kamuku	Leaves Fruits	DIR	Elephant
27	<i>Psidium gujava</i>	Koyya	Fruits	DIR	Birds and other frugivores
28	<i>Myrisytica sp.</i>	Jathikai	Fruits	DIR	LTM & Birds
29	<i>Pandanus tectorius</i>	Thazambu	Flowers		
30	<i>Carrisa caranda</i>	Kilakkai	Fruits		
31	<i>Cassia fistula</i>	Konnai patta	Bark		
32	<i>Celastrus paniculata</i>	Valaluvai	Seeds		
33	<i>Abrus precatorius</i>	Kundumani	Seeds	DIR	Small mammals
34	<i>Curcuma aungustifolia</i>	Koovai	Tubers	DIR	Wild boar & Porcupine
35	<i>Cyperus rotandus</i>	Korai grass	Stem	IND	Birds and Mammals
36	<i>Cinnamomum Breyia.</i>	<i>zylanicum</i> Lavangum	Bark	IND	Birds

Contd...

37	<i>Citrus medica</i>	Elimichai	Fruits	DIR	Frugivores
38	<i>Citrus aurantium</i>	Orange	Fruits	DIR	Frugivores
39	<i>Coffea arabica</i>	Coffee	Seeds	DIR	Hornbills and other animals
40	<i>Cymbopogon sp.</i>	Lemon Grass	Leaves and stem		
41	<i>Gymnema montanum</i>	Mahali kilangu	Root tuber	DIR	Wild boar & Porcupine
42	<i>Helecteres isora</i>	Valampiri	Fruits		
43	<i>Madhuca indica</i>	Mohua	Flowers & Fruits	& DIR	Birds and Mammals
44	<i>Hemidesmus indicus (L) R. Br.</i>	Nannariver	Roots	DIR	Wild boar & Porcupine
45	<i>Hiptage madablota</i>	Karunkodi	Creepers		
46	<i>Azadirachta indica</i>	Neems	Seeds	DIR	Birds and small mammals
47	<i>Strychnos nuxvomica Linn.</i>	Nuxvomica	Seeds	DIR	Birds and small mammals
48	<i>Hippocraten indica</i>	Odean kodi	Stem		
49	<i>Husepa radisica</i>	Velaelai	Leaves		
50	<i>Jatropha curcas</i>	Kattamankku	Seeds		
51	<i>Lepisanthes tetraphylla</i>	Neikotton	Seeds		
52	<i>Trichosanthes Cucumerina.</i>	Peypodal	Fruits		
53	<i>Musa sp.</i>	Plantain leaves	Leaves		
54	<i>Pongamia pinnata</i>	Opungam seeds	Seeds	DIR	Squirrels
55	<i>Calamus sp.</i>	Rattan	Stem	DIR	Elephant
56	<i>Sapindus emarginata Vahl.</i>	Soapnut	Fruits	DIR	Birds and small mammals
57	<i>Semicarpus anacardium</i>	Senkottai	Fruits		
58	<i>Acacia concinna DC.</i>	Shekkoy	Fruits	DIR	Squirrels
59	<i>Acacia arabica</i>	Karuvelum	Gum		
60	<i>Tamerindus indica Linn.</i>	Tamarind	Fruits	DIR	Grizzled & Malabar Giant squirrels
61	<i>Entada phasioloides</i>	Thilukai	Seeds	DIR	Rodents
62	<i>Terminalia bellerica or</i>	Taanikai	Fruits	DIR	Flying Squirrels and birds
63	<i>Tinospora cordifolia</i>	Sinthukodi	Ful plant		
64	<i>Beleric myrobolam</i>				
65	<i>Curcuma longa</i>	Turmeric	Tubers	DIR	Wild boar & Porcupine
66	<i>Ventilago maderaspetana Gaertn.</i>	Vmbodami	Bark		
67	<i>Vateria indica Thw.</i>	Vellakungilium	Gum	IND	Hornbills and squirrels
68	<i>Solanum nigrum and</i>	Wild Brinjal	Fruits		
69	<i>Solanum pubescens</i>	Wild Brinjal	Fruits		
70	<i>Artocarpus heterophyllus</i>	Wild Jack	Fruits	DIR	LTM, Birds and Mammals
71	<i>Solanum tuberosum</i>	Sundakoy	Fruits		
72	<i>Solanum berbsritolium</i>	Mullikoy	Fruits		
73	<i>Mangifera indica L.</i>	Wild Mangoes	Fruits	DIR	LTM, Flying squirrels, Birds & other mammals
74	<i>Piper longum</i>	Wild peper	Fruits	DIR	Birds and small mammals
75	<i>Plumbago zeylanica</i>	Koduveli	Roots	DIR	Wild boar & Porcupine
76	<i>Feronia lemonia</i>	Wood apple	Fruits	DIR	Rodents
77	<i>Mallotus phillipensis</i>	Koilpottur/ Karupodi	Seeds		

