

ENVIRONMENTAL IMPACT ASSESSMENT OF TACID GROWTH CENTRE, PERUNDURAI, PERIYAR DISTRICT, TAMIL NADU

(RAPID FLORAL AND FAUNAL SURVEY)

INVESTIGATORS

P. A. Azeez
P. Balasubramanian
S. Bhupathy
and
R. Sivakumar



SACON Library



PR10

Salim Ali Centre
For Ornithology & Natural History
Coimbatore, Tamil Nadu

August 1995

Bhupathy

PR10

**ENVIRONMENTAL IMPACT ASSESSMENT OF
TACID GROWTH CENTRE, PERUNDURAI,
PERIYAR DISTRICT, TAMIL NADU**

(RAPID FLORAL AND FAUNAL SURVEY)

INVESTIGATORS

P. A. Azeez
P. Balasubramanian
S. Bhupathy
and
R. Sivakumar

SACON Library



PR10

Salim Ali Centre
For Ornithology & Natural History
Coimbatore, Tamil Nadu

August 1995

CONTENTS

1.0 INTRODUCTION	1
2.0 METHODOLOGY	2
2.1 FLORA AND VEGETATION	2
2.2 FAUNA	3
3.0 RESULTS	3
3.1 FLORA AND VEGETATION ECOLOGY	3
3.1.1 SPECIES RICHNESS	3
3.1.2 VEGETATION TYPES	3
3.1.3 SPECIES COMPOSITION IN DIFFERENT ZONES	4
3.2 FAUNA	5
3.3 WETLAND	6
4.0 OBSERVATIONS AND SUGGESTIONS	7
TABLES	11-18
FIGURE	19
APPENDICES	20-29
MAPS	30-32

1.0. INTRODUCTION

The Tamil Nadu Corporation for Industrial Infrastructure Development (TACID) envisaged an industrial complex in Perundurair taluk, Periyar district (Map 1), under industrial growth centre scheme, sponsored by the central and state governments. In Perundurair and Ingur villages, 2800 acres of land, both agricultural and dry wastelands, have already been acquired for the industrial complex. The area is proposed to house industries related with the manufacture and processing of textile, paper, edible oil, starch, food processing, engineering, bulk drugs and electronics. Other infra structure facilities such as roads, drainage system, hotels, police stations, banks, communication centre will be also developed. The complex will have an independent water supply of 15 MLD from river Cauvery and an independent power supply. A Common Effluent Treatment Plant (CETP) is also envisaged in the project. Areas are earmarked for location of various establishments.

Industrial Technical Consultants Organization of Tamil Nadu (ITCOT), which is conducting the Environmental Impact Assessment (EIA) of the project requested the Environmental Impact Assessment Division of Salim Ali centre for Ornithology and Natural History (SACON) to undertake a rapid assessment of the floral and faunal diversity of the area, with the following specific objectives;

- 1) make a list of the flora and fauna in the proposed industrial area and its surroundings up to a radial distance of 15 km from the central point of the growth center,
- 2) to examine the presence of any endangered or rare species, and
- 3) to find out whether any special type of vegetation / habitats will get affected because of the industrial estate and would need conservation measures.

2.0. METHODOLOGY

The terrestrial environs of Perundurai, for the purpose of the study, was categorized into three zones;

Zone 1. TACID Growth Center - Proposed industrial complex (Map 2),

Zone 2. Area extending to a radial distance of 15 km from industrial complex and,

Zone 3. Existing Reserve Forests (RF). Chennimalai RF, Villikaradu RF and Vayapadi RF are the three reserve forests lying within 15 km radius of the proposed growth Center.

A wetland, of approximately 77 ha. water spread area (Map 3), located near Vellode village about 15 km southeast of Perundurai is considered separately. The survey was conducted during the second and third week of July 1995.

2.1. FLORA AND VEGETATION

Plant species were recorded by intensive search and observations in different vegetation types. Vegetation sampling was done following quadrat method. Ten quadrates of size 10 x 10 m (100 m²) were laid randomly in each of the three zones. Name of the plant species and Girth at Breast Height (GBH) were recorded for trees. To record the shrubs, two smaller quadrates of 3 x 3 m were placed within each 100 m² quadrat mentioned above. The herbaceous vegetation was sampled by placing four separate (sub) quadrates of 1.0 X 1.0 m within each 100 m² quadrat. The density, abundance, frequency, relative density, relative abundance, relative dominance and Importance Value Index (IVI) of the plant species were calculated using standard equations. Density of each species denotes the number of individuals per quadrat. Abundance is the average number of individuals per quadrat of occurrence, and percentage frequency of the species is the proportion of number of quadrates in which it

occurs to the total number of quadrates studied. The Importance Value Index (IVI) is the sum of the relative values of frequency, density and dominance of individual species.

2.2. FAUNA

Faunal survey was conducted using intensive search method. Species of mammals, birds, reptiles and amphibians and their respective numbers were recorded during the survey. Transects of 500 m was used in terrestrial areas. Intensive searches were carried out in wetland, both in the water body as well as in the immediate surroundings. Reptiles and amphibians were recorded on locating them during the intensive search ie. opportunistic observation.

3.0. RESULTS

3.1. FLORA AND VEGETATION ECOLOGY

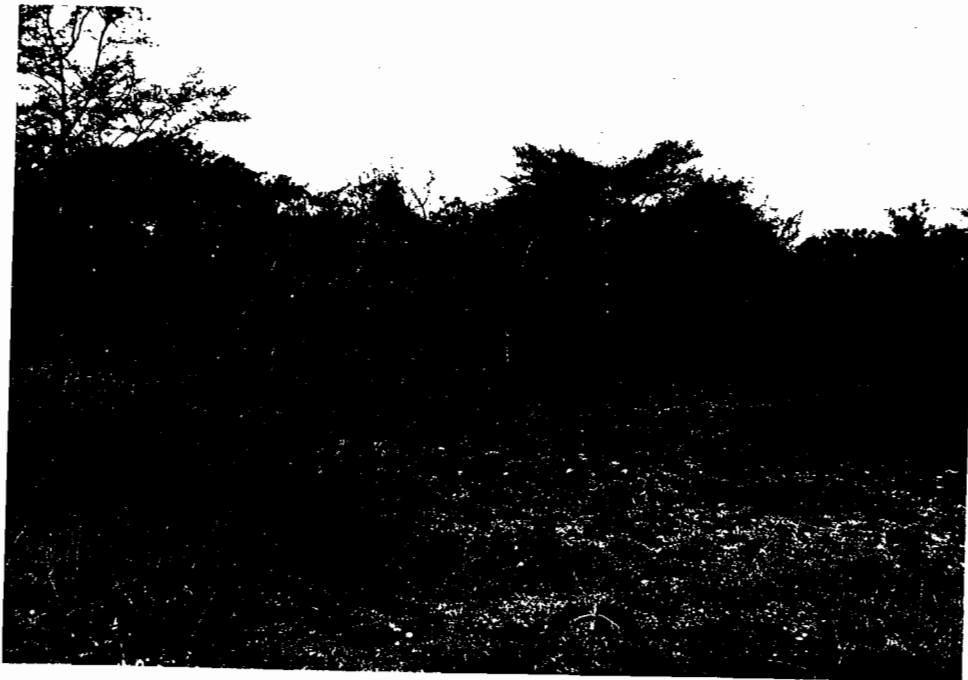
3.1.1. SPECIES RICHNESS

The flora of the study area includes 82 species of herbs, 61 trees, 52 shrubs and 19 climbers totalling to 214 species (Appendix I). This list excludes the monsoonal herbs. Almost 40% of the flora is represented by herbaceous vegetation. In monsoon the percentage may considerably go higher. About 50% of the trees recorded in the area are cultivated for ornamental purposes, fuel wood or as hedge plant.

3.1.2. VEGETATION TYPES

Most of the areas under the mandate of the survey were either cultivable lands or wastelands. Hence, herbaceous vegetation was predominant in the study area. Several species of Cactus and other xerophytic plants were present among the many arborescent flora of the area.

Vegetation in the site acquired for proposed TACID Growth Centre, Perundurai



The reserve forests (Chennimalai, Villikaradu and Vayapadi) and the protected vegetation patches in the medical college campus constitute small but floristically important locations. The reserve forests are mostly dry thorny forest. *Albizia amara* and *Acacia spp.* were the principal trees of the forest. Banks of the lower Bhavani canal that passes through the area support a large number of plant species, mainly deciduous and semi-deciduous types.

3.1.3. SPECIES COMPOSITION IN DIFFERENT ZONES

Highest number of species (species richness; 60) was recorded in zone 2. In the reserve forests (Zone 3) 42 species were recorded and in zone 1, the proposed industrial area, 41 (Fig. 1).

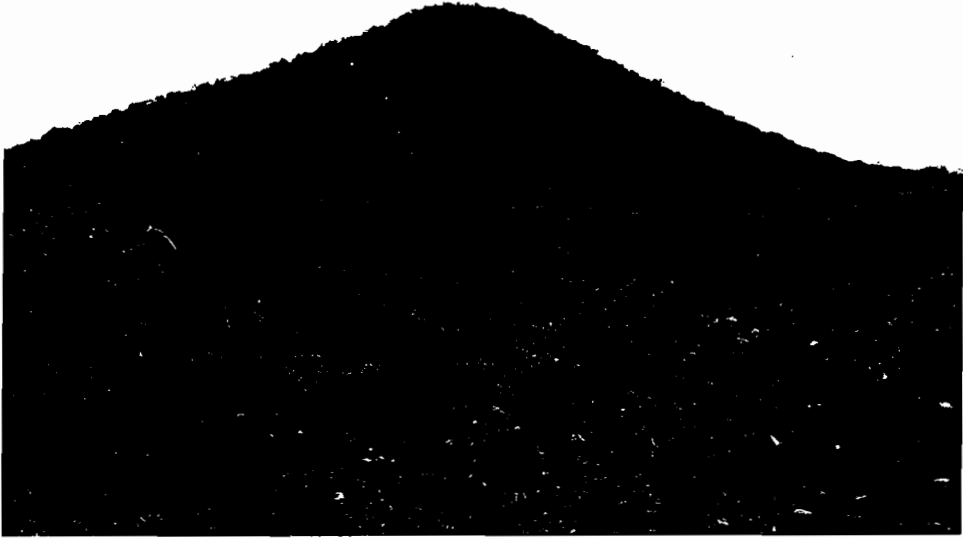
Zone 1. TACID Growth Center

In zone 1 forty one species of plants were recorded, of which only 17 are woody plants and the remaining herbs. Major tree species are *Commiphora berryi*, *Albizia amara* and *Borassus flabellifer*. The Importance Value Index (IVI) of these species are 99.5, 71.8 and 53.2 respectively (Table 1). Even though *A. amara* emerges as one of the dominant tree species, as all the individuals are regularly loped only coppice growth were noticed. Only 10 shrub species were recorded in this zone (Table 2) and that too in low frequency (Table 2). Of the 24 herb species recorded only three, namely *Tephrosia purpurea*, *Perotis indica* and *Aristida adscensionis* were highly frequent (Table 3). Several of the herbs recorded were common weeds.

Zone 2. the intermediate zone extending to a radial distance of 15 km from industrial complex

Sixty plant species were recorded in the zone 2. *Borassus flabellifer*, *Azadirachta indica* and *Euphorbia antiquorum* being principal trees. The respective IVI of these species

General vegetation type of the Reserve Forests around Perundurai



are 90.8, 67.3 and 44.6. *Acacia nilotica* is the common tree in the wetland. A number of submerged and floating hydrophytes are also seen in the wetland. The major species of hydrophytes are *Nymphaea*, *Ottelia*, *Hydrilla*, and *Marsilea*. The zone 2 has the highest number of plant species, because of the dense and diverse patches of vegetation along the banks of the lower Bhavani canal, Perundurai Medical College campus and the Periyakulum wetland situated towards the periphery of the zone. This zone holds a large number of cultivated trees and shrubs also. 32 species of herbs were recorded from this zone.

Zone 3. Reserve Forest

The vegetation in the reserve forests is mainly dry thorny forest. Forty two species were recorded here, of which several are deciduous. No rare species of tree or other plants were recorded during the survey. Species such as *Commiphora berryi* (IVI= 87.5), *Euphorbia antiquorum* (IVI= 62.3) and *Albizia amara* (IVI= 47.1) were the dominant trees. A few species occurring here such as *Ficus mollis*, *Pleiospermium alatum* and *Securinega leucopyrus* are important from an ecological point of view. They yield fruits which are nourished by birds and bats. However, these three species are common in similar habitats elsewhere. Herbaceous flora is not very rich in reserve forests.

3.2. FAUNA

Seven species of amphibians, 12 species of reptiles, 74 species of birds and four species of mammals were recorded during the present survey (Appendix II).

Zone 1. TACID Growth Center

Ten transects were run in zone 1 and, 35 species of birds recorded (Table 4). Other animals sighted were two species of reptile; namely Common Garden Lizard *Calotes versicolor* and Fanthroated Lizard *Sitana ponticeriana* and one mammal species namely

Palm Squirrel *Funambulus palmarum*. No amphibian was sighted during the survey in this zone.

Zone 2. the intermediate zone extending to a radial distance of 15 km from industrial complex

Nine transects were covered in zone 2 and a total of 39 bird species recorded. In addition to the reptiles and mammals recorded in zone 1, Water snake *Xenochropis piscator* was recorded in this zone. Amphibian species, namely *Rana cyanophylctis*, *R. hexadactyla* and *Rana breviceps* were sighted in this area. The presence of higher number of species in this zone is mainly due to the presence of a few water bodies.

Zone 3. Reserve Forest

Nine transects were laid and 36 species of birds were observed in the reserve forest. Except for the presence of Grey Partridge, Whitebellied Drongo, Crimsonthroated Barbet and Peafowl, the bird fauna of reserve forest was similar to that of the other zones. Of the four species of mammals recorded during the survey, Bonnet Macaque *Macaca radiata*, Jungle Cat *Felis chaus* and Blacknaped Hare *Lepus nigricollis* were seen only in the reserve forest. All species of reptiles recorded during the present study (Appendix II), except Indian Flapshell Turtle *Lissemys punctata*, Indian Black Turtle *Melanochelys trjuga* and Water Snake *Xenochropis piscator* were recorded in this zone. No amphibian species were sighted as the area was too dry lacking water bodies.

3.3. WETLAND

The wetland located near Vellode village about 15 km southeast of Perundurai has dense floating and submerged vegetation. It is reported that this wetland receives water from rain and also from river Bhavani. Hydrophytes such as *Hydrilla verticillata*, *Nymphaea nouchali*, *Ottelia alismodium* and *Marsilea quadrifolia* are frequent in the area

which indicate the potentialities for the area to support a good waterfowl population. A number of other aquatic and semi-aquatic species such as *Ipomoea carnea*, *Alternanthera sessilis*, *Commelina sp.*, *Eichhornia crassipes*, *Limnophyton obtusifolium*, *Panicum sp.*, *Phyla nodiflora*, *Potamogeton nodosus* and *Typha angustata*, were also dense in this area. The water is thick and rich with dense phyto and zooplankton. *Tilapia mosambica*, *Channa marulius*, *Channa striatus*, *Cyprinus carpio*, *Labeo kontinus*, *Ctenopharyngodon idella* were a few species of fishes recorded in the wetland. During the two hours of intensive search, 36 species of birds were recorded of which 20 are totally water dependant. A number of water birds were making nest and breeding during the period of observation (Table 4). All species of amphibians and turtles recorded from various zones during the present survey were observed here. The wetland is used by local fishermen. It is reported that as many as 50 fishermen families depend on this wetland for livelihood and the wetland irrigates 300-400 acres of land.

4.0. OBSERVATIONS AND SUGGESTIONS

- 1) The TACID Growth Center comprising mainly agricultural and dry lands is not very rich in floristic diversity. Majority of the plants (60%) present here are herbs, mostly common weeds. Several of the woody plants are cultivated, mainly as hedge plants. One species of climber, namely *Tylophora indica* sighted in the core area is a known medicinal plant. However, it was sighted only once during the study period. Also, this species is commonly seen elsewhere. No endangered plant species are recorded in any of the three zones during this study period.
2. None of vegetation types present within the 10 km radius require attention from the point of view of conservation. The reserve forests are mainly thorny scrub forest and no rare species of plants was encountered during the study

The Periyakulam wetland, Vellode, Periyar district



3. The number of reptiles and amphibian species are under estimate due to the cryptic and secretive nature of these animals and the short duration of the survey. Few more species such as Olive Keelback, Russell's viper, Cobra and Chameleon are expected in the area. Seventy four bird species were recorded during the present survey which is more or less closer to the actual number of bird species distributed in this region during dry season. However, approximately 50 other species, mainly migrant birds could be added to the list, if surveys are conducted during winter ie. November-February.
4. A perusal of literature revealed that no endemic species of amphibians, reptiles, birds and mammals exist in this region.
5. Animals listed in the Schedule I and II of the Wildlife Protection Act 1972 (as amended in 1991) are considered herein as endangered species. Eight species of reptiles, two species of birds and two species of mammals which are included in the endangered species list are present in the study area (zone 1, 2 and reserve forest). However (Table 5) all these species are hardy and widely distributed. Also, they are common elsewhere. We do not see the industrial complex causing a major threat to these species.
6. The Vellode Periyakulum wetland alone provides habitat for a number of water birds. At least 20 exclusive water bird species numbering about 645 that too in the lean period reveals that this area could be developed into a good waterbird reserve. All precautions should be taken to prevent any effluents reaching this water body. The chances of liquid effluent reaching this wetland seem to be distant for; a) the distance to the growth center and b) the wetland is situated at a higher elevation. The chances of aerial pollutants reaching the site have to be

checked using wind data. A check on the ground water quality also will be advisable to proceed with appropriate control measures, if required.