Chapter 5

Conclusion and Management Implications

5.1 Key Issues and Opportunities Identified in the Analysis

The Conservation issues and concerns, which have critical bearing in the management of the Anamalai Conservation Area, could be grouped as under:

Habitat related - includes habitat fragmentation and degradation, fire, grazing, NTFP collection etc.

Species related - includes problem of isolated herd, veterinary care, wildlife health and diseases etc.

Management related - includes wildlife poaching, man-animal conflict, crop & livestock depredation, enclave settlements, lopsided tourism, pilgrimage pressure, ganja cultivation, developmental projects especially hydel projects, mining leases etc.

Administrative & Legal - infrastructure constraints, vacancy of frontline staff, lack of coordination with the line departments and other agencies, lack of training and trained staff, weakness of the Wildlife Protection Act, delayed justice, lack of political / people's support, financial constraints etc.

a) Key Stressors

The key stressors in respect of Anamalai Conservation Area are primarily those factors which are responsible for habitat related threats like hydel and irrigation projects, tea/ coffee/ cardamom estates, tribal settlements and other cultivations etc. These factors

are responsible for the fragmentation and degradation of the habitat, invasion of weeds and exotics, fire and other related biotic pressures in the region. Coupled with the fragmented habitat, crop depredation and man-wildlife conflict as a result of movement of animals in the adjoining field also happens to be a key stressor in the region. Presence of settlements and highly forest dependent villages within the Conservation Area pose pressures of NTFP collection and grazing which also happens to be the traditional life style of the people in the ACA. As the Indira Gandhi Wildlife Sanctuary abuts the adjoining state of Kerala, poaching of elephants for tusk, ganja (narcotics) cultivation and illicit removal of sandalwood also happens to be a critical factor in the area.

Details of the key stressors is as follows –

Hydro electric & irrigation project - A series of dams, canals, penstock pipes and stationing of the power stations within the ACA in the recent times has cut the traditional migration paths of the elephants and in some case have directly led to their deaths. The major reservoirs in the area include Sholayar, Parambikulam-Aliyar, Amaravati, Kadamparai etc. These developmental projects meant for hydroelectric power and irrigation have fragmented the habitat and this in turn obstructed the movement of the animals in the region. The canal leading from Tunacadavu reservoir to the Sarkarpathi power house is open in four stretches which has led to the washing of elephant

calf at times by the swift current. Abutting of the contour canal with the steep slopes in certain areas obstructs the movement of many wild animals.

Tea, Coffee & Cardamom estates - Mid western portion of the reserve viz. Valparai region, is occupied by a number of tea, coffee and cardamom estates which extends to an area of more than 20,000 ha. Only in a few places, narrow corridors are available for the movement of the elephants in an East-West direction. It is worth mentioning here that towards south of the conservation area, the extensive cardamom and other plantations in Devikulam - Periyar region have completely eliminated the elephant corridor, thus the two populations of Anamalai & Periyar stand separated.

These two key stresses have been responsible to a very large extent in fragmentation of the habitat and related crop-raiding and man-animal conflict in the region.

Presence of the tribal enclaves - Indira Gandhi Wildlife sanctuary harbours 36 tribal settlements, which are spread throughout the park. These settlements also act as the points for various biotic disturbances. Traditionally, the tribals residing in these settlements were dependent on various forestry operations like logging, thinning and NTFP collection. With the declaration of area as protected area, these tribals have been deprived off with the source of livelihood and are now confined to primitive style of agriculture on their land as well as seasonal employment with the Forest Deptt. and adjoining estates. These settlements have now become the source of various disturbance regimes like illicit NTFP collection, fire, grazing, cattle penning and connivance with the anti-social elements. Efforts to relocate these settlements have also failed and now they happen to be one of the potential sources for the spread of various biotic

interferences and disturbance regimes inside the protected area.

Extensive plantations - The presence of extensive plantation areas of teak, eucalyptus in the lower reaches of Anamalai & Dindigul and wattle, pine plantations in the upper reaches mainly in Kodaikanal area has definitely destroyed the once good wildlife habitat. These plantations are often infested with the weeds such as Lantana, Eupatorium, which deplete animals of their critical habitats, especially ungulates. Thorough the industrial plantations of eucalyptus, wattle and pine were developed with the objective of meeting the requirements of forest based industries, but with the focus on conservation, these areas are now viewed as fuel reserves for the community at large.

Wildlife Poaching - Elephant poaching in Indira Gandhi Wildlife sanctuary has been reported and at least 1 to 2 elephants have been reported as poached in the recent times. Though the current incidences are not very high, a threat for ivory poaching exists. Incidences of Sambar, Gaur and wild pig poaching for meat have also been reported in the ACA, especially when the animal moves out of the forest area in the adjoining pattaland. Ivory poachers are organized gangs as compared with the meat poachers and have to be dealt with more strictly.

Ganja (Narcotics) cultivation - Large tracts in the protected area especially Manjampatti, High forest, Cinchona, area, Upper Kurumalai are susceptible to ganja (*Cannabis indica*) cultivation besides Palani, Kukkal and Khilanavayal areas of Dindigul and Kodaikanal. This cultivation besides felling of the prime dense forests also destroys the prime wildlife habitat.

b) Key findings as regards to species, habitats, substrates and process

The major findings of the different species and their

habitat requirements has been provided in the species profile but certain key species and habitats include -

Species

1. *Lion tailed macaque* - *Macaca silenus* is purely a forest species and is found only in the evergreen forests between 2000-3500 ft. in Western Ghats. Various shola pockets of Indira Gandhi Wildlife Sanctuary harbour this species including the private Puduthottam coffee estate in Valparai. Due to habitat destruction and poaching, their population is on decline.
2. *Nilgiri Langur* - These black langurs are denizens of the evergreen forests. They are found between 3000 and 7000 ft and mainly feed on fruits, leaves, bud shoots and flowers of shola trees. Of late, poaching incidences are on rise.
3. *Nilgiri Tahr* - This species is endemic to southern Western Ghats and prefers scarps and crags of near vertical cliff. They are found between 4000 and 6000 ft and usually graze in the upland meadows in the mornings & late afternoon. Poaching is a serious threat for this mountain goat.
4. *Asiatic elephant* - This species of ACA is of immense conservation interest because of its large home range and migratory behaviour. Man-animal conflicts in fragmented patches of Valparai plateau and crop depredation in certain outer slopes of the Sanctuary area are the associated problems.
5. *Grizzled Giant Squirrel* - This is the resident and endemic species to Western Ghats and is found in the riverine patches primarily and also extending to southern thorn forest and dry deciduous forest. It feeds on mainly fruits, seeds, leaves and bark of variety of plants and the population is confined to the Chinnar and Amaravati Dam areas of the sanctuary. Because of its limited and restricted distribution, the species needs special attention.
6. *Endemic birds* - Birds like Nilgiri wood pigeon, Nilgiri laughing thrush and Nilgiri pipit assume great conservation importance considering the habitat conditions depicted by them. Nilgiri wood pigeon is found mostly in the moist evergreen patches (near foothills) and feed on fruits, berries, small snails and wattle seeds (in Kodai region) Nilgiri laughing thrush is also found in dry deciduous forests interspersed with riparian patches besides moist and evergreen forests. Nilgiri pipit is found in high montane shola grassland area alongwith coffee and cardamom estates.
7. *Ficus spp*- Among the tree species, different species of ficus, fruit throughout the year and all frugivorous birds have a strong relationship with this species. Hornbills can be readily associated with the presence of ficus species. However, in the protected area, selective lopping of ficus leaves for the elephant camp is a potential threat, which may lead to the decline of this species.
8. *Herpetofauna* - Critical species include Anamalai salea, Beddome's frog, Jerdon's bullfrog, Large wrinkled frog etc. which have a strong bearing in its distribution as a result of habitat fragmentation. Many species unique to the ACA especially upper reaches of Anamalais are confined to forest fragments, some of them in privately owned coffee and cardamom estates.