7. Low lying agricultural areas of Palathozhuvu and adjacent to Bhavani canal (example Vaikalmedu) are prone to contamination from water borne pollutants. Proper designing, location and maintenance of Common Effluent Treatment Plant (CETP) and Effluent Discharge Canal will mitigate the problem. Apart from other considerations, an examination of ground water quality also will be useful in properly locating the effluent treatment system.
8. A green belt, planted with indigenous and fruit-bearing species will be useful in the improvement of environmental quality (eg; air and noise pollution). The green belt will also help in attracting birds and other fauna.
9. It is commendable that valuable baseline data is generated on various aspects of the environs of Perundurai TACID Growth Centre under the leadership of ITCOT. A plan for continuous monitoring of the Growth Centre and the surroundings is advisable to assure existence of an eco-friendly industrial complex.

The monitoring programme should include investigations on soil, surface and ground water, air, fauna and flora. Monitoring may be conducted at regular interval, may be once in two years covering dry and wet seasons. It will be advisable to have fixed sampling points / plots as far as the physical and chemical parameters are concerned. The parameters to be examined in air, water and soil samples have to be decided keeping in view the various industrial establishments proposed to be housed in the area. However, from the point of view of environment, few important general parameters are unavoidable. For

example in case of water samples pH, EC, salinity, alkalinity, COD, BOD, total and ammoniacal nitrogen, phosphates, select heavy metals, sulfate, coliforms etc. and in air samples gaseous pollutants such as SO_x and NO_x and also particulates (especially PM₁₀ fractions), heavy metals and PAHs are necessary to be checked. The performance of the CETP needs regular monitoring, preferably at shorter intervals. The monitoring can be entrusted to an independent research organization having expertise and infra-structure facilities. The programme may be supervised by a committee consisting of environmental, technical and management experts, and representatives from local administration, industrial and business community.

SACON is an autonomous research centre under the Ministry of Environment & Forests, Government of India. The centre has separate divisions for Environmental Impact Assessment (EIA), Ecotoxicology, Avian Ecology, Wetland Ecology, Terrestrial Ecology, Conservation Biology, Extension and Library and information. SACON is developing a Central Instrumentation Facility (CIF) with state of art instruments in environmental sampling and analyses. SACON has facilities for relational databases and statistical analyses and good computer, library and information system. The division of EIA has the capability and infra structure to make a fast assessment of environmental quality, ecology and socioeconomics of an area. The division is equipped in terms of technical capabilities and expertise to undertake the monitoring programme or to participate actively in the environmental monitoring committee of the TACID growth centre.

Table 1. Importance Value Index (IVI) of trees in different zones

Site	Species	Relative Frequency	Relative Dominance	Relative Density	IVI
Zone 1	<i>Acacia leucophloea</i>	6.67	0.44	1.91	9.02
	<i>Ailanthus excelsa</i>	6.67	8.19	1.91	16.77
	<i>Albizia amara</i>	20	9.42	42.37	71.79
	<i>Azadirachta indica</i>	20	11.22	9.53	40.75
	<i>Borassus flabellifer</i>	20	27.44	5.72	53.16
	<i>Commiphora berryi</i>	20	42.85	36.65	99.5
	<i>Prosopis chilensis</i>	6.67	0.44	1.91	9.02
Zone 2	<i>Albizia amara</i>	5.56	1.61	5.23	12.4
	<i>Albizia lebbeck</i>	5.56	10.68	2.61	18.85
	<i>Azadirachta indica</i>	27.78	7.66	31.59	67.03
	<i>Borassus flabellifer</i>	16.67	55.63	18.53	90.83
	<i>Cocos nucifera</i>	5.56	7.27	7.84	20.67
	<i>Commiphora caudata</i>	5.56	0.21	2.61	8.38
	<i>Euphorbia antiquorum</i>	11.11	12.31	21.14	44.56
	<i>Holoptelia integrifolia</i>	5.56	3.57	2.61	11.74
	<i>Prosopis chilensis</i>	5.56	0.41	2.61	8.58
	<i>Wrightia tinctoria</i>	5.56	0.34	2.61	8.51
	<i>Zizyphus oenoplia</i>	5.56	0.3	2.61	8.47
Zone 3	<i>Acacia horrida</i>	2.7	0.21	2.63	5.54
	<i>Albizia amara</i>	18.92	1.84	26.32	47.08
	<i>Azadirachta indica</i>	5.41	1.53	2.63	9.57
	<i>Canthium dicoccum</i>	2.7	0.19	1.32	4.21
	<i>Chloroxylon swietenia</i>	5.41	0.65	3.95	10.01
	<i>Commiphora berryi</i>	21.62	43.49	22.37	87.48
	<i>Euphorbia antiquorum</i>	18.92	18.38	25	62.3
	<i>Ficus mollis</i>	2.7	17.87	1.32	21.89
	<i>Gyrocarpus americanus</i>	5.41	5.7	2.63	13.74
	<i>Prosopis chilensis</i>	2.7	0.12	1.32	4.14
	<i>Wrightia tinctoria</i>	13.51	10.03	10.53	34.07

Table 2: Density, Abundance and Frequency of shrubs in different zones

Site	Species	Density	Abundance	Frequency	
				%	Class
Zone 1	<i>Aerva javanica</i>	0.5	5	10	A
	<i>Azima tetraantha</i>	0.05	1	5	A
	<i>Barleria cuspidata</i>	0.3	3	10	A
	<i>Calotropis gigantea</i>	0.1	1	10	A
	<i>Capparis sepiaria</i>	0.3	3	10	A
	<i>Cassia auriculata</i>	0.2	1.33	15	A
	<i>Cissus quadrangularis</i>	0.05	1	5	A
	<i>Datura metel</i>	0.1	2	5	A
	<i>Justicia tranquebariensis</i>	0.35	3.5	10	A
	<i>Opuntia dillenii</i>	0.1	1	10	A
Zone 2	<i>Aerva javanica</i>	0.13	2	6	A
	<i>Barleria cuspidata</i>	0.63	2	31	B
	<i>Calotropis gigantea</i>	0.06	1	6	A
	<i>Canthium parviflorum</i>	0.13	2	6	A
	<i>Capparis sepiaria</i>	0.13	2	6	A
	<i>Caralluma adscendens</i>	0.13	2	6	A
	<i>Chromolaena odorata</i>	1.44	5.75	25	B
	<i>Cissus quadrangularis</i>	0.31	1.67	19	A
	<i>Datura metel</i>	0.06	1	6	A
	<i>Jatropha curcas</i>	0.19	3	6	A
	<i>Jatropha glandulifera</i>	0.13	2	6	A
	<i>Justicia tranquebariensis</i>	0.25	4	6	A
	<i>Lantana camara</i>	0.31	2.5	13	A
	<i>Martynia annua</i>	0.13	2	6	A
	<i>Orthosiphon thymiflorus</i>	0.75	4	19	A
	<i>Premna sp.</i>	0.19	1.5	13	A
<i>Solanum sp.</i>	0.13	2	6	A	