Habitats

The areas that offer key habitat functions for a species such as breeding, fawning, roosting, nesting or those

that have obligate species completely dependent on specific situation for its existence are extremely significant. The key areas could be of biological or geomorphologic origin. Some key areas include-

1. *Shola-grassland* - This type of forest occurs above 1350m and is distributed mainly in Grass Hills of Valparai & Upper Kurumalai of Udumalpet Range in the sanctuary area and is also found in the upper reaches of Palani Range in Dindigul division as well as Berijam lake area of Kodaikanal division. The evergreen sholas occur in pockets in a shattered cool climate and grasslands on the ridges. They support range of endemic species like Nilgiri Tahr etc.
2. *Hill Forests* - Tropical wet evergreen forest occurs in Valparai, Manamboly and Ulandy ranges as well as Periya sholai of Udumalpet Range in Anamalai sanctuary. These rain forests are seen at elevations from 800m to 1350 with luxuriant growth on the windward side. The canopy is extremely dense and epiphytes are numerous especially orchids, ferns, tree mosses, canes, creeping bamboo and palms. It is also available in the Berijam area of Kodaikanal. LTM is the representative species in some of the areas.
3. *Vayals & Grassy blanks*- The swampy areas known as vayals are key microhabitat elements for variety of wildlife especially amphibians.
4. *Cliffs & Rocky outcrops* - These geomorphic key elements are critical sites for Nilgiri tahr.
5. *Caves & Dens* - They are significant for various nocturnal animals as well as reptiles. The foothills of the Anamalai especially in Pollachi, Udumalpet and Amaravati Range and also Palani Range of Dindigul division support number of caves & dens

in the southern Thorn and Dry deciduous forest areas.

6. *Riparian areas* - These occur as tall bamboo clumps with occasional trees in moist deciduous forest. They prefer stream and river courses, shady slopes and sheltered places and are available in an altitudinal range of 300-900 m within ACA.

5.2 Application of Findings

a) Conservation of specific areas

Some of the key habitats like Shola - grassland association in Grasshills area of Valparai region (31.22 Sq. Km.) in Indira Gandhi Wildlife Sanctuary has already been declared as the National Park area. Similarly Karian shola (5.03 Sq. Km) in Top slip area has National Park status. The other critical habitats of Hill Forests and shola forests in Anamalai, Dindigul and Kodaikanal are being well conserved on account of certain endemic species like LTM & Nilgiri Langur in such areas. Most of the key elements of habitat in Anamalai enjoy the protected status of sanctuary; however, in the managed forests of Dindigul and Kodaikanal there is a proposal to include such areas under proposed Kodaikanal wildlife sanctuary.

Steps can also be envisaged, after consultation with the local communities, to declare the managed forests of Kodaikanal and Dindigul, as Conservation Reserve for protecting the flora and fauna at the landscape level.

b) Designation of corridors

There are three major corridors within this conservation area used by the elephants to move between the western and eastern positions and all of them are located in the Indira Gandhi Wildlife Sanctuary.

1. *Attakatti - Upper Aliyar corridor* - It is located in the western part and the animals move along the steep hill slopes between Attakatti and Kadamparai using this corridor. It has undisturbed forest cover, however, constant vehicular movement on the Valparai -Pollachi road hinders movement of the animals.
2. *Iyerpadi - Water falls estate corridor* - This is along the Pollachi - Valparai road, located between Iyerpadi and waterfalls estates. There is a very narrow stretch of forest available in this gap and elephants are reported to cross during the dry season.
3. *Siluvaimedu - Kadamparai corridor* - This path is very rarely used as it has very narrow patch of forest and steep slopes.

In addition elephants often move through the tea estate themselves.

Besides, efforts should be envisaged for connecting Puduthottam estate LTM population with that of the closest forest population i.e. Iyerpadi.

c) Management of specific substrates

The specific substrates is suggested to be managed at 2 levels-

1. *Micro Habitat elements* - Here substrates of biological origin like snag, den trees, down logs, climbers etc. and unique habitats of geomorphic origin like caves/dens, overhangs, exposed rocks etc. should be protected. At least 10 snag trees / per hectare and 5 hollow logs and climbers / per hectare should be retained (as per recommendation of Sh. V.B. Sawarkar, "Manual for planning Wildlife Management in PA's & Managed forests).

2. *Macro habitat elements* - includes mesic sites, riparian zones, swamps, grassy blanks, grasslands, old stands etc. All these areas need to be identified and protected.

d) Other Management Recommendations

This includes –

ACA under one Circle

- In order to have a holistic management of ACA, it is suggested to bring the management of Indira Gandhi wildlife sanctuary under one Circle along with the administration of Dindigul and Kodaikanal divisions.

Habitat amelioration

- Consolidation of all the key habitat areas
- Phasing out of the monoculture like teak, eucalyptus, wattle, pine after experimentation and planting of indigenous species in the gaps. This needs to be done only after proper research and monitoring and experimental trials carried out in a small area.
- Eradication of all weeds and exotics like Lantana, Eupatorium, and Parthenium etc.
- Species-specific plant filling in the gaps.
- Water development within the cruising distance and as per zone of influence for the representative ungulate species.
- Construction of series of low-level check dams instead of big dams for ground water recharge and riverine vegetation amelioration.

Antipoaching measures

- Assessment of the problem and locating of antipoaching camps at vantage points.
- Development and strengthening of infrastructure including intelligence network and coordination with the other enforcement agencies.
- Security audit with the help of local tribals

- Monitoring of poacher's profile, seasonality of poaching and method employed.
- Providing insurance cover for the protection staff including tribals engaged as antipoaching watchers.
- Provision of rewards and incentives

Fire Protection

- establishing various causative factors and prioritizing fire management strategy by use of GIS (development of fire frequency map)
- understanding fire prevention measures well in advance and undertaking cool burning in certain critical wildlife habitats.

Grazing

- permitting rotational grazing in certain non sensitive areas and phasing out of the permits
- ban imposed on cattle penning to be implemented
- immunization of the livestock within 5 km. belt of the protected area.

NTFP removal

- stoppage of all NTFP from the protected area as per sec 29 of the Wildlife Protection Act and gradual reduction of NTFP removal from the managed forests of Kodaikanal & Dindigul

Tribal enclaves

- checking further expansion of the settlement by maintaining the EPT and creation of new one wherever required
- focus on Tribal Education for bringing the younger generation in the mainstream and slow reduction of biotic pressures over a period of time
- implementation of the State Human Rights Commission Recommendations meant for tribals residing inside the PA in favour of wildlife and its habitat

Ecotourism development

- development of sustainable ecotourism within the ambit of the management plan and to ensure that the disturbance on the habitat is least.
- emphasis on conservation education and interpretation.
- involvement of local community in ecotourism.

Bibliography

Ahmedullah, M. and Nayar, M. P., Endemic Plants of the Indian Region, Botanical Survey of India, Calcutta, 1986, vol. I, p. 261.

Brooks, T.M., R. A. Mittermeier, C. G. Mittermeier, G. A. B. Da Fonseca, A. B. Rylands, W. R. Konstant, P. Flick, J. Pilgrim, S. Oldfield, G. Magin, and C. Hilton-Taylor. 2002. Habitat loss and extinction in the hotspots of biodiversity. *Conservation Biology* 16:909-923.