Site	Species	Density	Abundance	Frequency	
				%	Class
Zone 3	<i>Acalypha fruticosa</i>	1.38	2.75	50	C
	<i>Barleria cuspidata</i>	0.17	1.33	13	A
	<i>Catunaregam spinosa</i>	0.21	1.67	13	A
	<i>Cissus quadrangularis</i>	0.29	1.75	17	A
	<i>Jatropha glandulifera</i>	0.04	1	4	A
	<i>Mundulea sericea</i>	0.88	3	29	B
	<i>Opuntia dillenii</i>	0.17	1	17	A
	<i>Pleiospermium alatum</i>	0.08	1	8	A
	<i>Premna sp.</i>	0.17	1.33	13	A
	<i>Pterolobium indicum</i>	0.08	1	8	A
	<i>Sanseveiera roxburghiana</i>	0.04	1	4	A
	<i>Securinega leucopyrus</i>	0.29	1.4	21	B
<i>Solanum indicum</i>	0.5	2.4	21	B	

Frequency Classes: Class A 0-20%, Class B 21-40%, Class C 41-60%, Class D 61-80%, Class E 81-100%

PR10

Table 3: Density, Abundance and Frequency of herbs in different zones

Site	Species	Density	Abundance	Frequency	
				%	Class
Zone 1	<i>Aristolochia bracteolata</i>	0.64	5.6	11	A
	<i>Boerhavia diffusa</i>	0.11	1.25	9	A
	<i>Cassia obtusa</i>	0.02	1	2	A
	<i>Chloris inflata</i>	0.2	3	7	A
	<i>Cleome sp.</i>	0.05	1	5	A
	<i>Cleome viscosa</i>	0.14	3	5	A
	<i>Corchorus sp.</i>	0.2	3	7	A
	<i>Croton bonplandianus</i>	0.23	2	11	A
	<i>Cynodon dactylon</i>	0.57	5	11	A
	<i>Bulbostilis barbatus</i>	0.16	7	2	A
	<i>Cyperus rotundus</i>	1.52	9.57	16	A
	<i>Euphorbia hirta</i>	0.09	2	5	A
	<i>Evolvulus alsinoides</i>	0.05	2	2	A
	<i>Leucas aspera</i>	0.02	1	2	A
	<i>Mollugo sp.</i>	1.48	8.13	18	A
	<i>Pavonia procumbens</i>	0.02	1	2	A
	<i>Perotis indica</i>	2.7	9.15	30	B
	<i>Phyllanthus sp.</i>	0.02	1	2	A
	<i>Rhynchosia minima</i>	0.32	1.75	18	A
	<i>Tephrosia purpurea</i>	3.77	5.03	75	D
<i>Tragus roxburghii</i>	1.7	15	11	A	
<i>Tribulus terrestris</i>	0.3	2.17	14	A	
<i>Tridax procumbens</i>	0.02	1	2	A	
Zone 2	<i>Aerva lanata</i>	0.03	1	3	A
	<i>Alysicarpus vaginalis</i>	0.15	2.5	6	A
	<i>Aristida adscensionis</i>	1.65	5.09	32	B
	<i>Boerhavia diffusa</i>	0.56	2.11	26	B
	<i>Bulbostylis barbata</i>	0.09	1.5	6	A
	<i>Cassia obtusa</i>	0.68	7.67	9	A
	<i>Cleome aspera</i>	0.24	4	6	A
	<i>Cleome viscosa</i>	0.68	3.83	18	A
	<i>Commelina sp.</i>	0.06	2	3	A
	<i>Corchorus sp.</i>	0.53	2.57	21	B
	<i>Corchorus tridens</i>	0.09	3	3	A
	<i>Croton bonplandianus</i>	0.15	2.5	6	A
	<i>Cynodon dactylon</i>	0.82	3.11	26	B
	<i>Cyperus rotundus</i>	1	4.86	21	B
	<i>Cyperus sp.</i>	0.21	3.5	6	A
	<i>Elytraria acaulis</i>	0.09	3	3	A

Site	Species	Density	Abundance	Frequency	
				%	Class
Zone 2	<i>Evolvulus alsinoides</i>	0.29	3.33	9	A
	Grass	0.06	2	3	A
	<i>Indigofera linnaei</i>	0.18	2	9	A
	<i>Justicia tranquebariensis</i>	0.03	1	3	A
	<i>Mollugo sp.</i>	0.29	3.33	9	A
	<i>Ocimum canum</i>	0.03	1	3	A
	<i>Perotis indica</i>	0.44	5	9	A
	<i>Phyllanthus sp.</i>	0.03	1	3	A
	<i>Polycarpaea corymbosa</i>	0.09	3	3	A
	<i>Portulaca tuberosa</i>	0.06	2	3	A
	<i>Rhynchosia minima</i>	0.38	4.33	9	A
	<i>Tephrosia purpurea</i>	2.62	7.42	35	B
	<i>Tragus roxburghii</i>	1.06	9	12	A
	<i>Tribulus terrestris</i>	0.5	2.43	21	B
	<i>Tridax procumbens</i>	0.5	2.83	18	A
<i>Zoysia matrella</i>	1.68	11.4	15	A	
Zone 3	<i>Achyranthus aspera</i>	0.03	1	3	A
	<i>Aerva lanata</i>	0.29	2.5	12	A
	<i>Aristida adscensionis</i>	1.09	2.85	38	B
	<i>Barleria cuspidata</i>	0.03	1	3	A
	<i>Boerhavia diffusa</i>	0.35	1.71	21	B
	<i>Cassia occidentalis</i>	0.06	2	3	A
	<i>Chloris sp.</i>	0.65	4.4	15	A
	<i>Corchorus sp.</i>	0.24	2	12	A
	<i>Elytrana acaulis</i>	1.15	6.5	18	A
	<i>Evolvulus alsinoides</i>	0.38	2.6	15	A
	<i>Indigofera sp.</i>	0.06	2	3	A
	<i>Ocimum canum</i>	0.09	1.5	6	A
	<i>Pavonia procumbens</i>	0.21	2.33	9	A
	<i>Polycarpaea corymbosa</i>	0.12	2	6	A
	<i>Tephrosia purpurea</i>	0.03	1	3	A
	<i>Tridax procumbens</i>	0.06	2	3	A
	<i>Triumfetta sp.</i>	0.06	2	3	A
<i>Zoysia matrella</i>	0.5	5.67	9	A	

Frequency Classes: Class A 0-20%, Class B 21-40%, Class C 41-60%, Class D 61-80%, Class E 81-100%

Table 4. Bird species sighted in various categories of land during a rapid survey between 10 and 20 July 1995 in and around Perundurai.

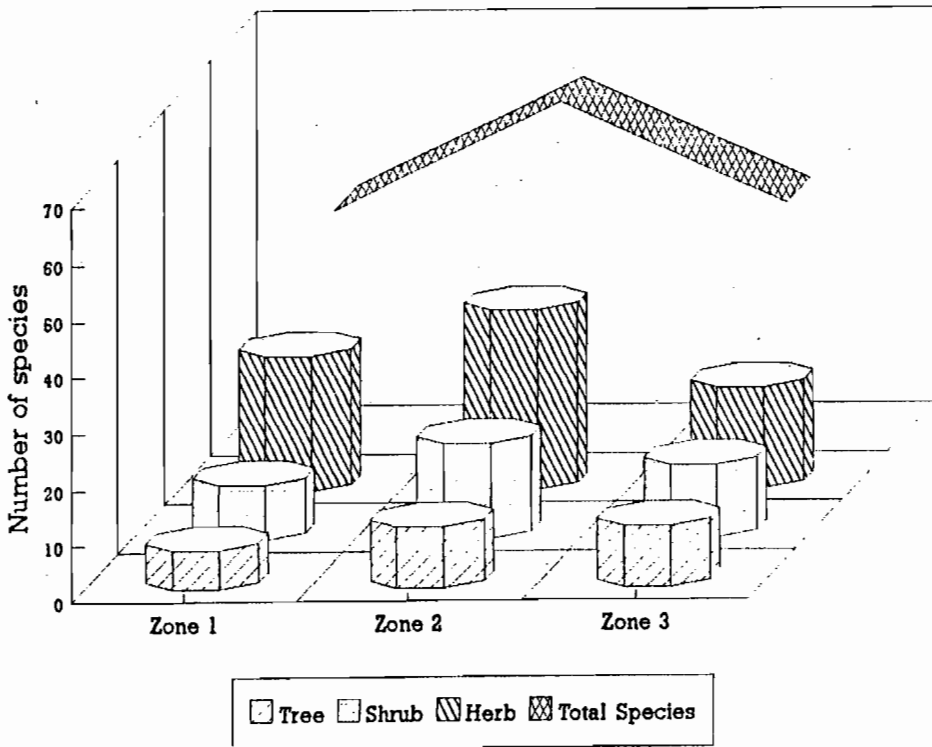
S. No.	Bird species	Zone 1	Zone 2	Zone 3	Welland
1	Little Grebe		2		50
2	Little Cormorant				100
3	Darter or Snake-bird				5
4	Grey Heron				8
5	Purple Heron		1		8
6	Pond Heron		2		60
7	Cattle Egret				10
8	Little Egret				50
9	Night Heron				15
10	White Ibis				1
11	Spoonbill				2
12	Cotton Teal				10
13	Blackwinged Kite		1		
14	Honey Buzzard	1			
15	Pariah Kite				5
16	Brahminy Kite			3	5
17	Indian Shikra			1	
18	Grey Partridge			5	
19	Common Peafowl			12	
20	Whitebreasted Waterhen		1		4
21	Indian Moorhen				100
22	Coot				200
23	Pheasant-tailed Jacana				4
24	Redwattled Lapwing	1	2		
25	Blue Rock Pigeon		10		
26	Spotted Dove	2			
27	Indian Ring Dove			1	
28	Rose-ringed Parakeet	7	4	5	4
29	Pied Crested Cuckoo	1	2	2	2
30	Cuckoo	2	1	2	1
31	Koel	1	1	2	
32	Greenbilled Malkoha	4			1
33	Crow-Pheasant	1	3	5	
34	Spotted Owlet			2	
35	Palm Swift	35	9	4	5
36	Lesser Pied Kingfisher				8
37	Small Blue Kingfisher		1		4
38	Whitebreasted Kingfisher	1	3	1	8
39	Small Green Bee-eater	2	1		

S. No.	Bird species	Zone 1	Zone 2	Zone 3	Welland
40	Indian Roller	12	6	1	1
41	Hoopoe	3	2	1	
42	Crimsonthroated Barbet			3	
43	Goldenbacked Woodpecker	2		1	1
44	Ashycrowned Finch Lark	1			
45	Rufoustailed Finch Lark	1			
46	Crested Lark	2			
47	Skylark	2	1		
48	Ashy Swallow-shrike				2
49	Golden Oriole	1		1	
50	Black Drongo	6	7	10	
51	Whitebellied Drongo			2	
52	Common Myna	21	17	16	
53	Brahminy Myna	2		2	
54	Tree Pie		3	4	1
55	House Crow	4	6	8	5
56	Jungle Crow	19	9	7	7
57	Common Wood Shrike	1		1	
58	Common Iora		1		
59	Whitecheeked Bulbul			2	
60	Redvented Bulbul	7	9	18	4
61	Whiteheaded Babbler	57	15	22	
62	Ashy Wren Warbler	2	2		
63	Tailor Bird	5	4	9	2
64	Magpie Robin		1		
65	Pied Bush Chat		8	2	
66	Indian Robin	5			
67	Pipit	2	2		
68	Grey Wagtail		1		1
69	Pied or White Wagtail		1		2
70	Purplerumped Sunbird			2	
71	Purple Sunbird	2	4	11	
72	House Sparrow	4	5	9	
73	Yellowthroated Sparrow			4	
74	Whitebacked Munia	1			
Total Number of species seen		35	36	35	36
Total Number of Transects		10	9	9	1*
One survey (2 hrs. direct observation)					

Table 5. Possible endemic and endangered species distributed in and around Perundurai.

Animal Group	Endemic species	Endangered species*
Fishes	-	-
Amphibians	-	-
Reptiles	-	Indian Flapshell Turtle Chameleon Checked Keelback Snake Rat Snake Cobra Olive Keelback Russell's Viper Common Monitor
Birds	-	Peafowl Spoonbill
Mammals	-	Jungle Cat Bonnet macaque
Schedule I & II of the Wildlife Protection Act 1972 (Anon 1991)		

Fig 1. Plant species richness in three different zones



Appendix -I. Plants in and around Perundurai (Periyar District) recorded during rapid survey between 10 and 20 July 1995

S.No	Species	Zone 1	Zone 2	Zone 3
1	<i>Acacia horrida</i>			+
2	<i>Acacia leucophloea</i>	+	+	+
3	<i>Acacia nilotica</i> #		+	
4	<i>Acacia planifrons</i>			+
5	<i>Acacia</i> sp.			+
6	<i>Ailanthus excelsa</i> *	+	+	
7	<i>Alangium salviifolium</i>		+	
8	<i>Albizia amara</i>	+		+
9	<i>Albizia lebbeck</i> *			+
10	<i>Annona squamosa</i> *		+	
11	<i>Azadirachta indica</i>	+	+	+
12	<i>Bauhinia variegata</i> *		+	
13	<i>Borassus flabellifer</i> *	+	+	
14	<i>Canthium dicoccum</i>			+
15	<i>Carica papaya</i> *		+	
16	<i>Casuarina equisetifolia</i> *		+	
17	<i>Ceiba pentandra</i> *		+	
18	<i>Chloroxylon swietenia</i>			+
19	<i>Cocos nucifera</i> *	+	+	
20	<i>Commiphora berryi</i>	+	+	+
21	<i>Commiphora caudata</i> *		+	
22	<i>Delonix elata</i> *		+	
23	<i>Delonix regia</i> *		+	
24	<i>Dichrostachys cinerea</i>		+	+
25	<i>Diospyros montana</i>			+
26	<i>Enterolobium saman</i> *		+	
27	<i>Eucalyptus globulus</i> *		+	
28	<i>Euphorbia antiquorum</i>	+	+	+
29	<i>Euphorbia tirucalli</i>		+	
30	<i>Ficus benghalensis</i>		+	
31	<i>Ficus infectoria</i>		+	
32	<i>Ficus mollis</i>			+
33	<i>Ficus religiosa</i>		+	
34	<i>Gmelina asiatica</i>		+	
35	<i>Gyrocarpus americanus</i>			+
36	<i>Hibiscus tiliaceus</i>		+	
37	<i>Holoptelia integrifolia</i>			+
38	<i>Lannea coromandelica</i>		+	
39	<i>Leucaena leucocephala</i> *	+	+	

S.No	Species	Zone 1	Zone 2	Zone 3
40	<i>Madhuca indica</i> *		+	
41	<i>Mangifera indica</i> *		+	
42	<i>Millingtonia hortensis</i> *		+	
43	<i>Moringa oleifera</i> *		+	
44	<i>Peltophorum pterocarpum</i> *		+	
45	<i>Phyllanthus acidus</i> *			
46	<i>Pithecellobium dulce</i> *		+	
47	<i>Polyalthia longifolia</i> *		+	
48	<i>Pongamia pinnata</i> *		+	
49	<i>Prosopis chilensis</i>	+	+	+
50	<i>Psidium gujava</i> *		+	
51	<i>Pterolobium indicum</i>			+
52	<i>Punica granatum</i> *		+	
53	<i>Ricinus communis</i> *		+	
54	<i>Sapindus emarginata</i>			+
55	<i>Tamarindus indica</i> *	+	+	+
56	<i>Tectona grandis</i> *		+	
57	<i>Terminalia catappa</i> *		+	
58	<i>Thespesia populnea</i> *		+	
59	<i>Wrightia tinctoria</i>	+	+	+
60	<i>Zizyphus mauritiana</i>	+	+	
61	<i>Zizyphus oenoplia</i>		+	
SHRUBS				
62	<i>Abutilon indicum</i>		+	
63	<i>Aerva javanica</i>	+	+	+
64	<i>Allamanda cathartica</i> *		+	
65	<i>Anisomelos malabarica</i>		+	
66	<i>Asystasia gangetica</i>		+	
67	<i>Azima tetraacantha</i>	+	+	+
68	<i>Barleria cuspidata</i>		+	
69	<i>Bougainvillea glabra</i> *		+	
70	<i>Caesalpinia pulcherima</i> *		+	
71	<i>Calotropis gigantea</i>	+	+	+
72	<i>Canna indica</i> *		+	
73	<i>Canthium parviflorum</i>		+	+
74	<i>Capparis sepiana</i>		+	+
75	<i>Capparis sp.</i>		+	+
76	<i>Cascabela thevetia</i>		+	+
77	<i>Cassia auriculata</i>		+	+
78	<i>Cassia occidentalis</i>		+	+
79	<i>Catunaregam spinosa</i>		+	+