Burnham, K. P., D. R. Anderson and J. L. Laake (1980). Estimation of density from Line Transect Sampling of Biological Populations . *Wildl. Monogr. No. 72*. pp 202

Cincotta R. P., and R. Engelman. (2000). Nature's place: Population and the future of biodiversity. *Population Action International*, Washington, D.C.

Cleghorn, H. *Forests and Gardens of South India*, W. B. Allen and Co. London, 1861.

Champion, S. G. & Seth, S. K. (1968) A revised survey of forest types of India, Delhi Govt. of India Press.

- Daniels, R. J. R (1989). A conservation strategy for the birds of the Uttara Kannada district. Ph. D Thesis Indian Institute of Science Bangalore
- Daniels, R. J. R., A Field Guide to the Birds of Southwestern India, Oxford University Press, New Delhi, 1997, p.217.
- Daniels, R. J. R., Curr. Sci., 1993,64,706-708.
- Gadgil, M, in Conservation of the Indian Heritage (eds. Allchin, B. Allcfhin, E.R. and Thapar, B.K.), Cosmo Publications, New Delhi, 1989.
- Gadgil. M. Curr Sci., 1996.70,36-44.
- Hladik, C.M. Linares. O. F Hladik, A., Pagezy, H. and Semple. A, in Tropical Forests, People and Food. Bio-cultural Interactions and Applications to Development (eds. Hladik, C. M., Hladik, A., Linares, O. F Semple H. and Hadley, M.), MABVol.13, UNESCO and Parthenon, Paris,1993.
- Javed, S (1996). A study on bird community structure of the Terai forest in Dudwa National Park. Ph. D Thesis. Aligarh Muslim University Aligarh.
- Katti, M. (1989). Bird communities of lower pine forests of Dachigam National Park M. Sc. Dissertation, Wildlife Institute of India.
- Kajale, M.D. in Foraging and Farming the Evolution of Plant Exploitation (eds. Harris, D. R. and Hillman, G. C.), Unwin Hyman, London, 1989, pp269.
- Myers. N. The Environmentalist, 1990,10, pp. 273-295.
- Myers, N., R. A. Mittermeier, C. G. Mittermeier, and J. Kents. 2000. Biodiversity hotspots for conservation priorities. Nature 403:853-8858.
- Mehta, Prachi. (1998) The effects of forestry practices on the bird species diversity in the Satpura Hill Ranges. Ph. D Thesis, Saurashtra Univ. Rajkot.
- Prater, S.H, 1948 The book of Indian animals, BNHS, Bombay
- Rajendran, P. Prehistoric Cultures and Environment, Classical Publishing Co., New Delhi, 1989.
- Rodgers, W. A. and Panwar, H. S. (1998) Planning a Wildlife Protected Area Network in India, A Report prepared For the Department of Environment, Forests & Wildlife Government of India at Wildlife Institute of India.
- Saravankumar.(1996).(Unpublished) Impacts of habitat conversion on leaf litter anurans of Varangaliar, Western Ghats. Dessertation submitted for the partial fulfillment of Masters Degree in Wildlife Science Saurashtra University, Rajkot.
- Shankar Raman, T. R (1989) Shifting cultivation and conservation if tropical forest bird communities in Mizoram, North India M. Sc. Dissertation, Wildlife Institute of India Dehradun.
- Sukumar, R. Ramesh, R. Pant, R.K. and Rajgopalan, G., Nature, 1993, 364, 703-706.
- Sundra, A., in Perspectives in Dakshina Kannada and Kodagu, Mangalore University Secennial Volume, 1991, pp.41-63.

Swengal, F.B., The Nilgiri Tahr Studbook, Minnesota Zoo, USA, 1991, p.26.

Unnikrishnan, V., Sacred Groves of North Kerala – an Eco-Folklore Study (in Malayam), jeevarekha, Thrissur, 1995.

WII, USFWS & SACON, 2001 Report on Impact of Rain Forest Fragmentation on Small Mammals & Herpetofauna in the Western Ghats, South India.

Ward, Lt. and Conner, Lt., Memoir of the Survey of the Travancore and Cochin States, Surveyor-General's Office, Madras, 1827.