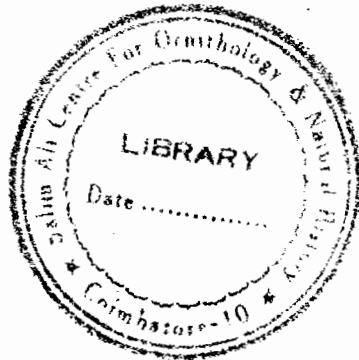
S.No	Species	Zone 1	Zone 2	Zone 3
80	<i>Cereus plerogonus</i>		+	
81	<i>Chromolaena odorata</i>	+	+	+
82	<i>Cylindropuntia ramossisima</i>		+	
83	<i>Ervatamia divaricata*</i>		+	
84	<i>Furcraea foetida</i>	+	+	+
85	<i>Grewia sp.</i>			+
86	<i>Hibiscus rosasinensis*</i>		+	
87	<i>Ipomoea carnea #</i>		+	
88	<i>Jatropha curcas</i>		+	
89	<i>Jatropha glandulifera</i>		+	+
90	<i>Jatropha gossipifolia</i>		+	
91	<i>Justicia tranquibarensis</i>	+	+	+
92	<i>Lantana camara</i>		+	+
93	<i>Mundulea sericea</i>			+
94	<i>Murraya koenigi*</i>		+	
95	<i>Nerium oleander*</i>		+	
96	<i>Opuntia dillenii</i>	+	+	+
97	<i>Orthosiphon thymiflorus</i>	+	+	+
98	<i>Pandanus odoratissimus</i>		+	
99	<i>Parthenium hysterophorus</i>	+	+	+
100	<i>Phoenix humilis</i>		+	
101	<i>Phyllanthus reticulatus</i>		+	+
102	<i>Pleiospermium alatum</i>			+
103	<i>Polygonum sp.*</i>		+	
104	<i>Premna sp.</i>		+	
105	<i>Sarcostemma brunonianum</i>		+	
106	<i>Securinega leucopyrus</i>			
107	<i>Solanum incanum</i>		+	
108	<i>Solanum indicum</i>	+	+	+
109	<i>Solanum surattense</i>		+	
110	<i>Solanum torvum*</i>		+	
111	<i>Sphenoclea zeylanica</i>		+	
112	<i>Tephrosia purpurea</i>	+	+	+
113	<i>Vitex negundo</i>		+	
CLIMBERS				
114	<i>Abrus precatorius</i>	+	+	+
115	<i>Asparagus racemosus</i>	+	+	+
116	<i>Cardiospermum halicacabum</i>		+	+
117	<i>Cassytha filiformis</i>		+	
118	<i>Cissampelos pareira</i>		+	
119	<i>Cissus quadrangularis</i>	+	+	+

S.No	Species	Zone 1	Zone 2	Zone 3
120	<i>Citrus lanatus</i>		+	
121	<i>Clitoria tematea</i>		+	+
122	<i>Coccinia grandis</i>	+	+	+
123	<i>Ipomoea sp. #</i>		+	
124	<i>Ipomoea staphylina</i>	+	+	
125	<i>Jasminum angustifolium</i>		+	
126	<i>Kedrostis foetidissima</i>		+	
127	<i>Mukia maderaspatana</i>			+
128	<i>Passiflora foetida</i>		+	
129	<i>Pergularia daemia</i>	+	+	
130	<i>Tinospora cordifolia</i>		+	+
131	<i>Tylophora indica</i>	+	+	+
132	<i>Wattakaka volubilis</i>	+	+	+
HERBS				
133	<i>Abutilon crispum</i>			
134	<i>Abutilon indicum</i>		+	
135	<i>Acalypha fruticosa</i>	+	+	
136	<i>Acalypha indica</i>		+	
137	<i>Achyranthes aspera</i>		+	
138	<i>Aerva lanata</i>	+	+	+
139	<i>Altemanthera sessilis #</i>		+	
140	<i>Alysicarpus vaginalis #</i>		+	
141	<i>Amaranthus spinosus</i>		+	
142	<i>Amaranthus viridis</i>		+	
143	<i>Argemone mexicana</i>		+	
144	<i>Aristolida adscensionis</i>	+	+	+
145	<i>Aristolida sp.</i>		+	+
146	<i>Aristolochia bracteolata</i>	+	+	
147	<i>Barleria buxifolia</i>		+	
148	<i>Boerhavia diffusa</i>	+	+	+
149	<i>Bulbostylis barbata</i>	+	+	
150	<i>Caralluma adscendens</i>	+	+	+
151	<i>Cassia obtusa</i>	+	+	
152	<i>Catharanthus roseus</i>		+	
153	<i>Chloris inflata</i>	+	+	+
154	<i>Cleome aspera</i>	+	+	
155	<i>Cleome felina</i>	+	+	
156	<i>Cleome viscosa</i>	+	+	
157	<i>Commelina sp. #</i>		+	
158	<i>Conyza bonariensis</i>		+	
159	<i>Corchorus sp.</i>	+	+	+

S.No	Species	Zone 1	Zone 2	Zone 3
160	<i>Corchorus tridens</i>	+	+	+
161	<i>Croton bonplandianus</i>	+	+	+
162	<i>Cynodon dactylon</i>		+	
163	<i>Cyperus rotundus</i>		+	
164	<i>Datura metel</i>	+	+	
165	<i>Eclipta prostrata</i> #		+	
166	<i>Eichhornia crassipes</i> #		+	
167	<i>Elytraria acaulis</i>		+	+
168	<i>Euphorbia hirta</i>		+	
169	<i>Evolvulus alsinoides</i>	+	+	+
170	<i>Gisekia pharnaceoides</i>		+	
171	<i>Glossocardia bosvallea</i>		+	
172	<i>Gomphrena decumbens</i>		+	
173	<i>Heliotropium indicum</i>		+	
174	<i>Hibiscus vitifolius</i>		+	
175	<i>Hybanthus enneaspermus</i>		+	
176	<i>Hydrilla verticillata</i> #		+	
177	<i>Hyptis suaveolens</i>		+	
178	<i>Indigofera linnaei</i>	+	+	
179	<i>Indigofera</i> sp.			+
180	<i>Leucas aspera</i>	+	+	+
181	<i>Limnophyton obtusifolium</i> #		+	
182	<i>Marsilea quadrifolia</i> #		+	
183	<i>Martynia annua</i>		+	
184	<i>Mollugo nudicaulis</i>		+	
185	<i>Mollugo oppositifolia</i>	+	+	
186	<i>Mollugo pentaphylla</i>		+	
187	<i>Nymphaea nouchali</i> #		+	
188	<i>Ocimum canum</i>		+	+
189	<i>Ottelia alismoides</i> #		+	
190	<i>Panicum</i> sp. #		+	
191	<i>Pavonia procumbens</i>		+	+
192	<i>Pedaliium murex</i>	+	+	
193	<i>Perotis indica</i>	+	+	+
194	<i>Phyla nodiflora</i> #		+	
195	<i>Phyllanthus amarus</i> #		+	
196	<i>Phyllanthus</i> sp.		+	
197	<i>Polycarpaea corymbosa</i>	+	+	
198	<i>Polygala arvensis</i>		+	
199	<i>Portulaca tuberosa</i>		+	
200	<i>Potamogeton nodosus</i> #		+	

S.No	Species	Zone 1	Zone 2	Zone 3
201	<i>Psilotrichum elliotii</i>		+	
202	<i>Pycnopus sp.</i>		+	
203	<i>Rhynchosia minima</i>	+	+	+
204	<i>Sansevieria roxburghiana</i>		+	+
205	<i>Tragia plukenetii</i>			+
206	<i>Tragus roxburghii</i>	+	+	+
207	<i>Tribulus terrestris</i>	+	+	
208	<i>Trichodesma indicum</i>		+	
209	<i>Tridax procumbens</i>	+	+	
210	<i>Typha angustata</i> #		+	
211	<i>Vallisneria natans</i> #		+	
212	<i>Vernonia albicans</i>		+	
213	<i>Xanthium indicum</i>		+	
214	<i>Zoysia matrella</i>	+	+	+

* Cultivated species, + Present; # Aquatic and semi-aquatic plants



Appendix II. Vertebrate fauna sighted in and around Perundurai during rapid survey
(Fish fauna not included).

Scientific name	Common Name
Amphibians	
1. <i>Bufo melanostictus</i>	Indian Toad
2. <i>Rana cyanophlyctis</i>	Common Indian Frog
3. <i>Rana hexadactyla</i>	Indian Green Frog
4. <i>Rana limnocharis</i>	Indian Skipper Frog
5. <i>Rana breviceps</i>	Indian Burrowing Frog
6. <i>Rana tigerina</i>	Indian Bull Frog
7. <i>Microhyla omata</i>	Ornate Microhyla
Reptiles	
1. <i>Lissemys punctata</i>	Indian Flapshell Turtle
2. <i>Melanochelys trijuga</i>	Indian Black Turtle
3. <i>Hemidactylus frenatus</i>	House Gecko
4. <i>Hemidactylus brooki</i>	Brook's Gecko
5. <i>Hemidactylus leshnaulti</i>	Bark Gecko
6. <i>Hemidactylus tridureus</i>	Termite Hill Gecko
7. <i>Calotes versicolor</i>	Garden Lizard
8. <i>Sitana ponticeriana</i>	Fanthroated Lizard
9. <i>Mabuya carinata</i>	Common skink
10. <i>Mabuya trivitata</i>	Skink
11. <i>Varanus bengalensis</i>	Common monitor
12. <i>Xenochropis piscator</i>	Checkered keelback
Birds	
1. <i>Podiceps ruficollis</i>	Little Grebe
2. <i>Phalacrocorax niger</i>	Little Cormorant
3. <i>Anhinga rufa</i>	Darter or Snake-bird
4. <i>Ardea cinerea</i>	Grey Heron
5. <i>Ardea purpurea</i>	Purple Heron
6. <i>Ardeola grayii</i>	Pond Heron or Paddy bird
7. <i>Bubulcus ibis</i>	Cattle Egret
8. <i>Egretta garzetta</i>	Little Egret

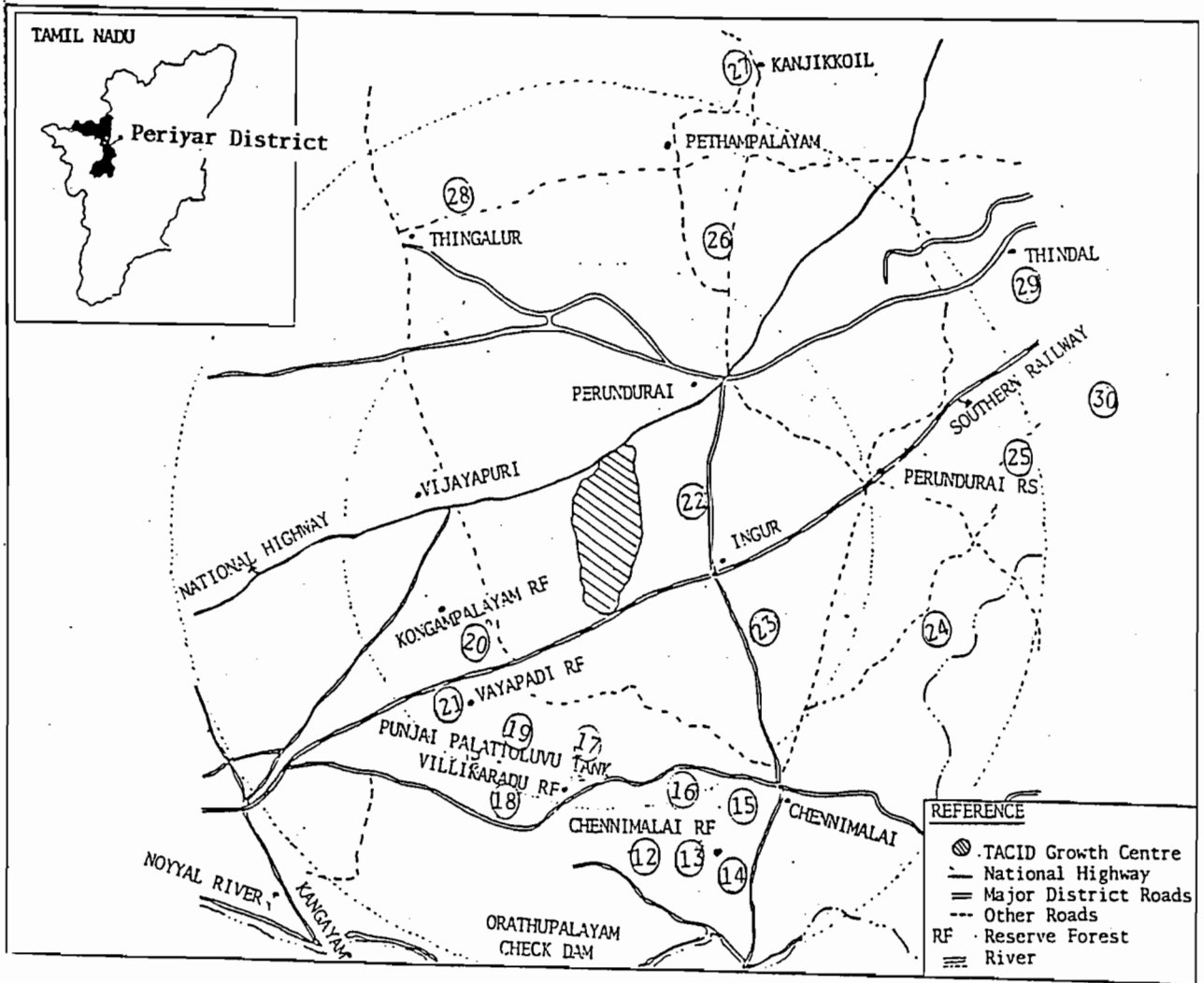
Scientific name	Common Name
9. <i>Nycticorax nycticorax</i>	Night Heron
10. <i>Threskiornis aethiopica</i>	White Ibis
11. <i>Platalea leucorodia</i>	Spoonbill
12. <i>Nettapus coromandelianus</i>	Cotton Teal
13. <i>Elanus caeruleus</i>	Blackwinged Kite
14. <i>Pernis ptilorhynchus</i>	Honey Buzzard
15. <i>Milvus migrans</i>	Pariah Kite
16. <i>Haliastur indus</i>	Brahminy Kite
17. <i>Accipiter badius</i>	Indian Shikra
18. <i>Francolinus pondicerianus</i>	Grey Partridge
19. <i>Pavo cristatus</i>	Common Peafowl
20. <i>Amauromis phoenicurus</i>	Whitebreasted Waterhen
21. <i>Gallinula chloropus</i>	Indian Moorhen
22. <i>Fulica atra</i>	Coot
23. <i>Hydrophasianus chirurgus</i>	Pheasant-tailed Jacana
24. <i>Vanellus indicus</i>	Redwattled Lapwing
25. <i>Columba livia</i>	Blue Rock Pigeon
26. <i>Streptopelia chinensis</i>	Spotted Dove
27. <i>Streptopelia decaocto</i>	Indian Ring Dove
28. <i>Psittacula krameri</i>	Rose-ringed Parakeet
29. <i>Clamator jacobinus</i>	Pied Crested Cuckoo
30. <i>Cuculus canorus</i>	Cuckoo
31. <i>Eudynamis scolopacea</i>	Koel
32. <i>Rhopodytes viridirostris</i>	Greenbilled Malkoha
33. <i>Centropus sinensis</i>	Crow-Pheasant
34. <i>Athene brama</i>	Spotted Owlet
35. <i>Cypsiurus parvus</i>	Palm Swift
36. <i>Ceryle rudis</i>	Lesser Pied Kingfisher
37. <i>Alcedo atthis</i>	Small Blue Kingfisher
38. <i>Halcyon smymensis</i>	Whitebreasted Kingfisher
39. <i>Merops orientalis</i>	Small Green Bee-eater
40. <i>Coracias benghalensis</i>	Indian Roller
41. <i>Upupa epops</i>	Hoopoe

Scientific name	Common Name
42. <i>Megalaima haemacephala</i>	Crimsonthroated Barbet
43. <i>Dinopium benghalense</i>	Goldenbacked Woodpecker
44. <i>Eremopterix grisea</i>	Ashycrowned Finch Lark
45. <i>Ammomanes phoenicurus</i>	Rufostailed Finchlark
46. <i>Galerida cristata</i>	Crested Lark
47. <i>Alauda gulgula</i>	Skylark
48. <i>Artamus fuscus</i>	Ashy Swallow Shrike
49. <i>Oriolus oriolus</i>	Golden Oriole
50. <i>Dicrurus adsimilis</i>	Black Drongo
51. <i>Dicrurus caerulescens</i>	Whitebellied Drongo
52. <i>Acridotheres tristis</i>	Common Myna
53. <i>Acridotheres ginginianus</i>	Brahminy Myna
54. <i>Dendrocitta vagabunda</i>	Tree Pie
55. <i>Corvus splendens</i>	House Crow
56. <i>Corvus macrorhynchos</i>	Jungle Crow
57. <i>Tephrodomis pondicerianus</i>	Common Wood Shirike
58. <i>Aegithina tiphia</i>	Common Iora
59. <i>Pycnonotus leucogenys</i>	Whitecheeked Bulbul
60. <i>Pycnonotus cafer</i>	Redvented Bulbul
61. <i>Turdoides affinis</i>	White Headed Babbler
62. <i>Prinia socialis</i>	Ashy Wren Warbler
63. <i>Orthotomus sutorius</i>	Tailor Bird
64. <i>Copsychus saularis</i>	Magpie Robin
65. <i>Saxicola caprata</i>	Pied Bush Chat
66. <i>Saxicoloides fulicata</i>	Indian Robin
67. <i>Anthus sp.</i>	Pipit
68. <i>Motacilla caspica</i>	Grey Wagtail
69. <i>Motacilla alba</i>	Pied or White Wagtail
70. <i>Nectarinia zeylonica</i>	Purplerumped Sunbird
71. <i>Nectarinia asiatica</i>	Purple Sunbird
72. <i>Passer domesticus</i>	House Sparrow
73. <i>Petronia xanthocollis</i>	Yellowthroated Sparrow
74. <i>Lonchura striata</i>	White Backed Munia

Scientific name	Common Name
Mammals	
1. <i>Macaca radiata</i>	Bonnet Macaque
2. <i>Felis chaus</i>	Jungle Cat
3. <i>Funambulus palmarum</i>	Palm squirrel
4. <i>Lepus nigricollis</i>	Blacknaped hare

MAP - 1

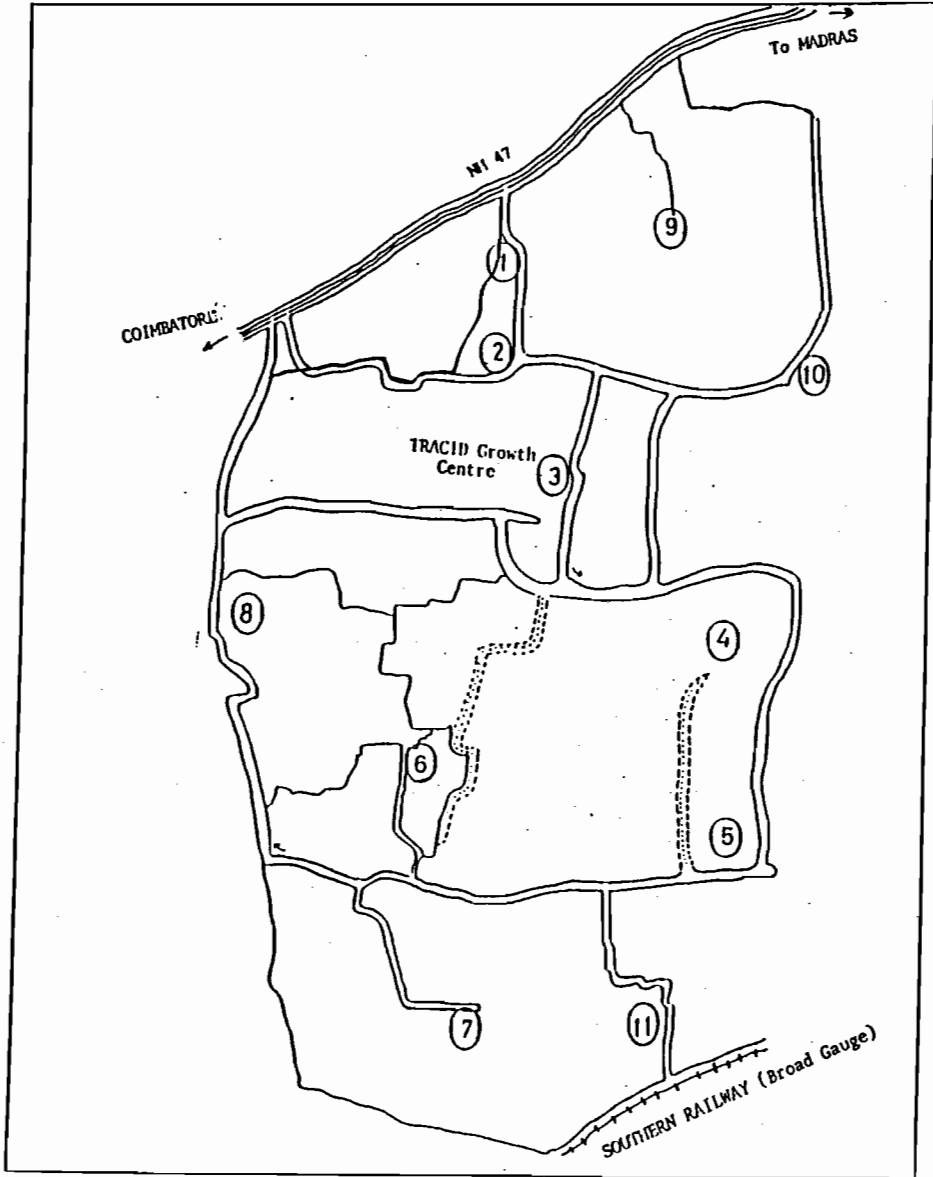
TACID Growth Centre & Surrounding areas (upto 25 kms radius) of Perundurai in Periyar District, Tamil Nadu



12-30: Sampling Plots

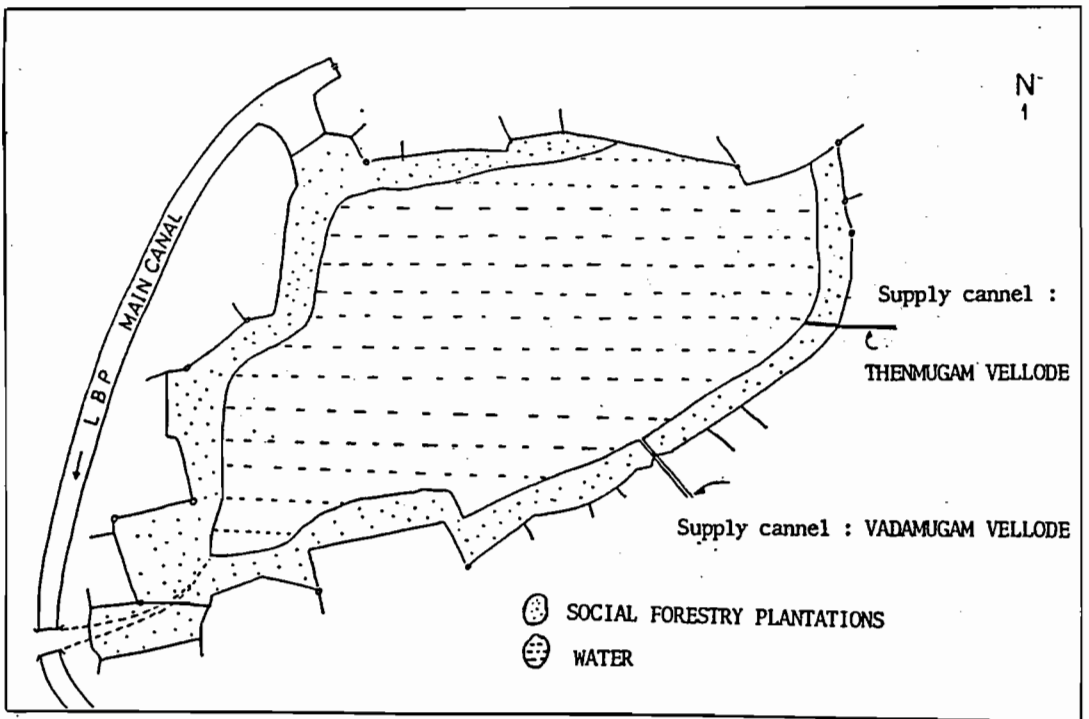
MAP - 2

TACID Growth Centre



1-11: Sampling Plots

MAP - 3
Periakulam, Vellore



ENVIRONMENTAL IMPACT ASSESSMENT OF TACID GROWTH CENTRE, PERUNDURAI, PERIYAR DISTRICT, TAMIL NADU

(RAPID FLORAL AND FAUNAL SURVEY)

INVESTIGATORS

P. A. Azeez
P. Balasubramanian
S. Bhupathy
and
R. Sivakumar



SACON Library



PR10

Salim Ali Centre
For Ornithology & Natural History
Coimbatore, Tamil Nadu

August 1995

Bhupathy